# INVESTIGATING THE RELATIONSHIP BETWEEN PRO-ENVIRONMENTAL BEHAVIOUR AND ENVIRONMENTAL PERFORMANCE THROUGH DEVELOPMENT AND APPLICATION OF A MODEL FOR CATEGORISING ENVIRONMENTAL MANAGEMENT SYSTEM IMPLEMENTATION FACTORS

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## ABBREVIATIONS

| | |
|---|---|
| Afr&WAsia | Africa and West Asia |
| Aus&NZ | Australia and New Zealand |
| CAC | Corporate Affairs Commission (Nigeria) |
| CEE | Collaboration for Environmental Evidence |
| C&SAm | Central and South America |
| DPR | The Department of Petroleum Resources |
| EEA | European Environmental Framework of the European Environmental Agency |
| EGASPIN | Environmental Guidelines and Standards for the Petroleum Industry |
| EMS | Environmental Management System |
| EMAS | Eco Management and Audit Scheme |
| EMSIF | Environmental Management System Implementation Factor |
| ENEC | External Neoclassical Efficient Choice Factor |
| EPI | Environmental Performance Indicator |
| EPIx | Environmental Performance Index |
| ESI | External Social Institutional Factor |
| EU | European Union |
| Eur | Europe |
| FACES | Factors Affecting Corporate Environmental Systems |
| FarE | Far East |
| FEPA | Federal Environmental Protection Agency (Nigeria) |
| FMEnv | Federal Ministry of Environment (Nigeria) |
| HDI | Human Development Index |
| INEC | Internal Neoclassical Efficient Choice Factor |
| ISI | Internal Social Institutional Factor |

| | |
|---|---|
| ISO | International Organisation for Standardization |
| LASEPA | Lagos State Environmental Protection Agency |
| NAm | North America |
| NCF | Nigerian Conservation Foundation |
| NESREA | The Nigerian Environmental Standards Regulatory Agency |
| NC | North Central zone |
| NE | North East zone |
| NW | North West zone |
| PDCA | Plan-Do-Check-Act |
| RSEPA | Rivers State Environmental Protection Agency |
| SA | Social Accountability |
| SE | South East zone |
| SME | Small Medium Enterprise |
| SR | Systematic Review |
| SS | South South zone |
| SW | South West zone |
| UN | United Nations |
| UNCED | United Nations Council for Environment and Development |
| UNEP | United Nations Environment Program |
| USA | United States of America |
| USAID | United States Agency for International Development |
| VSME | Very small medium enterprise |
| WCED | World Commission on Environment and Development |

## GLOSSARY

| | |
|---|---|
| Best Practice | Practices and procedures generally agreed to be efficient and effective and help as a model for others to copy (Dictionary of Business and Management – (Witzel, 1999, p.27). |
| Certification | A formal evaluation of a set of processes. |
| Cleaner Production/Clean Technologies | The use of environmentally friendly processes to produce environmentally friendly products, a route to sustainable development, reducing the risk to the environment of industrial activities in the most cost effective way. The term includes, inter alia, waste minimization, pollution prevention, process modification and energy efficiency (Gilpin, 1997, p.40). |
| Competitive Advantage | Advantage which one competing firm enjoys over its rivals, such as superior products or distribution (Dictionary of Business and Management – (Witzel, 1999, p.55). |
| Command and Control Mechanisms | Command and control consists of two elements: (1) Command – imposed by the regulator as a set of standards or rules e.g. in a permit or set down as offences in law; (2) Control – mechanisms to secure compliance with standards or rules and to enforce the law e.g. fines, penalties, enforcement notices, inspections and audits. |
| Compliance | Obeying a statutory requirement or a legal obligation (Concise Dictionary of Business and Management – (Statt, 1999, p.28). |
| Consultant | Outside specialist brought into a company to advise on or help solve a particular problem (Dictionary of Business and Management – (Witzel, 1999, p.59). |
| Continual Improvement | Recurring process of enhancing the environmental management system in order to achieve improvements in overall environmental performance |

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| | consistent with the organisation's environmental policy (ISO 14001:2004 - Environmental Management Systems – Requirements with Guidance for Use). |
| Corporate | To do with a corporation or organisation. |
| Corporate Organisation | Any company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration. (ISO, 2004). |
| Developing Countries | This refers to the relatively poorer nations of the world, also often referred to as the Third World. Taken as a group the developing nations of the world account for over three-quarters of the world's population (Gilpin, 1997, p.58). |
| Eco-efficiency | The creation of more goods and services with the use of fewer resources (WBCSD, 2000). |
| Eco-design | Sometimes known as 'Design for the Environment', eco-design has been defined as the 'systematic integration of environmental considerations into product and process design (Knight & Jenkins, 2009). |
| Environment | The sum total of external influences acting on an organism (Lawrence, Jackson & Jackson, 1998, p.136). All the surroundings of an organism, including other living things, climate, soil etc. In other words, the conditions for development or growth (Porteous, 1996, p.198).<br><br>A concept which includes all aspects of the surroundings of humanity, affecting individuals and social groupings (Gilpin, 1997, p.74). |
| Environmental Aspect | Element of an organisation's activities or products or services that can interact with the environment (ISO, 2004). |
| Environmental Audit | Audits may be to verify or otherwise comply with environmental requirements, evaluate the effect of existing environmental management |

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|---|---|
| | system, protect the organisation against external criticism, assess risks generally, or assist in planning for future improvements in environmental protection and pollution control (Gilpin, 1997, p.74). |
| Environmental Control Mechanisms | These control mechanisms include but are not limited to (1) Cleaner Production – 'The use of environmentally friendly processes to produce environmentally friendly products, a route to sustainable development, reducing the risk to the environment of industrial activities in the most cost effective way. The term includes, inter alia, waste minimization, pollution prevention, process modification and energy efficiency (Gilpin,1997) |
| Environmental Impact | The changes in the total environment, both in terms of the ecology and the social impact, caused by human activities (Lawrence, Jackson & Jackson, 1998, p.137). |
| Environmental Management | A concept of care applied to localities, regions, catchments, natural resources, areas of high conservation value, cleaner processing and recycling systems, waste handling and disposal, pollution control generally, landscaping and aesthetics, enhancement of amenities. In general it means the efficient administration of environmental policies and standards (Gilpin, 1997, p.80). |
| Environmental Management System | Management system used in environmental management, which generate data used in environmental reporting (Statt, 1999, p.101). |
| Environmental Management System Implementation Factor | Or EMSIF. A component or element of pro-environmental behaviour demonstration. An EMSIF can be a driver, benefit or barrier. |
| EMSIF Categorisation Model | A prototype used for the classification and grouping of EMSIFs |
| Environmental Performance | Measurable results of an organisation's management of its environmental aspects (ISO, 2004). |

| | |
|---|---|
| Environmental Pollution | The contamination of the physical and biological components of the earth/atmosphere system to such an extent that normal environmental processes are adversely affected (Kemp, 1998, p.129). |
| Environmental Regulation | The control of environmental activities through the use of regulatory tools. |
| Implementation | Putting a plan or concept into practice; carrying out a plan (Witzel, 1999, p.144). |
| Industry | A particular sector where companies are involved in broadly similar business, such as the mining industry, the pharmaceutical industry and so on (Witzel, 1999, p.149). |
| International Standard | Standards developed by standards organisations worldwide. |
| Life Cycle Analysis/Assessment | A method for evaluating the whole life of a product, that is all the stages involved, such as raw material acquisition, manufacturing, distribution and retail, use and re-use and maintenance, recycling and waste management, in order to create less environmentally harmful products (Porteous, 1996, p.328). |
| Management | General term for the coordination and direction of resources, capital and labor to ensure the organisation meets its goals; also used to refer to the body of managers and executives responsible for management (Witzel, 1999, p.184). |
| Market | Geographical of other defined area in which there exist a number of potential customers for a product or service or the sum of potential demand for a product or service (Witzel, 1999, p.189). |
| Market demand | Total or potential demand for a product within a particular market (Witzel 1999, p.189). |
| Organisation | Any structured system, including a hierarchy of authority, chain of |

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| | command and responsibility, and definition of particular roles and tasks (Witzel, 1999, p.221). |
| PDCA | Plan-DoCheck-Act is an iterative four-step management method used in business for the control and continuous improvement of processes and product. The PDCA cycle had its origins with Dr. W Edwards Deming's lecture in Japan in 1950 (Moen & Norman, 2011). Deming is considered to be the father of modern quality control. |
| Pollution | Any direct or indirect alteration of the physical, chemical, biological, thermal or radioactive properties of any part of the environment by discharging, emitting or depositing wastes or substances so as to affect any beneficial use adversely (Gilpin, 1997, p.177). |
| Pollution Control | The term for administrative mechanisms for control and the various technical processes and devices available for reducing emissions of waste streams (Porteous, 1996, p.430). |
| Pro-environmental Behaviour | Behaviour in the interest of environmental preservation and protection. |
| Pro-environmental Driver | A factor that motivates an organisation to act in the interest of environmental preservation and protection. |
| Pro-environmental Benefit | A benefit derived by an organisation for an action taken in the interest of environmental preservation and protection. |
| Pro-environmental Barrier | A factor that prevents an organisation from acting in the interest of environmental preservation and protection. |
| Regulator/Regulatory Body | An institution or agency making, upholding and enforcing environmental regulations, laws and stipulations. |
| Regulatory Compliance | Conformity to environmental regulations, laws and stipulations. |

| | |
|---|---|
| Standard | Norm or behaviour to which people are expected to adhere; the level of quality required in a product or service (Witzel, 1999, p.290). |
| Standardization | The elimination of variance (Witzel, 1999, p.291). |
| Supplier | Company or individual supplying materials, goods or services to another company (Witzel, 1999, p.298). |
| Sustainable Development | Development that provides economic, social and environmental benefits in the long term, having regard to the needs of living and future generations (Gilpin, 1997, p.206). |
| Waste Minimization | An approach to waste management that emphasizes the minimization of wastes at source (Gilpin, 1997, p.228). |

## ABSTRACT

Country specificities, national cultures and socio-economic contexts have been found to influence factors influencing pro-environmental behaviour in organisations (Darnall et al., 2008). Different categorisation models have been used to describe these factors (Tomer, 1992; Powell and DiMaggio, 1991; Bansal & Howard, 1997; Jiang & Bansal, 2003; Neumayer & Perkins, 2005; Gavronski et al., 2008; Matzsuzak & Flejsman, 2008; Heras & Arana, 2010; Zorpas, 2010 Curkovic & Sroufe, 2011). Though commonalities exist between models, differences in model structure and terminology have created variations in interpretation of factors, and introduced repetition and disparity in description. The uneven distribution of studies across world regions also limits the applicability of factors. A better representation of research studies and the development of a more efficient categorisation model will lead to a clearer description of factors influencing pro-environmental behaviour.

Organisations adopt pro-environmental behaviour to bring about a change (improvement) in environmental performance. However, there is little consensus about the meaning of environmental performance (Perotto et al., 2007; Casadesus et al., 2008; Comoglio & Botta, 2011), indicating that organisations may interpret it differently and use inappropriate indices for measuring performance. A lack of understanding (or variations in understanding) of the intended outcome of pro-environmental behaviour creates further difficulty in the description and interpretation of factors influencing it. Studies focusing on investigating and describing organisations' interpretation of environmental performance are rare. There is need for a better knowledge of organisations' interpretation of environmental performance and a determination of the indicators used to measure performance.

The aim of this study is to critically evaluate factors affecting pro-environmental behaviour and to investigate environmental performance as its intended result. The study focuses on EMS implementation as a case study of pro-environmental behaviour, so factors influencing pro-environmental behaviour are referred to as environmental management system implementation factors (EMSIFs). EMSIFs were identified and analysed, using a model developed as part of this research work (the Factors Affecting Corporate Environmental Management Systems model).

Questionnaire responses from 200 organisational respondents in the developing country setting of Nigeria were collated, and the FACES model was used to analyse and describe EMSIFs. In order to determine trends in organisational pro-environmental behaviour, identified EMSIFs were compared with those reported in previous studies. Results showed that EMSIFs influencing pro-environmental behaviour differed in organisations in different geographical and economic world regions.

Organisational respondents' views on environmental performance were also identified. Results revealed that organisations had differing views of environmental performance. However, these differences we found not to be reflected in the selection and use of indicators for measuring environmental performance. Further results are analysed and discussed within the thesis.

# CHAPTER ONE

# RESEARCH BACKGROUND

## 1.1 Introduction

The adoption of pro-environmental behaviours by organisations has led to an increasing number of studies focusing on the factors i.e. the drivers, benefits and barriers that influence this behaviour across organisations in a range of industry sectors and world regions (Bansal & Bogner, 2002; Boiral, 2011; Delmas, 2002; Heras & Arana, 2010; Kehbila, 2009; Massoud, Fayad, El-Fadel & Kamleh, 2010a; Nawrocka & Parker, 2008; Zorpas, 2010; Zutshi & Sohal, 2004a).

Studies reporting on factors influencing pro-environmental behaviour use different models to describe and categorise these behaviours, introducing variations in terminology, interpretation and functionality. Though commonalities exist between models, there are differences in terminologies used to describe these factors, as well as differences in organisation types, geographic locations and economic realities in which studies are done. This creates disparity and limits the categorisation, description and usefulness of these factors (Darnall, Henriques, Sadorsky, 2008). It is anticipated that an inclusive categorisation model with common terminologies would facilitate research on factors influencing pro-environmental behaviour, by enabling analysis and comparison across geographical, economic and industry boundaries.

Organisations have different motivations for exhibiting pro-environmental behaviours like environmental management system (EMS) implementation. This includes, but is not limited an attempt to control environmental impacts (Bansal & Bogner, 2002). In general, organisations are motivated by performance and are likely adopt pro-environmental behaviour in order to improve environmental performance (Casadesus et al., 2008; Comoglio & Botta, 2011). It can be said that organisations demonstrate pro-environmental behaviour, such as EMS implementation because they want to gain an improvement in environmental performance.

Studies on factors influencing pro-environmental behaviour reinforce that organisations that invest time and resources in demonstrating these behaviours do so as a result of actual or

perceived benefits, and therefore expect to experience returns on investment (Cashore, van Kooten, Vertinsky, Auld & Affolderbach, 2005; Gavronski, Ferrer & Paiva, 2008; Heras-Saizabitoria, Arana-Landin & Molina-Azorin, 2011). As such, the motivations for pro-environmental behaviour and its expected benefits are linked, indicating that an organisation's pro-environmental behaviour is linked to its expected environmental performance, and is an indication of benefits accruing from its actions (Zutshi & Sohal, 2004a; Gavronski et al., 2008).

However, there have been few studies specifically focusing on causality between drivers, benefits, outcomes and pro-environmental behaviour (Gavronski et al., 2008; Hertin, Berkhout, Wagner & Tyteca, 2008; Nawrocka and Parker, 2008). The results of these studies have been inconclusive, making causal relationships difficult to establish. Subsequently, there is an increasing interest in improving the understanding of pro-environmental behaviours by establishing their actual impact on organisational outcomes. Research interest also lies in determining if pro-environmental demonstration brings about changes in environmental performance (Lopez-Fernandez and Serrano-Bedia, 2007; Hertin et al., 2008; Heras & Arana, 2010).

Environmental performance is a complex and multidimensional issue, and determining changes in performance (improvement) is difficult as a result. This is particularly true because different organisations have differing operations and regulatory environments, and each has inherent measures and values of performance (Bellesi et al., 2005; Hertin et al., 2008). Environmental performance may also be difficult to understand and determine if is interpreted differently by organisations. Results of studies, such as Hamschmidt (2000), indicate that organisations' interpretation of environmental performance is influenced by their original motivations for adopting pro-environmental behaviour. Environmental performance may therefore only be completely defined in the light of individual organisations' motivations, be they purely 'environmental' or not. Continued investigation of causality between drivers, outcomes and environmental performance is necessary. Interpretation of results based on the investigation of causal relationships should be undertaken taking individual organisational views on environmental performance into consideration.

Moreover, related studies have been typically focused on or carried out in organisations based in developed or emerging economies, restricting the widespread relevance of findings (Hertin et al.,

2008). Studies on factors influencing pro-environmental behaviour such as EMS implementation in different countries have shown recognizable differences when compared (Jabbour, Maria da Silva, Paiva & Almada-Santos, 2012), increasing the likelihood of notable variations between results of studies conducted in different world regions. This is true when comparing studies from regions/countries with different cultures and socio-economic status. For instance, according to Delmas, (2002), certain EMS barriers are likely to be more prevalent in developing economies which often lack a regulatory and economic environment conducive to promoting implementation. Conversely, pro-environmental behaviour may yield immediate benefits (such as short term improved environmental quality) in the same developing economies where environmental problems are serious and government intervention is minimal, giving organisations a greater responsibility to effect environmental change.

Organisations, especially those with operations across a number of world regions, would benefit from understanding the link between pro-environmental behaviour and its outcomes as it is affected by different geographical factors (Paulraj & deJong, 2011). Such studies will facilitate the critical evaluation of pro-environmental behaviour across geographical regions and aids the comparison of research results with those of similar studies conducted in other regions. A deepened understanding of factors influencing pro-environmental behaviour categories will also aid policymakers in the formulation of policies which could provide the enabling conditions for fostering pro-environmental behaviours (Njoku and Orabuchi, 2010).

## 1.2 Research aims and objectives

The aim of this study is to critically evaluate factors affecting pro-environmental behaviour and to investigate environmental performance as its intended result. The factors affecting pro-environmental behaviour are broadly referred to as environmental management system implementation factors (EMSIFs) because, within this thesis, EMS implementation is used as a case study of pro-environmental behaviour. Data collection is situated in a developing country setting, to address the relatively lower numbers of such studies that have been conducted in developing regions. In order to achieve its aim, this PhD research has the following objectives:

1. To develop a new model for the categorisation of factors affecting pro-environmental behaviour (EMSIFs) across geographical and economic boundaries;
2. To apply, test and critically evaluate the newly developed model by comparing it with existing models for categorising EMSIFs;
3. To identify factors affecting pro-environmental behaviour (EMSIFs) in a developing country context, and to categorise and analyse them using the developed model;
4. To determine patterns in pro-environmental behaviour by exploring the relationship between organisational characteristics and EMSIFs;
5. To identify geographic and economic patterns in pro-environmental behaviour by comparing EMSIFs identified from this research with EMSIFs identified by previous studies in other world regions;
6. To identify organisational views on environmental performance and critically analyse perceptions of environmental performance in a developing country context;
7. To identify and analyse objective means for measuring environmental performance, by determining environmental performance indicators in use by organisations in a developing country context, and by analyzing patterns in the use of environmental performance indicators;
8. To critically evaluate the extent to which environmental performance indicators being measured by organisations are suitable for measuring environmental performance (as it is perceived by organisations).

## 1.3 Structure of the thesis

The structure and logical organisation of this thesis is depicted both in Table 1.1 and Figure 1.1.

Research objectives have been addressed within four (4) separate but interrelated chapters. Table 1.1 shows how specific objectives are addressed in each research chapter. Figure 1.1 shows an overview of the research structure of this thesis and depicts that specific objectives are addressed through each research chapter, with the conclusions of each chapter culminating in the final discussion, conclusion and recommendations.

A new categorisation model for EMSIF classification is presented within Chapter 4. The chapter critically reviews the main EMSIF classification divides and groups that have been presented in previous literature, and uses this review to inform the development of a new model. The new model's ability to successfully categorise a broad range of EMSIFs was tested by comparing it with other models, using EMSIFs reported from studies conducted in other world regions (Europe, North, Central and South America, Australia/New Zealand, Asia and the Far East).

In Chapter 5 the identification (through a structured survey method) of EMSIFs in organisations within the developing country context of Nigeria is presented. Categorisation and analysis of identified EMSIFs was done using the newly developed model. EMSIFs from this research were compared with those identified by previous studies in other world regions (Europe, North, Central and South America, Australia/New Zealand, Asia and the Far East).

Chapter 6 addresses environmental performance as being the major expected outcome of organisational pro-environmental behaviour. This chapter identifies and analyses organisational respondents' perceptions of environmental performance by identifying individual organisational views. Respondent views were analysed, using qualitative data analysis methods, to identify major themes in the interpretation of environmental performance.

Chapter 7 addresses the measurement of environmental performance by identifying objective means for measurement (environmental performance indicators or EPIs) used by organisations in Nigeria. Patterns in EPI use in respondent organisations were analysed and relationships between organisational characteristics and EPI use were identified. The appropriateness of EPIs being measured by organisations for assessing environmental performance (in particular as is perceived by respondent organisations) is discussed in this chapter.

The findings and conclusions of each research chapter culminate in overarching conclusions, presented in Chapter 8 – Synthesis of Findings and Summary. The information in research chapters is supported by contents of the general chapters of this thesis – Chapter 1 – Introduction and Research Objectives; Chapter 2 – General Review of Literature and Research Gaps; Chapter 3 – Methodological Approach and Research Methods; Chapter 8 – Synthesis of Findings and Summary; Chapter 9 – Contributions to Knowledge, Research Beneficiaries, Recommendations and Further Research, and; Chapter 10 - Conclusion.

*Table 1.1 – Alignment of research objectives with thesis chapters*

| Research Chapters | Research Objectives |
|---|---|
| **Chapter Four** | To develop a new model for the categorisation of factors affecting pro-environmental behaviour (EMSIFs) across geographical and economic boundaries; |
| | To apply, test and critically evaluate the newly developed model by comparing it with existing models for categorising EMSIFs; |
| **Chapter Five** | To identify factors affecting pro-environmental behaviour (EMSIFs) in a developing country context, and to categorise and analyse them using the developed model; |
| | To determine patterns in pro-environmental behaviour by exploring the relationship between organisational characteristics and EMSIFs; |
| | To identify geographic and economic patterns in pro-environmental behaviour by comparing EMSIFs identified from this research with EMSIFs identified by previous studies in other world regions; |
| **Chapter Six** | To identify organisational views on environmental performance and critically analyse perceptions of environmental performance in a developing country context; |
| **Chapter Seven** | To identify and analyse objective means for measuring environmental performance, by determining environmental performance indicators in use by organisations in a developing country context, and by analyzing patterns in the use of environmental performance indicators; |
| | To critically evaluate the extent to which environmental performance indicators being measured by organisations are suitable for measuring environmental performance (as it is perceived by organisations). |

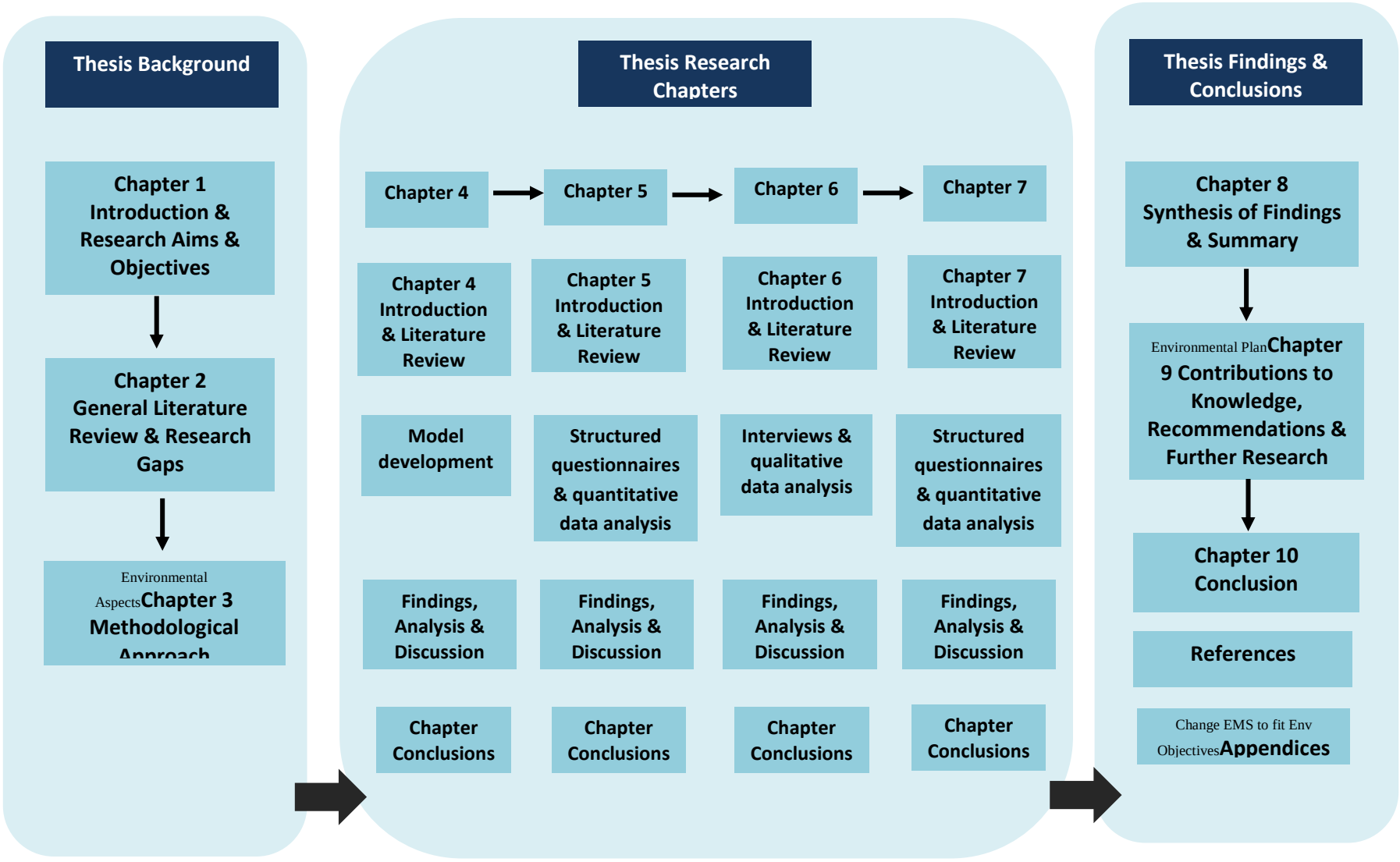



*Figure 1.1 – Thesis structure*

# CHAPTER TWO

# GENERAL REVIEW OF THE LITERATURE

## 2.1 Introduction

The environmental impact of human activities only began receiving substantial attention in the 1970s. Environmental issues have subsequently received increasing consideration in corporate management and decision making internationally (Quazi, Khoo, Tan & Wong, 2001). A philosophy underpinning environmental concerns is that of the concept of sustainable development – the idea that consumption and development can only be 'sustainable' if they meet the needs (material, resource, energy) of the present generation whilst ensuring that the needs of future generations can also be met. This was the position of the Brundtland Report titled "Our Common Future" published by the World Commission on Environment and Development (WCED, also popularly called the Brundtland Commission). The WCED was created by the United Nations General Assembly in 1983 for the purpose of examining conflicts between environmental protection and economic growth, and developing strategies for their reconciliation. The sustainable development stance places pressure on organisations, as being the most obvious and therefore readily culpable perpetrators of resource mismanagement and environmental decline. Pivotal publications from the WCED and the United Nations Council on Environment and Development (UNCED), to the United Nations Conference on Sustainable Development (popularly called Rio 20+) highlight the role of industry in the pursuit of sustainable development and the need for industry to be accountable for its adverse environmental impacts (UNCED, 1992; UNCED, 2012; WCED, 1987).

Studies have shown that societal respondents in both developed and developing countries consider environmental protection to be a greater concern than economic growth and progress. For instance, in a study by Quazi et al. (2001), top company executives of respondent organisations were said to generally believe that environmental issues played a central role in business in the 21$^{st}$ century. This indicates the importance placed on environmental issues in the course of economic development. Paradigm shifts in perceptions of the natural environment have necessitated the viewing of the traditionally upheld values of economic

advancement in a different light – that of environmental protection and preservation (Alemagi, Oben & Ertel, 2006; Quazi et al., 2001).

## 2.2 Managing the environment in organisations

The concern for the natural environment has led to an increasing interest in the way organisations manage environmental issues (Bansal & Bogner, 2002; Oliveira et al., 2010).As such, organisations operating worldwide are increasingly being held accountable for their actions, especially as a result of their direct connection with activities that could lead to negative environmental impacts. According to Henri & Journeault (2008), this conferred accountability is evidenced by the on-going development of environmental laws, regulations and repercussions put into effect by governments and regulatory bodies, together with the various innovative forms of formal and informal environmental control mechanisms in use within industry worldwide.

Organisations are now expected, as a matter of course, to assess, control and even publicly disclose information relating to their environmental interactions. Those organisations that do not take careful account of and subsequently manage the impact of their products and services on the environment may become unpopular or irrelevant in their respective markets (Babakri, Bennet & Franchetti, 2003; Bansal & Bogner, 2002; Bellesi, Lehrer & Tal, 2005; Darnall et al., 2008; Franchetti, 2011; Gonzalez-Benito & Gonzalez-Benito, 2008; Nawrocker & Parker, 2008, Nishitani, 2010; Oliveira et al., 2010; Quazi et al., 2001; Rao, la O'Castillo, Intal & Sajid et al., 2006; Tam, 2006; Zorpas, 2010). According to Nishitani (2010), the continued survival of the corporate organisation is linked to its on-going consideration of the natural environment surrounding company operations.

The urgency with which environmental issues are being considered has placed pressure on organisations to evolve innovative ways in which the issue of the environment can be effectively managed within their operations. This has obviously led to the evolution of a number of methods for identifying, analyzing, controlling and minimizing unwanted environmental impacts which may occur as a result of organisational activities (Gavronksi et al., 2008; Gonzalez et al., 2008). Environmental control methods in use by organisations have

been both formal and informal, and appear to be internally or externally motivated. Though corporate environmental protection and control maybe a recognized need, the degree of sincerity with which environmental issues are managed within organisations, and their motivations for doing so remains an issue for concern to stakeholders (Gavronksi et al., 2008; Gonzalez et al., 2008).

## 2.3 Environmental management and performance through EMSs

A term that has been increasingly used in the past two decades, and which has evolved with the advent of environment concern is 'environmental management'. Environmental management refers to the disciplined approach by which organisations ensure that their processes and operations have a minimal (or even positive) impact on the environment (Paulraj & de Jong, 2011). The term encompasses the application of innovative systems and tools throughout an organisation, with the aim of increasing environmental sustainability while increasing competitive advantage and improving organisational social standing. This is achieved through managing a system of on-going organisational learning and knowledge enhancement, and is guided by the setting and attainment of objective environmental goals and targets (Jabbour et al., 2012). Such systems are referred to as environmental management systems or EMSs. Environmental management works much like the mechanism for any other organisational function, such as operations, human resources and finance management, where resources are pooled together to control intended aspects and achieve planned results.

Environmental management by organisations is primarily geared at improving environmental performance (Webb, Chilvers & Keeble, 2006). A basic definition of environmental performance is 'the measurable result of an organisation's management of its environmental aspects' (ISO, 2004). A more detailed definition given by Reis (1995) and Tibor & Feldman (1996) is that environmental performance is the 'training period undertaken by an organisation in the treatment of the relations among all aspects of its activities ……. risks and significant environmental effects, and consists of obtaining measurable results from the managerial environmental aspects of activities, products and services'. However, there has been no agreement amongst studies as to whether organized environmental management actually brings about an improvement in environmental performance. Webb et al (2006) report on two

categories of studies which attempt to prove relationships between EMSs and environmental performance. One category concludes that EMSs do improve environmental performance (Sroufe, 2003; Hamschmidt, 2000; Potoski and Prakash, 2005 & Andrews et al., 2003), and the other category does not (Hertin et al., 2004 & King and Lenox, 2000). This leaves an unestablished relationship between pro-environmental behaviours such as EMS implementation, and environmental performance. A lack of understanding or agreement on the intended outcome of pro-environmental behaviour (environmental performance improvement) creates a challenge for organisations with regards to performance measurement and assessment.

Effective environmental management, because it creates viable advantages for many organisations, is considered an important competitive priority for them (Jimenez & Lorente, 2001). Effective management signifies proactivity in the handling of environmental issues. This is of particular importance to organisations as they become increasingly aware that environmental proactivity may contribute to the reduction of unwanted accidents and simultaneously improve economic bottom lines (Quazi et al., 2001).

That some organisations consider environmental management to be a competitive priority indicates that their motivation for managing the environment may not stem solely from a concern for the preservation of nature. There are different opinions on this premise, as not all organisations consider corporate environmental management an advantage. For instance, an excessive emphasis on environmental issues may present a deterrent to pro-environmental behaviour, as the direct focus of environmental management initiatives on prevention and eco-efficiency may also prevent it from being viewed as a competitive priority for some organisations (Jabbour et al., 2012). It may also be that some organisations feel that their focus on environmental management distracts them from their core business objective of profit-making. These opposing positions appear to be simultaneously held by different organisations to differing degrees.

The degree of competitive advantage an organisation can derive from the propagation and use of environmental management tools is, to some extent, dependent on the reasons behind the implementation of different environmental strategies. Consequently, the use of environmental management tools may bring about different results in organisations' operations. Deployment

of these tools may then bring about differing levels of environmental performance. Though there are disagreements on the degree of actual competitive advantage that may be gained, the concept of environmental management still appears to have received widespread acceptance, as evidenced by the continued and increasing adoption of certified and non-certified EMSs by organisations worldwide (ISO, 2013). The environmental management concept is most demonstrably detailed in the implementation of the EMS, which formally surfaced in the 1990s as a tool for moving organisations towards the goal of sustainable development (WCED, 1987; ISO, 2004). Management systems in general, generically based on the Deming plan-do-check-act model, represent the organisational structures put in place to control the process of transforming company resources into product or service outputs, in order to achieve internal or external company objectives (ISO, 2004). Management systems may be focused on any aspect of company operations and aim to plan, organize and control related elements of a particular aspect to produce pre-determined outcomes which are usually articulated as specific goals and objectives.

Aptly defined by Bellesi et al. (2005, p.1945) as "a set of internal rules that managers use to standardize behaviour in order to help satisfy organisation's environmental goals", an EMS is a subset of an organisation's larger management system. It comprises human, economic and infrastructural components which control the environmental interactions brought about by company activities, products and services, and which harness the organisation's capabilities for achieving set environmental objectives (Chan & Hawkins, 2010; Link & Naveh, 2006; Yin & Schmeidler, 2009; Zorpas, 2010). Though EMSs by their structure are designed to provide advantageous value to organisations, there is some debate about the value that they offer (Bansal & Bogner 2002; Babakri et al., 2004). This raises a pertinent issue about whether environment management tools such as EMSs actually affect organisations positively.

## 2.4 Levels of environmental management

Webb et al (2006) present a framework explaining that organisations operate at different levels of environmental management. This framework has seven levels, which group organisations into stratified levels of environmental management, ranging from having an

externally recognized environmental certification (such as EMAS or ISO 14001) to having no system of managing environmental issues at all. The first of the seven levels represents organisations which have been certified to the Eco Management and Audit Scheme (EMAS) standard. It is not clear why the Webb et al (2006) framework rates EMAS certified organisations on a higher level of environmental management than ISO 14001 certified organisations. This may be because EMAS is generally considered to place more stringent requirements, such as environmental reporting on certifying organisations. The second level represents organisations which have been externally certified to the ISO 14001 standard, but which also show additional voluntary displays of pro-environmental behaviour. The third level represents organisations that have been externally certified to the ISO 14001 standard, and the fourth level represents organisations that claim adherence to the ISO 14001 standard, although having no certification. The fifth level represents organisations with an EMS that is recognized geographically and also by their industry sector, and the sixth level represents organisations that operate some elements of an EMS. The seventh level represents organisations with no EMS at all. Figure 2.1 shows the framework presented by Webb et al (2006).

The existence of levels in environmental management in organisations raises the issue of whether there are also corresponding levels in environmental performance i.e. returns on environmental management efforts. Stratified levels of environmental management may imply that organisations also display different levels of pro-environmental behaviour.

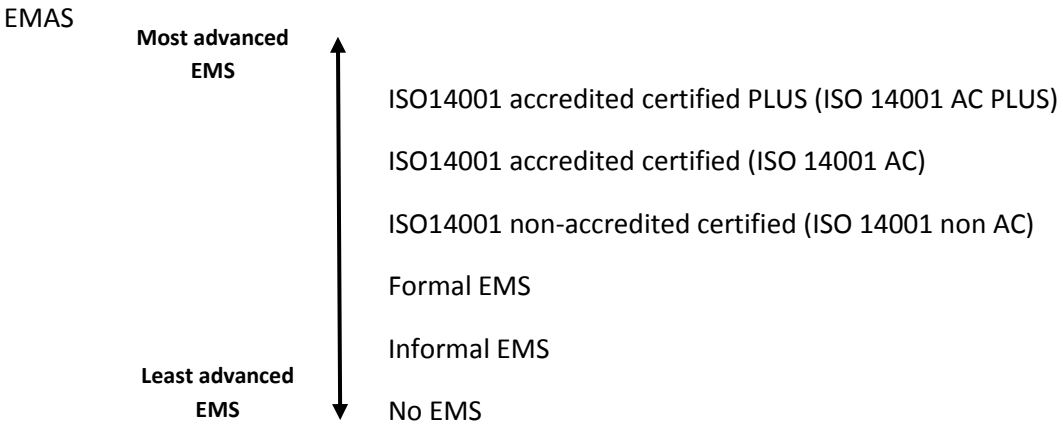



*Figure 2.1 – Levels of environmental management (Adapted from Webb et al., 2006)*

## 2.5 How are EMSs implemented? A focus on ISO 14001

EMS implementation is an important aspect of environmental management and a form of pro-environmental behaviour. A number of studies and publications provide guidance and evaluate EMS implementation from an academic standpoint. The ISO 14001:2004 EMS implementation standard provides a useful foundation for discussing the practicalities of EMS implementation, and establishes the tasks that need to be undertaken (as distinct clauses) to achieve certification. ISO 14001, through a plan-do-check-act (PDCA) framework, details requirements for the setting up of an environmental management system geared at achieving set organisational environmental objectives.

In an attempt to facilitate the ISO 14001 implementation process, various studies have provided models detailing implementation dynamics (Bansal & Bogner, 2002; Boiral, 2011; Brouwer & van Koppen, 2008; Hughey, Tait & O'Connell, 2005; Radonjic & Tominc, 2007). The models presented by these studies are differing yet complementary explanations of the ISO 14001-driven process of developing and implementing an EMS. These models present structured approaches to undertaking EMS tasks, including an alternative configuration of system elements. Different explanations of the EMS implementation as shown by these studies are useful in demonstrating that there is a generic approach towards the implementation of EMSs in organisations. Three of these explanations are elaborated below.

A diagrammatic representation of the first model is shown in Figure 2.2. According to Bansal and Bogner (2002), the ISO 14001 implementation model is based on 5 distinct stages – scoping, planning, implementing, checking and correcting. The scoping stage involves the identification of an organisation's environmental aspects, and the determination of regulatory requirements affecting the organisation. In the planning stage, the organisation designs a plan to manage environmental changes which may occur as a result of its environmental aspects i.e. environmental impacts. The planning stage includes development of an environmental policy, setting objectives and targets, allocating resources and assigning responsibilities, developing procedures for preparing and controlling documentation and adjusting internal processes to meet set environmental objectives and targets. In the implementation stage, the organisation implements its policy and plan by training employees, communicating, creating awareness, implementing operational controls and keeping records and documentation. The

checking stage requires that the control of actual environmental impacts is regularly checked, and non-conformances or deviations from set levels addressed. The final stage involves a regular review by the organisation's management, and the effecting of any necessary changes to continually improve EMS efficiency and the ability of the EMS policy, processes and structures to meet set environmental objectives and targets.

According to Hughey et al (2005) and Radonjic and Tominc (2007), an ISO 14001 EMS is based on the development and implementation of an environmental policy, which should lead the organisation to the identification of the environmental aspects of all its operations, products or services. The organisation should subsequently identify its environmental priorities and set objectives, targets and implementation processes related to its environmental aspects for planning and controlling activities and impacts. These processes are regularly monitored and audited, with the execution of preventive and corrective actions, and the entire system is regularly reviewed to ensure continual improvement. This interpretation of ISO 14001 EMS implementation is shown in the model in Figure 2.3.

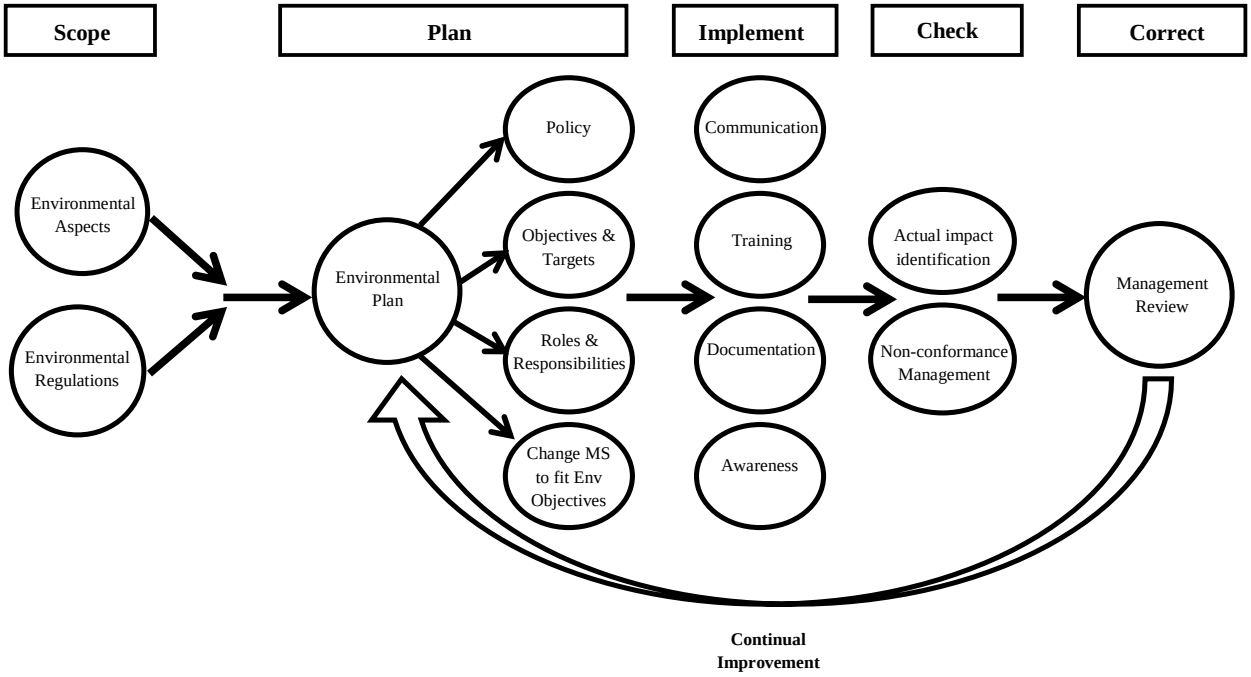



*Figure 2.2 – ISO 14001 EMS implementation model (adapted from: Bansal and Bogner 2002)*

According to a third implementation model explained by Boiral (2011), the ISO 14001 EMS involves planning activities for environmental management, including the setting of objectives and development of plans, the implementation of plans through the use of resources, development of capabilities, allocation of responsibilities and other control processes, the checking of environmental performance through measurement and finally acting by demonstrating management commitment to continually improve the management system. This implementation mode is detailed in Figure 2.4.

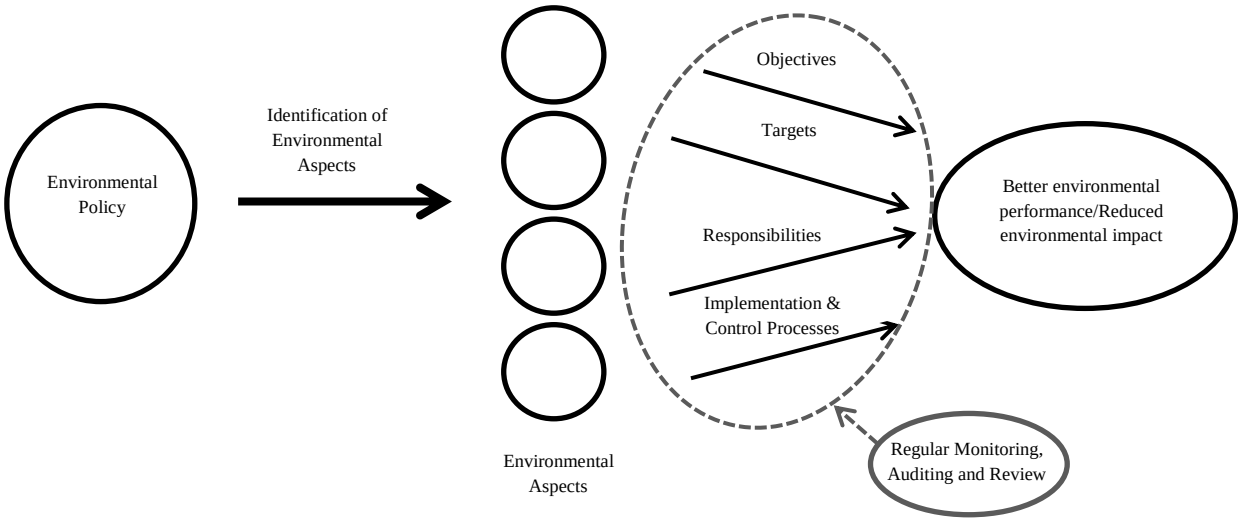



*Figure 2.3 – ISO 14001 EMS implementation model (adapted from: Hughey et al., 2005; Radonjic & Tominc, 2007)*

Though differences exist in the structures of different EMS implementation models, there are similarities between them and they all retain a generic nature. Implementation models propose specific requirements for organisations intending to adopt an EMS but do not explicitly refer to any particular action or impose specific performance or technology standards (Rondinelli & Vastag, 2000). Although EMS models and the ISO 14001 standard achieve greater environmental commitment and a consistent, well-documented EMS, they do not reveal the extent to which organisations have control over environmental impacts, and may not

necessarily bring about a profound environmental revolution of the organisation's operations (Bellesi et al., 2005; Gonzalez-Benito and Gonzalez-Benito; 2008; Lopez-Fernandez & Serrano-Bedia, 2007; Oliveira et al., 2010).

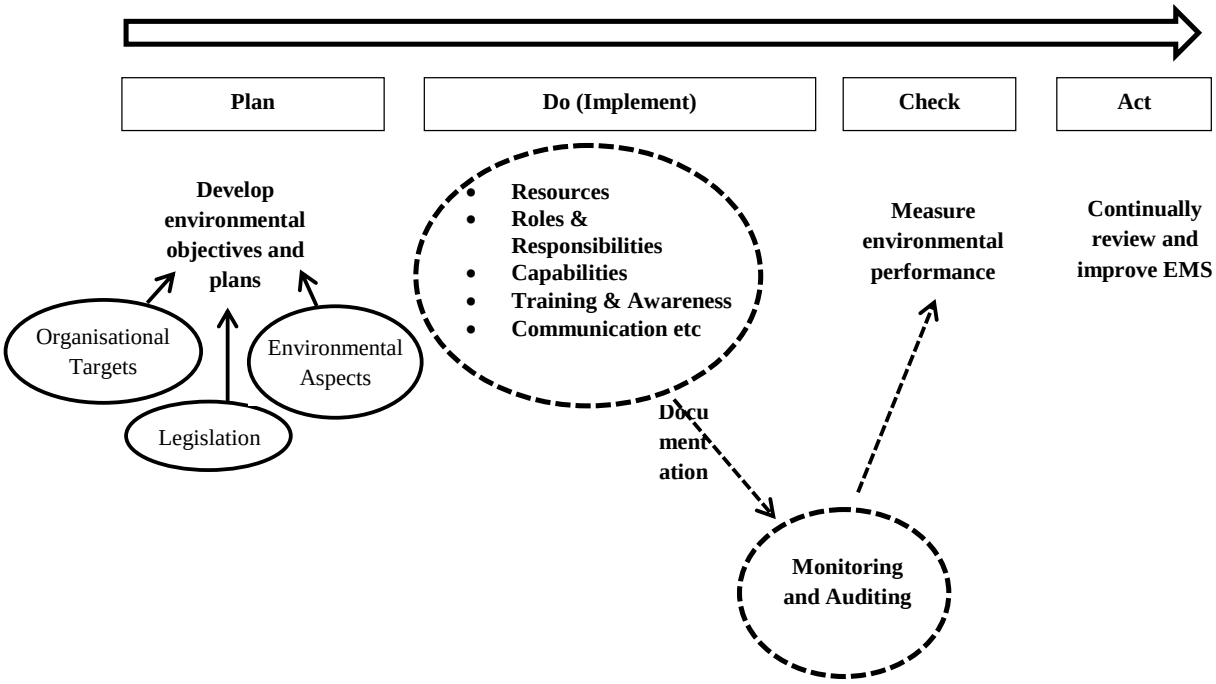



*Figure 2.4 – ISO 14001 EMS implementation model (adapted from: Boiral, 2011)*

EMS implementation models are structured to work within organisations' systems and integrate environmental considerations into the way that operations function. They are intended to improve environmental performance by mitigating, controlling or reducing negative impacts. However it appears that the overriding aim of the ISO 14001 standard is to simply ensure that EMS objectives and programs exist. A reason for this assumption is that there are no explicit environmental performance assessment aspects within the ISO 14001 standard. Determining whether these objectives and programs are sufficient to achieve the organisation's environmental goals and improve performance remains the responsibility of the organisation itself. This makes it difficult to link EMSs with performance and leads to a situation where organisations may be unaware of the actual impact of EMS implementation on their environmental performance. This has been a criticism of many EMS implementation

models. Organisations may wrongly equate external EMS certification with improved environmental performance, leading them to assume that their performance has improved because they have implemented an EMS. Lopez-Fernandez and Serrano-Bedia, (2007) have suggested that commitment to EMS implementation must be maintained over time, if notable environmental improvement is to be achieved. This implies that the mere existence of a formal means of managing environmental impacts does not guarantee improved environmental performance in an organisation.

## 2.6 EMS implementation drivers

***What drives organisations to exhibit pro-environmental behaviour?***

Studies including Darnall et al (2008), Gonzalez, Sarkis & Adenso-Diaz (2008) and Heras & Arana (2010) provide explanations for drivers which motivate organisations toward pro-environmental behaviours. Pro-environmental motivations are interchangeably referred to as 'drivers' or 'incentives' by the studies researching them. According to research, environmental drivers can be categorised into groups of closely related motivating factors (Heras & Arana, 2010). As a large number of drivers are presented by these studies, it is useful to categorise them into related groups. Table 2.1 gives details of driver classification groups as presented by a review of 9 previous EMS studies. Table 2.2 gives details of each study's findings.

*Table 2.1 Environmental driver classification groups*

| Type of driver | Definition |
|---|---|
| The Organisation's Market | Drivers that stem from customers, suppliers and competitors |
| The Organisation's External Social Environment | Drivers that arise from communities and other institutions surrounding the organisation |
| The Organisation's Internal Environment | Drivers that stem from the organisation's need to operate efficiently and improve its performance |
| The Organisation's Regulatory Environment | Drivers coming directly from environmental regulatory agents |
| The Organisation's Environmental Concern/Values | Drivers which stem from an organisation's independent ethical views of environmental preservation, and its desire to take advantage of environmental technology and innovation |

*Table 2.2 – Environmental behaviour driver classification models*

| Research Study | TYPE OF ENVIRONMENTAL DRIVER | | | | |
|---|---|---|---|---|---|
| | **THE ORGANISATION'S MARKET** | **THE EXTERNAL SOCIAL ENVIRONMENT** | **THE INTERNAL ENVIRONMENT** | **THE REGULATORY ENVIRONMENT** | **ENVIRONMENTAL CONCERN/VALUES** |
| **Tomer, 1992** | **Market Incentives** (Economic incentives derived from an organisations products, services, customers and the market) | **Social Influences** (Both broad and direct external social influences which impact on an organisation) | **Internal Organisational Capabilities** (Organisational human capabilities which affect environmental behaviour) | **Regulatory Influences** (Influences which arise from regulators who seek to alter the organisation's behaviour) | **Environmental Opportunities** (Known developments that can improve environmental impact of an organisation) |
| **Bansal & Howard, 1997** | **Market Drivers** (External forces impacting the competitiveness of an organisation) | **Social Drivers** (Includes pressure from various groups, the public and community) | **Financial Drivers** (From financial institutions and insurance companies, and fines/legal liabilities resulting from non-compliance) | **Regulatory Drivers** (Pressure from guidelines and regulations at national/international levels) | |
| **Jiang & Bansal, 2003** | **Market demand** (These arise from the impact of market demand on an organisation) | **Institutional Pressures** (From the social pressures such as regulation and external institutions which affects an organisations behaviour) | **Management Control** (These motivations arise from the control exerted on an organisation by its parent company | - | |
| **Edwards, 2004** | **Commercial Drivers** (Economic-driven control of environmental responsibilities extended to suppliers/ subcontractors ) | - | **Economic Drivers** (Through resource conservation and waste reduction) | **Legal Drivers** (Governments generated laws to control environmental interactions) | **Ethical Drivers** (The human duty to look after and hand over the world in which we live to our children) |
| **Bansal & Roth, 2000** | **Competitive Motives** (These arise from an organisation's search for competitive market advantage) | **Relational Motives** (An organisation's desire to be viewed as 'legitimate', and also to improve its various stakeholder relationships) | - | - | **Ethical Motives** (An organisation's demonstration of environmental responsibility) |
| **Neumayer & Perkins, 2005** | - | **External or Institutional Motives** (Motives related to social pressures exerted externally to persuade an organisation to adopt certain practices) | **Internal Motives** (Motives related to organisational efficiency leading to improvement in performance, productivity and profitability ) | - | - |
| **Darnall et al., 2008** | **Market Pressures** (Pressures from the organisations market compelling it to be environmentally responsible) | **Ownership Pressures** (From the organisations shareholders, who may be interested in investing in environmentally responsibility) | - | **Regulatory Pressures** (Involving the use of legal mandates for organisations to implement environmental control) | - |
| **Heras et al., 2011** | - | **External Motives** (Motives originating externally to the organisation) | **Internal Motives** (Motives originating internally to the organisation) | - | - |
| **Heras & Arana, 2010** | **Customer Demands** (The demands made by the organisations market) | **Company Image** (The desire for a favorable corporate image) | **Desire to improve environmental situation** (A desire to improve environmental impact) | **Legislative Compliance** (The need for the organisation to comply with environmental laws) | **Other External factors** (E.g. pressures from external administrative bodies) |

## 2.7 What do EMSs offer organisations?

Despite the fact that the link between EMSs and environmental performance remains unclear, there appears to be a general consensus from previously published research that EMSs offer value, and a number of studies have elaborated the usefulness of EMSs as a means of effective environmental management for organisations (Bansal & Bogner, 2002; Boiral, 2011; Curkovic & Sroufe, 2005).

EMSs help to actualize and implement an environmental policy and specific objectives, as well as effectively managing organisational elements which interact with the natural environment, in other words, environmental aspects (Perotto, Canziani, Marchesi & Butelli, 2008). EMSs act as an additional assurance for stakeholders, both internal and external, reflecting: that environmental policies, objectives and stakeholder expectations are being addressed; that regulatory compliance is an integral part of business operations; that emphasis is placed on preventing rather than curing potential environmental damage; and that there is a systematic approach to supporting and ensuring continual improvement in environmental profitability performances.

Implementing EMSs effectively transforms a company's approach to the environment from being a traditionally reactive, ad-hoc and end-of-pipe one to a more proactive and forward looking approach, which integrates the precautionary and polluter pays principles into operations (Curkovic & Sroufe, 2011; Massoud et al., 2010a). The pollution prevention objective of EMSs produces mechanisms within the organisation for reducing resource consumption (Matuszak-Flejsman, 2009). These outputs of EMS implementation are closely linked to organisational performance and are therefore likely to have a degree of impact on environmental performance. However, the existence of a direct, consistent and positive impact on environmental performance has not been undisputedly proven.

EMSs are also an important means by which the organisation can comply with relevant environmental legislation, and bring environmental issues to the fore internally while simultaneously responding to surrounding pressures from external stakeholders and bolstering company image. EMSs therefore provide an organized and strategic method of diffusing environmental concern throughout an entire organisation. Well implemented EMSs enable

organisations to systematically evaluate internal processes and activities with regards to interactions with the environment (Matuszak-Flejsman, 2009; Massoud, Fayad, Kamleh & El-Fadel, 2010b; Perotto et al., 2008; Sambasivan & Fei, 2008).

Many aspects of EMS implementation, especially system verification/certification are obvious, outward demonstrations of environmental stewardship, readily observable by interested external parties. The focus on EMSs affords organisations not only the benefits that may be gained by managing environmental impacts but also the public exposure and confidence that they are paying attention to an issue of widespread concern. However, not all stakeholders either understand or demonstrate interest in the theoretical details of an organisation's environmental effort. Non-technical stakeholders such as surrounding communities in particular, may weigh environmental effort by the direct impact made on specific environmental problems they face as a result of organisations' operations. This may be especially true when organisations are operating in areas where the public's level of literacy is low, such as in many developing countries. In this instance, the organisation will only be viewed favorably if the specific environmental problem is resolved, and this is dependent on the public's level of understanding of that problem. Attempting to manage public opinion makes it even more difficult for organisations to focus solely on the environmental performance improvement potential of EMSs. The issue of publicizing environmental efforts is apparent in the case of organisations certified to EMS standards such as ISO 14001:2004, which requires the public availability of the organisation's environmental policy. Although the environmental policy details organisational environmental management intents, the public aspect of EMS implementation can lead organisations to become distracted from achieving the intended objective of displaying pro-environmental behaviour, which is the improvement of environmental performance.

## 2.8 EMS implementation benefits

### *What do organisations gain from implementing EMSs?*

EMS implementation provides many benefits referred to as 'common benefits', including process standardization, improved use of natural resources, avoidance of environmental

impacts, increased efficiency/reduced costs, raising employee awareness, compliance with legislation, improved competitiveness, improving in-house practices based on recognized management principles, better management control, promoting social legitimacy and improving integration between environmental issues and organisational performance (Bansal & Bogner, 2002; Boiral, 2011; Gavronski et al., 2008; Massoud et al., 2011; Zorpas, 2010).

Furthermore, EMS implementation has also been found to bring about less common, more situation-dependent benefits such as improving sustainability in supply chains, enabling organisational response to specific external pressures, reducing solid waste in operations, increasing the attractiveness of an organisation to investors, enabling technological innovation, improving employee safety protection, and enabling better preventive maintenance of equipment (Boiral, 2011; Curkovic & Sroufe, 2011; Franchetti, 2011; Oliveira et al., 2010).

However, there is disagreement on the existence of benefits resulting from EMS implementation. This may be because the results of EMS studies have continually provided divergent findings making it difficult to determine the actual impact, whether positive or negative, of EMS implementation on an organisation. For instance, studies have reported results demonstrating that implementing EMSs has produced tangible results for implementers, while others strongly contradict this position, reporting that implementation has produced no change, or in some cases, negative change. This divergence of findings has resulted in the continual criticism of EMS implementation in general, and a difficulty in linking it with environmental performance (Brouwer & van Koppen, 2008; Comoglio & Botta, 2012; Curkovic et al., 2005; Massoud et al., 2010b; Potoski & Prakash, 2005; Rondinelli & Vastag, 2000; Yin & Schmeidler, 2009). The existence of benefits in EMS implementation has in fact been considered as a subjective reality, being only realistic to organisations with sufficient motivation to implement EMSs (Turk, 2009).

## 2.9 EMS implementation barriers

***Why don't many organisations implement EMSs?***

Though the drivers, benefits, functionality and growth of EMSs have been the focus of many research studies, these same studies as well as several others have also focused on the demerits of EMS implementation (Bansal & Bogner, 2002; Boiral, 2011; Curkovic & Sroufe, 2011; Delmas, 2002; Heras & Arana, 2010; Massoud et al., 2010a; Zutshi & Sohal, 2004). EMS implementation demerits are interchangeably referred to as 'barriers', 'impediments', 'obstacles', 'problems' and 'costs' by organisations (Zutshi & Sohal, 2004). This research study, in discussing EMS demerits, will most commonly refer to the term 'barriers'.

One overwhelming barrier to EMSs is the fact that implementation is not mandatory. EMSs and EMS certification standards are not legal requirements, and generally do not benefit from government facilitation, creating barriers for implementation in organisations (Massoud et al., 2010b). As a result, it is difficult for many organisations worldwide to be motivated into implementation, especially as there are controversies as to the existence of tangible benefits upon implementation.

## 2.10 How do EMSs affect environmental performance?

The impact of EMSs on environmental performance is multidimensional (Boiral, 2011), and can be viewed from different angles. Firstly, EMSs represent a general mechanism for propelling organisations towards more environmentally responsible practices and improved environmental performance. Secondly, more proactive environmental management in turn may lead to non-environmental effects such as improved financial and overall performance (Darnall et al., 2009; Hughey et al., 2004; Comoglio & Botta, 2011; Jabbour et al., 2012).

As mentioned before, there are conflicting views/results on the link between implementing EMSs and environmental performance. Some authors claim that pro-environmental behaviour such as EMS implementation leads to an improvement in environmental (and even organisational) performance, assisting in the potential achievement of key environmental milestones (Gomez & Rodriguez, 2011; Jabbour et al 2012; Link & Naveh, 2006; Massoud et al., 2010b; Rao et al., 2006). However others claim or support opposite viewpoints citing that there is no connection between EMSs and company environmental performance (Brouwer & van Koppen, 2008; Curkovic et al., 2005; Gomez and Rodriguez, 2011). A number of these

studies involve empirical research, such as the investigations by Brandli et al (2009)[1] and Hertin et al (2008)[2] but still provide divergent views about the efficacy of implementing EMSs. A notable number of these studies have not been wholly based on objective environmental data thereby making the impact of EMSs on environmental performance inconsistent, non-significant and questionable. In fact Hertin et al (2008) unequivocally states that there is no evidence that EMS implementation has a significant or positive impact on environmental performance.

EMS implementation has been shown to have positive impacts on environmental indicators such as energy and water use, waste generation, by-products generation, transportation and recycling[3] levels. The impact of EMS implementation on different indicators of environmental performance has been investigated by several studies such as Franchetti (2011), which demonstrated that EMS certification reduced solid waste generation rates, showing the usefulness of EMSs in reducing environmental impact in sample organisations. Rondinelli and Vastag (2000) also found EMSs to have an impact on sample organisations' commitment to recycle. However, studies such as Ilomaki and Melanen (2001) in their analysis of Finnish industrial SMEs (small-medium enterprises), and Gomez and Rodriguez (2011) in their study on the impact of EMS implementation on toxic emission reduction, were unable to find a causal relationship between EMSs and improved environmental efficiency in organisations.

The impact on environmental performance as a result of EMS implementation may be complicated by the fact that organisations feel that they are expected to show that they have specifically gained 'environmental' benefits, and not simply other benefits. For instance, in a study by Hamschmidt (2000), only 3 out of the 10 EMS benefits reported were linked with the environment. Organisations claimed to have gained 'non-environmental' benefits such as improved community relations as a result of their demonstrating pro-environmental behaviour. This indicates that, though benefits may be gained from EMS implementation, its link with environmental performance may still not be established if those benefits are largely non-environmental.

[1] This study showed that there was no notable change in sulphur dioxide and volatile organic compounds (VOCs) emissions after facility certification.

[2] Results of this study show that data on environmental performance from sample companies/production sites provide little evidence that facilities with certified EMSs perform better than those without.

[3] This includes the giving of special consideration to the reuse and recycling of materials such as final products, reduced material purchases and use of recycled materials within organisations.

The timing of EMS implementation in sampled organisations is also important, as the coinciding of EMS certification with implementation of other operations improvement actions (e.g. upgrading of an effluent treatment process) may reduce the likelihood of EMS implementation alone being the main cause of environmental improvement. It may be difficult to show causality between EMSs and performance as there are a number of other reasons why an organisation may show improved environmental performance, including organisational characteristics such as its ownership structure, size and financial status (Zorpas, 2010). This means that the actual impact, if any, of implementing an EMS on environmental performance may be doubtful.

The reasons given for the lack of agreement on the impact on organisations' activities from implementing EMSs are somewhat divergent. Agreement on the impact of certified EMSs may not be reached because: (i) EMSs may not be a powerful driver of environmental performance in the first place; (ii) data availability in existing studies has been too limited to allow for sufficient analysis of actual links between EMS implementation and environmental performance; (iii) other more influential determining factors of environmental performance outweigh EMSs, and (iv) the mechanisms by which certified EMSs achieve performance improvement have not been sufficiently understood by previous research (Hertin et al., 2008; Link & Naveh, 2006).

Though there is little agreement on the existence of a positive relationship between EMSs and environmental performance, there appears to be some basic consensus on the link between implementation of the ISO 14001 standard and adoption of further environmental practices and also on standardization of environmental activities within an organisation. It is assumed that the prospect of EMS implementation leading to increased environmental activity without harming business performance may be a sufficient motivation for organisations to adopt EMSs (Gonzalez et al., 2008; Link & Naveh, 2006). A number of these reasons for lack of agreement are corroborated by a meta-study of 23 studies on the link between EMS and environmental performance, conducted by Nawrocka and Parker (2008). The meta-study suggests that environmental performance is determined on a case-by-case basis and can only effectively be defined by each organisation implementing an EMS.

## 2.11 The uneven economic and geographical certification to EMSs

***Why do different geographic and economic regions exhibit differences in EMS implementation?***

As EMS certification is an optimal form of EMS implementation, trends in the certification to the EMS standard, ISO 14001 by organisations worldwide are examined. Although the initial response to ISO 14001 was considered unenthusiastic (there were only 10,000 certified sites worldwide as at 1999, three years after the release of the ISO 14001:1996 standard), subsequent years have shown improved certification and a sharp growth of companies with sites certified to ISO 14001, evidenced by the 301,647 recorded certifications in existence worldwide today in 171 countries (ISO, 2013). Since the mid-1990s, the adoption of standardized EMSs across national and international industry and government has been prolific[4]. The implementation of externally audited and verified EMSs is now accepted and firmly entrenched within industry and organisations.

ISO 14001's popularity has been strengthened by the fact that increasingly, ISO 14001 certified companies insist that their suppliers adopt the same standard, or refuse to conduct business with non-certified companies. For instance, the US automotive manufacturers Ford and General Motors insist that suppliers adopt externally certified EMSs. Trends like these play an important role in further increasing the acceptance of EMS standards like ISO 14001. Some researchers believe that, in the future, EMS implementation through external registration to the ISO 14001 standard will become the norm rather than the exception (Curkovic & Sroufe, 2011; Massoud et al., 2010b; Tan, 2005).

However, when the total number of organisations in operation worldwide is taken into consideration, it can be said that the current certification figure of 301,647 is relatively small, and that certification to the ISO 14001 standard has been far from enthusiastic. The main reasons for this appear to be related to economic factors, as almost all studies addressing the motivation of organisations to adopt ISO 14001 have supported the theory that the greater an organisation's participation in international markets, the more likely it is to participate in EMS certification (Bellesi et al., 2005). This may imply that organisations with international

[4] In 1999 former United States of America President Clinton declared that all US federal facilities were to have a fully implemented EMS by the end of 2005 (Curkovic & Sroufe, 2011).

operations are more likely to operate externally certified EMSs than their locally situated counterparts. The same trend may be applicable to EMS implementation in general and not simply EMS certification. However, it may be that many organisations are implementing informal EMSs, but are simply not seeking internationally recognized certification for their EMSs, as a result of its irrelevance to their operations.

Adoption and implementation of EMS standards is affected by domestic, cultural, political, and institutional environments, again implying that an organisation will only certify (or even implement) an EMS depending on the environment in which it operates. There are other reasons which may explain the low uptake of EMSs. For instance, as environmental issues may not be of crucial importance to all industries, some organisations may remain doubtful of certifying to ISO 14001 or even implementing EMSs at all (Casper & Hanckj, 1999; Delmas, 2002; Christmann & Taylor, 2006; Curkovic & Sroufe, 2011).

Despite the fact that ISO 14001 has been adopted by geographically diverse organisations, its implementation and extent of diffusion differs across countries (Delmas, 2002), and it appears that its uptake has been country/region dependent. In the early years of the standard's existence, most ISO 14001 certifications were adopted by organisations in developed countries, and generally, developed countries have continued to record a higher percentage of certifications worldwide. Historically, according to a survey on ISO 14001 certifications conducted in 2008, about 40% of all ISO 14001 certificates issued worldwide were issued within the European Union (EU) alone (Gavronski et al., 2008; ISO, 2008). This figure has remained consistent, with a 2013 ISO Survey reporting 39.5% of all certifications issued in Europe (ISO, 2013). In more recent times, certification rates have grown in a new group of countries – transitional economies – including countries such as China, Japan, India and Brazil. These countries have begun to adopt ISO 14001 at increasing rates, and now record higher numbers of certifications than developed countries in Europe[5] (Gonzalez-Benito & Gonzalez-Benito, 2008; Boiral, 2011; ISO 2013). In 2013, the East Asia and Pacific region recorded 50.1% of all ISO 14001 certifications worldwide (ISO, 2013). This means that developed countries as well as transitional or emerging countries i.e. other industrialized nations in Asia, Central and Eastern Europe and Latin America, together dominate the ISO

[5] China, Italy and Japan, were recorded as the top three countries for the total number of total certificates issued worldwide (ISO, 2013).

14001 certification process. With such high rates of certification in specific world regions, it is difficult to refute the regional dependency of EMS implementation/certification.

On the converse, developing countries in Central and South America, Africa and the Middle East together represent 5.2% of ISO 14001 certifications worldwide (ISO, 2013). Again an apparent distinguishing factor in the adoption of ISO 14001 is economic status. Figure 2.5 shows the number of ISO 14001 certifications recorded from 1999 – 2013 in different world regions – Europe, North America, Central/South America, Africa, Central and South Asia, East Asia and Pacific and the Middle East – from 2013 ISO Survey statistics. The statistics reveal an overall growth in the number of certifications worldwide, and also reveal that certifications are largely dominated by Europe and the East Asia and Pacific regions. Other world regions account for a minority of EMS certifications, and some regions (Central/South America and North America) actually recorded declines in certifications figures in 2009 and 2010 respectively. It is important to mention that ISO has acknowledged the existence of erroneous data from its surveys on ISO 14001 certification levels in different countries, as data is compiled through various research methods by organisations in different countries. As a result, apparent declines in certification figures reported in some regions may not be due to a reduction in the number of certified companies, but may be due to other unidentified research inconsistencies (Casadesus et al 2008).

Figure 2.6, using the same statistics, reveals the share of ISO 14001 certifications in each surveyed region, with Europe and the East Asia and Pacific regions both together accounting for approximately 89.6% of certifications recorded worldwide in 2013. As such, though adoption of ISO 14001 is increasing in developed, economically vibrant parts of the world, it is receiving nominal attention in other far less developed parts. Regional (country-specific) differences in EMS implementation have been identified, and linked to factors such as national cultures and other country-specific contexts (Darnall et al., 2008; Jabbour et al., 2012; Nawrocka & Parker, 2008).

According to Casadesus, Marimon and Heras (2008), the success of disseminating ISO 14001 appears to be linked to the complex dynamics of globalization and multinational organisations in western economies. However, there is little evidence from studies as to the reasons why geographical factors play a role in EMS implementation. Investigating the impact of

geographical factors on EMS implementation is made more challenging by the skew of studies towards more developed regions of the world. As the apparent distinguishing factor in EMS uptake may be economic status, economic factors are likely to play a role in the adoption of EMSs by organisations. Certainly, one of the major differences between different world regions is economic capabilities.

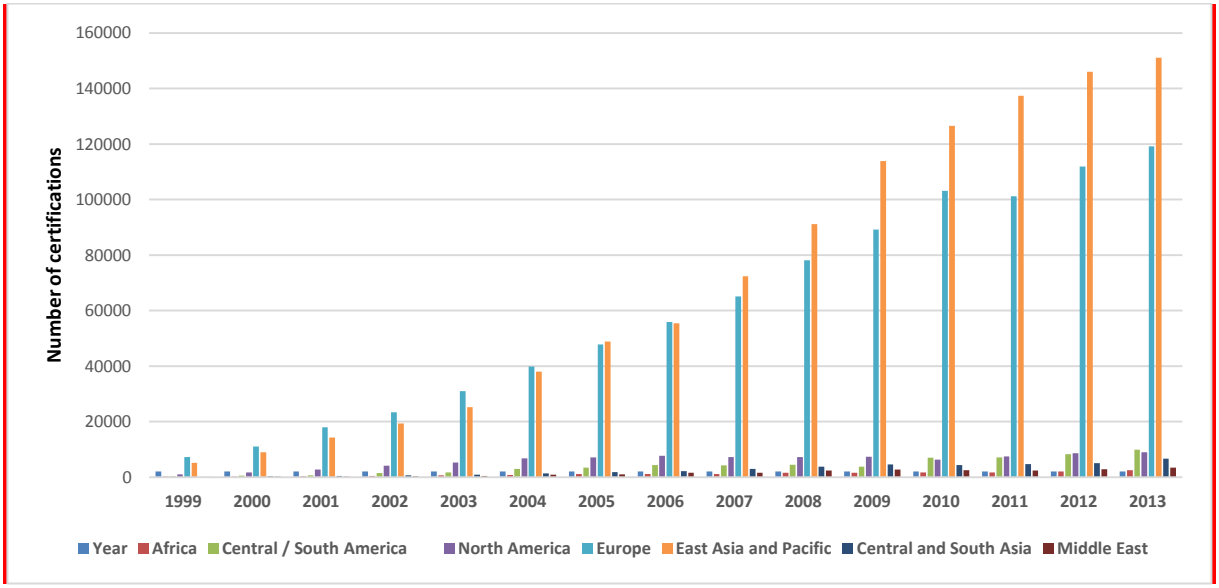



*Figure 2.5 –ISO 14001 world certification levels (Source: The ISO Survey, 2013)*

Factors linked to economic status which affect ISO 14001 EMS adoptions include organisation size and location of parent company. In a study by Kehbila, Ertel and Brent (2009), larger organisations placed greater weight on addressing environmental impacts than smaller counterparts. Economically-enabled organisations tend to implement EMSs more than their less enabled counterparts, as an organisation's size is linked to its economic status. The location of an organisation's head offices appears to affect its approach to environmental management issues e.g. European firms are found to participate to a higher degree in EMS certification than their North American counterparts (Jiang & Bansal 2003; Kollman & Prakash, 2001) evidenced by the slow uptake of ISO 14001 by US organisations, and the decline in US certifications from 7,316 in 2009 to 6,302 certifications in 2010 (ISO, 2010).

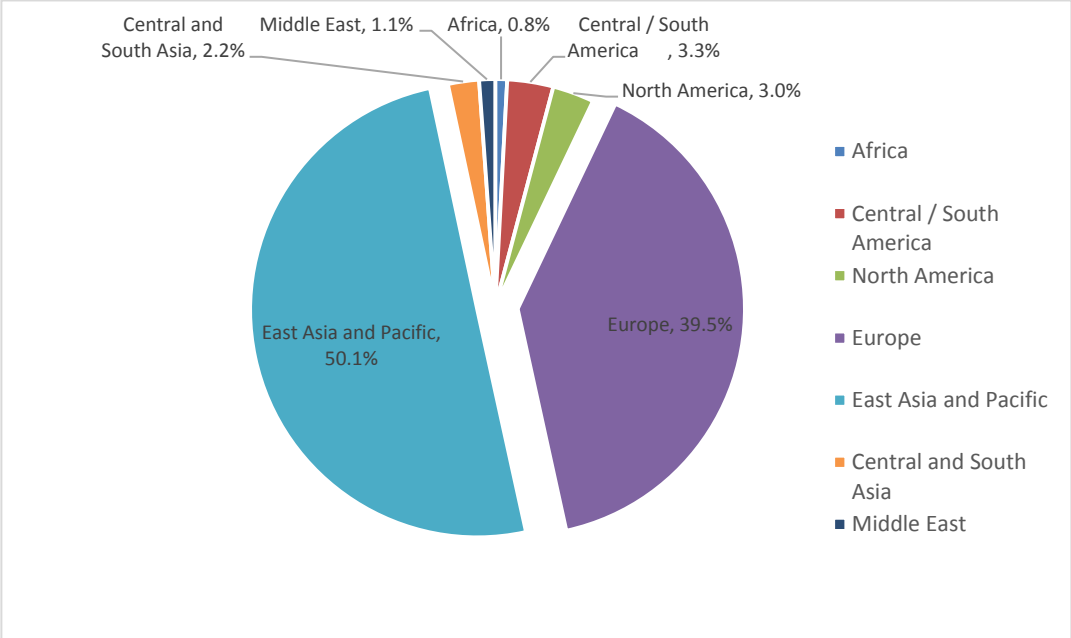



*Figure 2.6 – World share of ISO 14001 certifications (Source: ISO, 2013)*

## 2.12 Statement of need

Though studies have reported on drivers, benefits and barriers to pro-environmental behaviour in the form of EMS implementation, these studies have presented divergent and sometimes contrasting findings. The categorisation of EMSIFs from studies, though having aspects of similarity and comparability, has shown fundamental differences, leading to ambiguity and lack of commonality in classifying EMSIFs. The difficulty in classifying EMSIFs makes the identification of influencing factors for pro-environmental behaviours problematic. It is also more difficult to identify the impact of pro-environmental behaviours like EMS implementation on actual environmental performance. As improved performance is the overall desired result of pro-environmental behaviour, there is a need to clarify the relationship between EMSs and performance, and to determine whether EMS implementation has a notable impact on environmental performance.

Statistics reveal that EMS implementation is affected by geographical and regional specificities most likely linked to economic status (Darnall et al., 2008). This may explain

why more EMS research studies have been either focused on or carried out in developed or emerging countries. As such, the widespread relevance of findings is restricted (Hertin et al., 2008), and the extent to which findings from previous studies are applicable to developing countries with their different economic, cultural and socio-political contexts should be investigated.

A knowledge of the peculiarities affecting the implementation of EMSs in different regions of the world would be enhanced by additional EMS studies based in developing countries and would serve a number of purposes: facilitating the provision of more enabling conditions for EMS implementation in various world regions (this is of particular importance to organisations with operations across world regions); the formulation of non-generic, country/region specific laws for corporate environmental regulation; and development of strategies by organisations for overcoming barriers to EMS implementation.

## 2.13 Identification of research gaps

After a review of existing literature, research gaps were identified. Opportunities instrumental in bridging gaps in research exist, leading to the need to carry out additional academic investigation in the following areas:

1. The re-categorisation of motivations, benefits and barriers (EMSIFs) of pro-environmental behaviour identified in previous studies (Darnall, Henriques & Sardosky, 2008; Gonzalez, Sarkis & Adenso-Diaz, 2008; Heras & Arana, 2010). Though studies have reported on EMSIFs of pro-environmental behaviour, different categorisation models have been used to describe these EMSIFs. Commonalities exist between categorisation models, but there are differences which create variations in the interpretation of EMSIFs, and introduce repetition and disparity in the description of EMSIFs.
2. Further elaboration of research investigating factors affecting pro-environmental behaviour, and an improved understanding of the barriers to implementing and certifying to EMSs, particularly for smaller organisations in developing countries. An identified knowledge gap is the need for an improved understanding of the motivations to adopt EMSs in different international settings and how EMS implementation is affected by

national cultures (Darnall et al., 2008; Massoud et al., 2010a; Massoud, Fayad, Kamleh & El-Fadel, 2010b; Oliveira et al., 2010). A majority of studies on EMSIFs have been conducted in world regions classified as developed and emerging economies, and the need for additional knowledge is obvious in less developed world regions, where studies have been few. Additional studies which provide a parallel understanding of the drivers of pro-environmental behaviour, and barriers and potential or actual benefits are needed. For multinational organisations with operations transcending regions, the assumption that EMSIFs of pro-environmental behaviours are similar across regions may be erroneous. It is important to create different geographical and regional profiles of EMSIFs through additional academic research.

3. Clarifying different organisations' views on environmental performance. Studies report that different organisations have differing operations and regulatory environments, and each has inherent measures and values of performance (Bellesi et al., 2005; Perotto et al., 2007; Darnall et al., 2008; Hertin et al., 2008; Massoud et al., 2010). This indicates that, as organisations are motivated differently, environmental performance measurement should align with individual organisations perceptions and values of environmental performance.

The research gaps identified above have been developed into research objectives for this work. Research objectives are detailed in Chapter 1 of this thesis.

# CHAPTER THREE

# METHODOLOGICAL APPROACH, PHILOSOPHICAL ASSUMPTIONS AND METHODS

## 3.1 Introduction

The research methodology chapter describes the procedural framework within which this research has been conducted, and how the solution to the research problem has been practically approached during the research process (Remenyi, Williams, Money and Swartz, 1998). Choosing a research methodology requires a consideration of the practicalities of research, academic interests and knowledge gaps, but most importantly, it involves proffering a philosophical solution to the question "Why research" (Holden and Lynch, 2004).

## 3.2 Research problem

The management and control of an organisation's impact on the environment is facilitated by the development and implementation of an EMS (Darnall et al 2008; Nawrocka & Parker, 2008; Zorpas, 2010; Boiral, 2011; Comoglio and Botta, 2012). It can be said that EMS implementation is an optimal form of demonstrating pro-environmental behaviour.

However, there are barriers, drivers and benefits associated with demonstrating pro-environmental behaviour. Some of these barriers are evidenced by the comparatively low number of organisations with informal, formal or certified EMSs. Though over 800,000 organisations (only a small fraction of them are functional) have been registered by the Nigerian Corporate Affairs Commission (CAC) between 1960 and 2014, certification organisation indicate that as at 2013, there were approximately only 150 - 200 companies with formal EMS certifications (ISO 14001) in Nigeria. Although other forms of demonstrating pro-environmental behaviour exist, statistics on formal EMS implementation present a useful way of identifying organisations' pro-environmental behaviour. This is because an EMS encompasses all organized environmental efforts an organisation makes, and EMS certification is an obvious and easily identifiable entity.

Furthermore, results of previous research on the connection between EMS implementation and environmental performance have been inconclusive, and there are few readily available formal statistics on the impact of implementing EMSs on Nigerian organisations' environmental performance. In fact, in general there have been few EMS studies in developing nations (Massoud et al., 2010a).

This research addresses the problem of discovering i) the extent to which Nigerian organisations have implemented structured EMSs, ii) the challenges experienced in EMS implementation, iii) the perceived benefits derived and, iv) the barriers preventing these organisations from EMS implementation. This research also contributes to solving the problem of an insufficiency of EMS studies from developing countries by determining EMSIFs affecting EMS implementation and proffering measures to encourage the uptake of EMSs (Bansal and Bogner, 2002; Delmas, 2002; Zutshi and Sohal, 2004; Hertin et al 2008; Nawrocka & Parker, 2008; Kehbila et al., 2009; Heras & Arana, 2010; Massoud et al., 2010a; Zorpas, 2010; Boiral, 2011).

## 3.3 Research philosophy - Environmental management in organisations (an aspect of organisational sociology)

'A discussion of philosophy is essential before proceeding on a research project' (Remenyi et al., 1998, p.309).

An organisation is a social unit, and any study of organisations or organisational behaviour is a sub-set of sociological research (Burrell & Morgan, 1979). As this research is focused on elements of organisational behaviour, its fundamental philosophies, assumptions and methodology have also been based on organisational sociological theories.

The main philosophical assumptions of this research lean towards a sociological positivist stance, in which scientific methods are applied to research of a sociological nature. The guiding paradigm is fundamentally positivist, as it tries to explain the social reality of organisations by proffering an analysis of data, which is expected to clarify social phenomena

regarding organisational behaviour. In this case, the study of organisational behaviour is considered to belong to a natural order which is subject to unbiased investigation (Grix, 2004).

Different ontological, epistemological and human nature models within the sociological positivist stance are inclined towards what is referred to as the 'objective dimension of philosophical paradigms', which focuses on the objective analysis of relationships and regularities between different elements being considered. The sociological positivist stance adopts a realistic ontological position, with a positivist epistemology, comparable deterministic views of human nature and uses objective nomothetic methodologies based on systematic protocol and technique (Burrell and Morgan, 1979). Figure 3.1 shows the different components of sociological positivism, in the dark shaded portions.

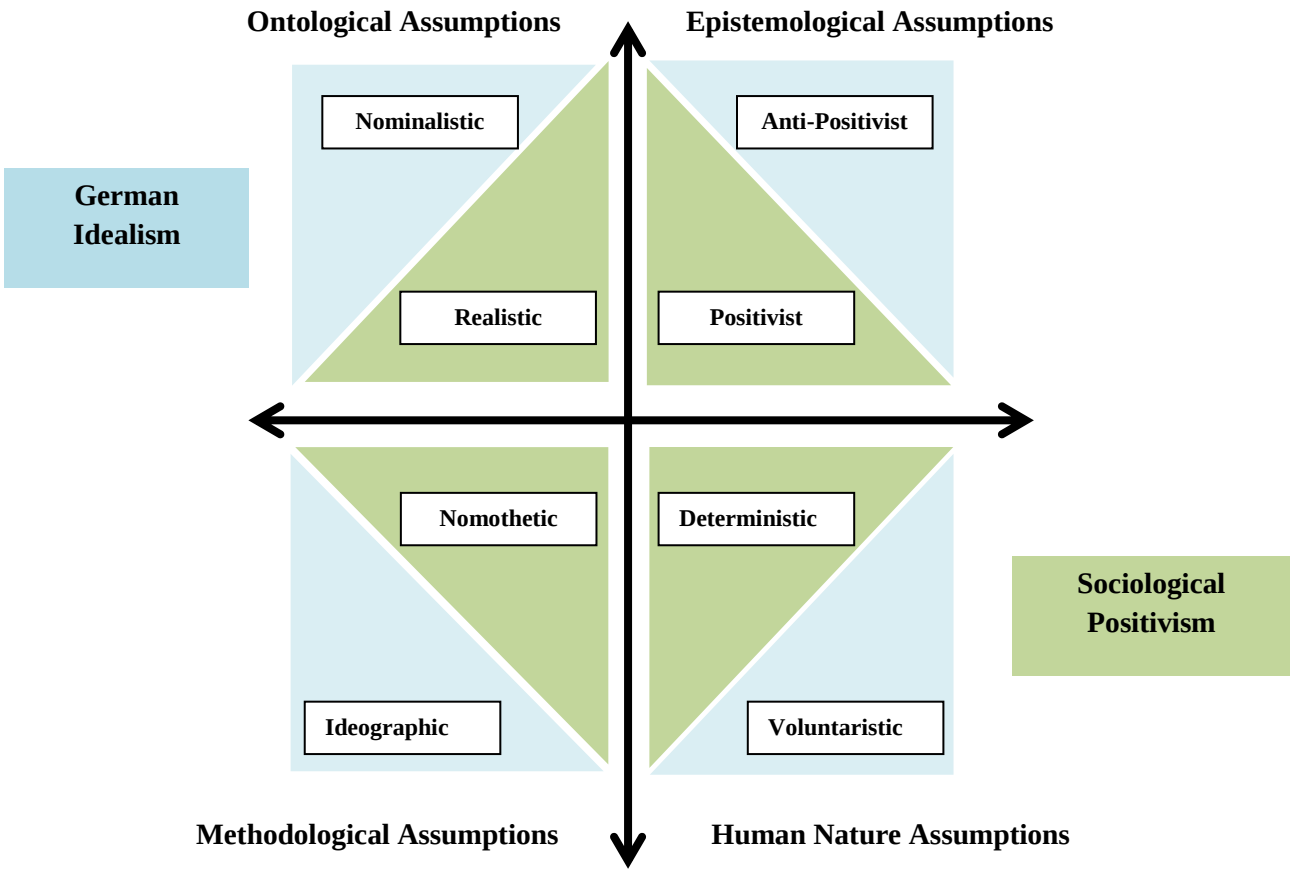


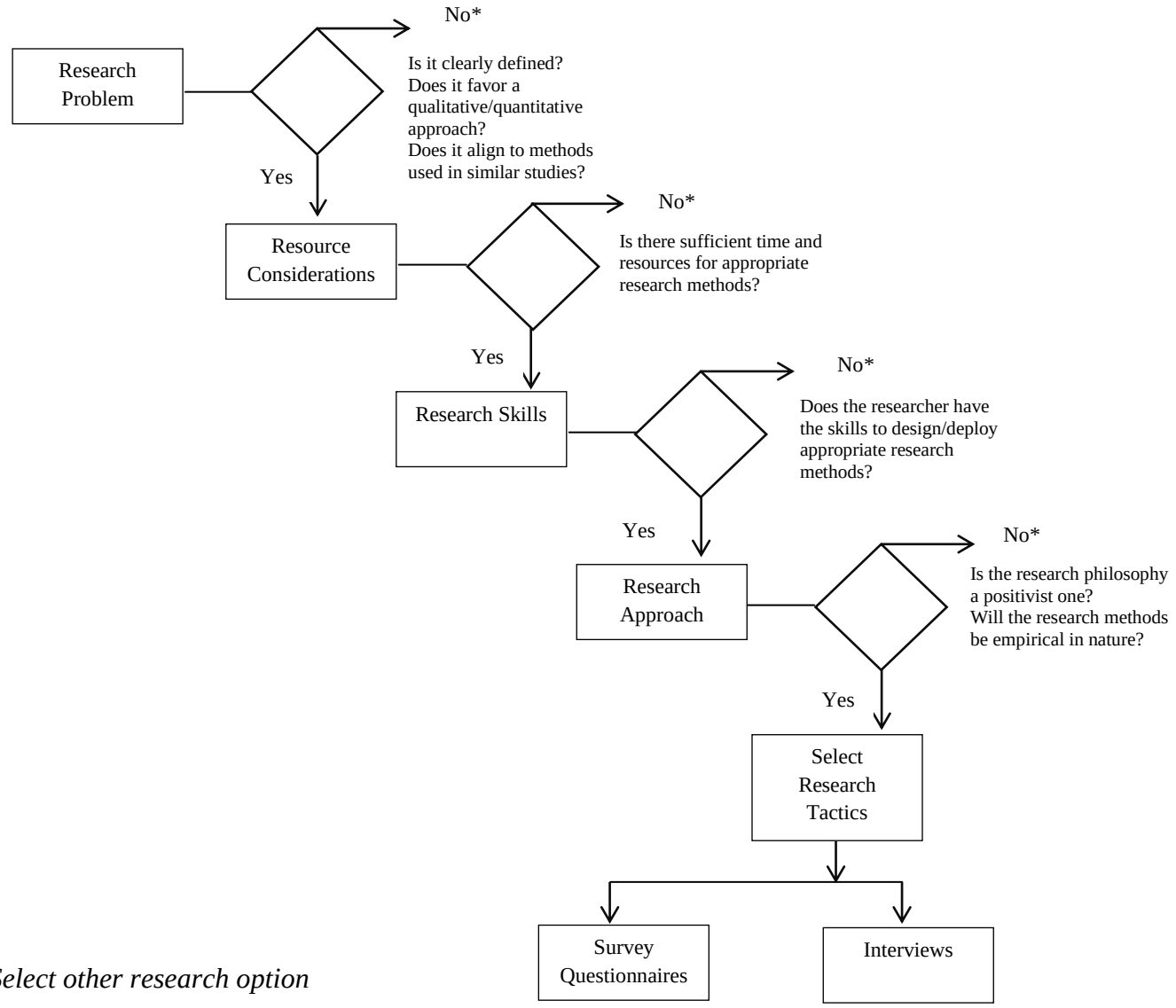

*Figure 3.1 – Sociological paradigms (adapted from Burrell and Morgan, 1979)*

The organisation is considered as an observable social reality, being analysed and interpreted by objective, quantifiable means. Each organisation within society exists in a specific location, is guided by specified objectives (or operations), is run by identifiable persons, and in general functions within a real setting. The ontological considerations of this research revolve around the actual essence of research phenomena i.e. how real EMS implementation factors such as drivers, benefits and barriers are to an organisation, and whether they exist externally and independent to the organisation or whether they are an internal product of the organisation's consciousness. Ontological considerations here also include reflections on the tangibility of the impact of EMS implementation on an organisation. The ontological assumptions lean towards a realistic ontology which presumes that social influences around organisations are real and of a tangible nature. This leads to the epistemological stance, which focuses on forms of knowledge that will be produced by the research and how these may be interpreted by the public. This research acquires information on EMS implementation in organisations, which may be transmitted in an objective form. The gathering of hard, transmittable information assumes a positivist epistemology in organisational research, implying that information can be collected quantitatively from organisations using structured means such as a questionnaire.

Another philosophical position considered in this research is associated with the relationship between the organisation and its surrounding social environment. It is assumed that, within the context of this study, organisations are a by-product of their environment, and are somewhat conditioned to it, responding to their environment in a deterministic manner (Burrell & Morgan, 1979). Each organisation within the sample is considered independent of the researcher. The ontological, epistemological and human nature assumptions of this study have guided the selection of quantitative (and qualitative) research methodologies geared towards obtaining statistically quantifiable results that facilitate the development of generalizable patterns in EMS implementation by organisations (Remenyi et al., 1998).

## 3.4 Research strategy

The positivist approach to research usually involves empirical methods (Burrell & Morgan, 1979). Moreover, studies involving business and management are traditionally empirical in approach (Remenyi et al., 1998). Figure 3.2, adapted from a description of research strategy development from Remenyi et al (1998) details the process by which the specific research methods have been selected. Tables 3B-1 and 3B-2 in Appendix 3B show methods used in previous similar studies, which have informed the selection of research methods for this study.




** Select other research option*

*Figure 3.2 – Research methodological approach (adapted from Remenyi et al., 1998)*

## 3.5 Introduction to research methods

Research methods used include literature searches, systematic reviews, and the use of structured questionnaires and interviews. The integration of research methods is depicted in Figure 3.3.

## 3.6 Systematic reviews

In order to ensure proper structure and traceability and to reduce bias, the main elements of the systematic review method (SR) method (CEE, 2010) were used in conducting a review of previous and existing literature on EMSs and related topics. Sources of information for the literature review included:

1. Academic and theoretical content on EMSs, EMS implementation and environmental performance;
2. Previous research work on EMS's and EMS implementation in organisations;
3. Published case studies of EMS implementation in organisations;
4. Text on the meaning, use, applicability, drivers, benefits and barriers to EMS certification standards such as ISO 14001;
5. Nigerian environmental legislation and/or legal requirements relating to EMS implementation as well as legal requirements and best practice standards relating to or requiring EMS implementation;
6. Articles and publications on EMS implementation and environmental management in Nigeria.

### 3.6.1 Use of the systematic review method for review of literature

Literature reviews are aimed at assisting researchers map out and evaluate the existing intellectual content in a specific field of study, with a view to identifying knowledge gaps and corollary research questions to further develop the existing body of research (Tranfield, Denyer and Smart 2003).

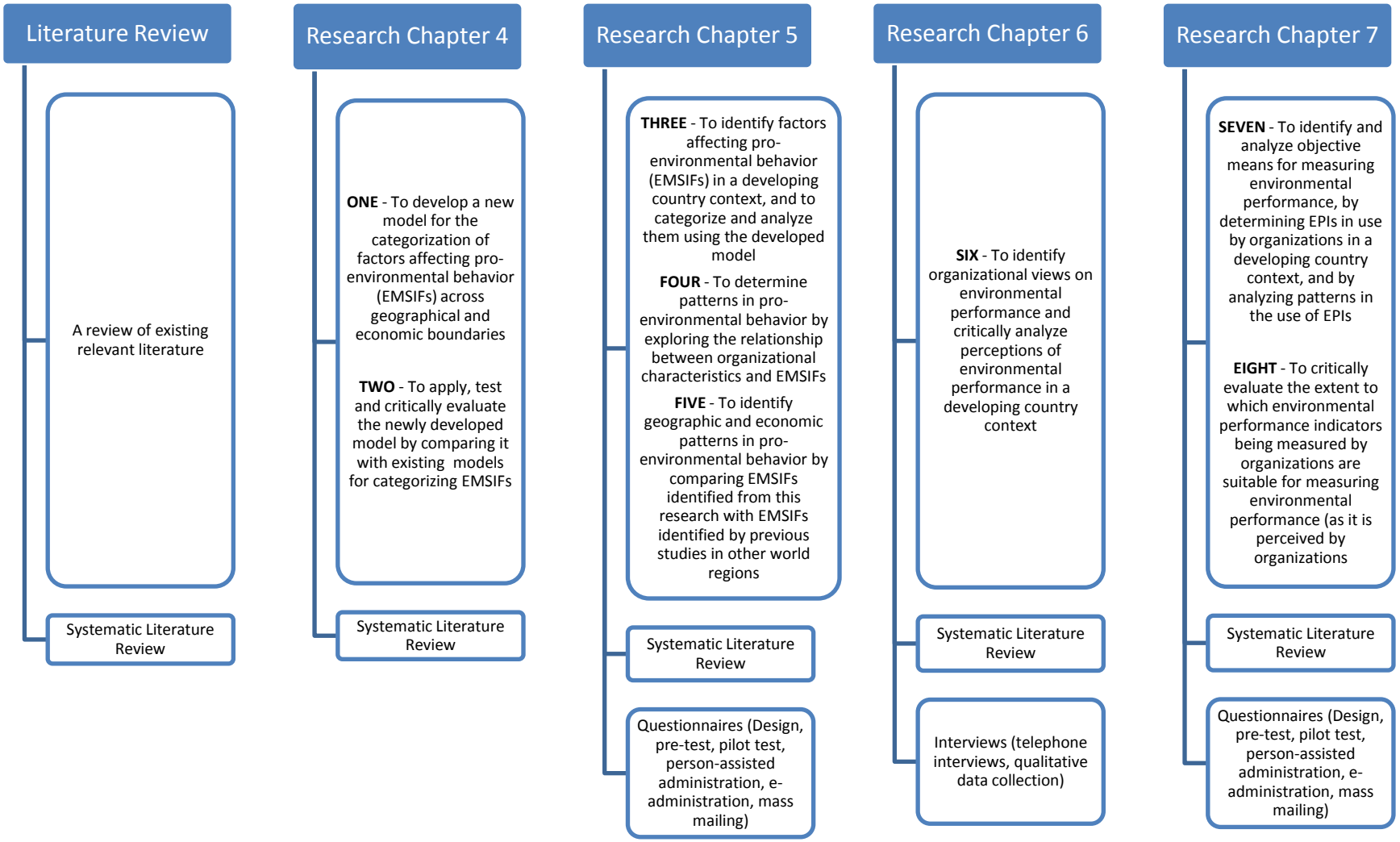



*Figure 3.3 - Research methods used*

An efficient way of approaching reviews of literature is through the SR method, which adopts a traceable, logical and clear process that minimizes bias through thorough literature searches of published and unpublished studies, while cataloguing an audit trail of the searchers procedures and findings (Cook, Mulrow and Haynes 1997).

SR was selected as a method for conducting the literature review in order to introduce objectivity, reliability and traceability to the search process, and also to reduce author bias. This methodology was also considered appropriate for this literature review because, even though initially developed to test the effectiveness of interventions in medical practice, its use has broadened considerably, and the method is now used to address a range of different types of questions in research (Collaboration for Environmental Evidence, 2010). Two similar and generally accepted approaches to the conduct of SRs were intertwined – the two-phased approach (Pullin and Knight, 2009) and the knowledge mapping approach (CEE, 2010).

SRs start with a specific question (CEE, 2010). Pullin and Knight (2009) explain that in order to ensure the right question is selected there should be a two-phased approach, which involves adopting a holistic approach (involving a large number of variables) and a reductionist approach (limiting relevance, value and utility) to the review. This two phased approach was identified for breaking down open-framed questions into more detailed elements in order to identify close-framed questions more suitable for systematic review. The approach involves defining the research questions, identifying potential strategies for addressing the questions, and then identifying interventions which could help to deliver those strategies.

The knowledge mapping approach involves the undertaking of two stage reviews, with a 'knowledge map' of the research, followed up by one or more full syntheses on subsets of research identified in this map. A major advantage of the knowledge mapping approach is the fact that it enables the identification of pools of research which may be used to address a more narrowly defined review question (CEE, 2010). In order to fully address the broad issues raised by the research questions focused on in this thesis, it was necessary to conduct reviews and research at tiered levels, while identifying and answering more specific research questions.

To address the need for scientific compromise, broad questions relating to the implementation and impact of EMSs on organisations in general were posed and examined at the initial phase of literature review. This was also done to ensure an in-depth understanding of the background and conceptual issues relating to pro-environmental behaviours such as EMS implementation. Findings from the review of the broad question led to the formulation and review of subsequent, more detailed research objectives.

A phased approach was taken in the posing of broad questions, whereby tiers (Tier 1 & 2) of research questions were posed, and structured literature searches were conducted on them. More focused research questions, which would be instrumental in the formulation of feasible research aims and objectives for this research, were formulated as a result of the gap analysis and findings of initial searches. Specific details on SR strategies used, including initial question formulation, search strategies, keyword selection, Boolean operators, wildcard terms, literature search and inclusion criteria, sources of information, analysis of search results and literature search restrictions are described below.

## 3.7 Systematic review strategies used

### 3.7.1 Question formulation

The following were used as guidelines when formulating research questions for SR:

1. The posing of scientifically answerable questions (Jackson, 1980)
2. The definition of structural elements of the questions to aid the identification of search terms to be used in the literature search and,
3. The determination of relevance criteria (CEE, 2010).

The initial, broad questions were:

*Tier 1 - How do EMSs impact on the organisations that implement them?*

*Tier 2 - What are the challenges to the successful implementation of EMSs?*

Questions for SR usually have four definable elements, often referred to as the PICO or PECO (Population/Subject, Intervention/Exposure, Comparator, and Outcome) elements (CEE, 2010). The subject represents the focus of the question, the intervention refers to an aspect which is introduced to interact with the subject, the outcome refers to result of the intervention's interaction with the subject, and the comparator represents the situation in which the intervention is absent. The first broad research question was broken down into definable structural elements as shown in Table 3.1:

*Table 3.1 – Structural elements of the first broad research question*

| **Question** | **Subject** | **Intervention** | **Outcome** | **Comparator** |
|---|---|---|---|---|
| **How do Environmental Management Systems impact on the organisations that implement them?** | Corporate organisations/ companies with structured/unstructured EMSs | Environmental management systems | Quantitative/qualitative measurable impact on corporate performance or an environmental parameter/indicator | No/Absence of EMS |

### 3.7.2 Search keyword/term selection

In order to conduct an organized literature search to provide answers to the research questions, suitable search words were selected from each definable PICO/PECO element of the research questions. During the search, combinations of the search terms shown in Table 3.2 were used.

*Table 3.2 – Systematic review search words/terms*

| **PICO/PECO Element** | **Words/Terms** |
|---|---|
| Subject and Intervention-related Words/Terms | Environmental Management System, EMS, ISO 14001, EMAS, Company, Organisation |
| Outcome-related Words/Terms | Performance, Indicator, Implementation, Benefit, Impact, Advantage, Disadvantage, Positive, Negative, Gain |
| Other Words | Potential, Challenge |

### 3.7.3 Wildcard terms

Wildcard truncation symbols such as * were used to search for variant word endings. Similar and alternative spellings to search words/terms were also included as follows:

1. Organi*
2. Company vs Companies, Organisation vs Organisation, Corporate vs Corporation
3. Environmental vs Environment
4. ISO 14000 vs ISO 14001

### 3.7.4 Boolean operators

*a. Boolean operator - AND*

The Boolean Operators, AND, OR and NOT were used to reduce the number of irrelevant results obtained during the literature search. In particular, the Boolean Operator 'AND' was used during the search to combine very important key words/terms, to reduce the irrelevance of search results. For instance, the combination of terms (environmental management system, company, benefit) was used with the Boolean Operator 'AND' as depicted in Figure 3.4:

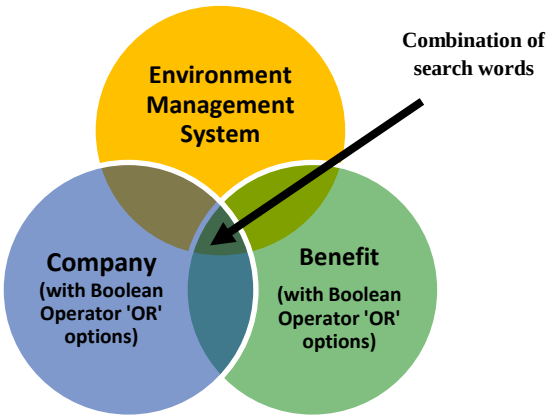



*Figure 3.4 – Combination of search terms with Boolean operators*

*b. Boolean operator - OR*

The Boolean operator 'OR' was used to further improve the relevance of results by combining:

1. Terms with acronyms
    a. International Organisation for Standardization OR ISO
    b. Environmental Management System OR EMS
2. Words with similar spellings and words/terms often used interchangeably
    a. Organisation OR Organisation
    b. Environment OR Environmental
    c. Environment Management OR Environmental Management
    d. ISO 14001 OR ISO 14000
    e. Company OR Companies
3. Words/terms with the same or similar meanings but not necessarily used interchangeably
    a. Benefit OR Gain OR Advantage OR Positive
    b. Disadvantage OR Negative
    c. Company OR Organisation (OR Organisation)
4. Popularly mistaken terms
    a. International Standards Organisation OR ISO

*c. Boolean operator - NOT*

The Boolean Operator 'NOT' was used to narrow down results when a large number of irrelevant literature was obtained.

### 3.7.5 Search fields, term selection and stringing

The search field 'Abstract' was selected when searching for literature in the databases used. This meant that literature containing the key words within the abstracts would be selected. On finalization of each level of research question, appropriate search terms were selected.

### 3.7.6 Literature search restrictions and inclusion criteria

During the initial literature search, no time or document type restrictions were applied. Subsequently, when final search strings were selected, time restrictions were applied and the actual search was conducted. Details of search results are in Appendix 3A of this thesis. Literature found using the search words was screened for relevance by using all the following inclusion criteria taken directly from definable elements of the Tier 1 and 2 review questions:

1. Subject – *Corporate Organisations/Companies with structured EMS*. This included literature which focused on aspects of a company's/corporate's/private organisations' activities relating to an implemented EMS within that organisation. This excluded literature which focused on EMS's within public sector organisations.
2. Intervention – *EMS & ISO 14001*. This was taken to mean literature which contained information on the applicability and implementation of a structured EMS, (preferably) ISO 14001, within a corporate organisation.
3. Outcome – *Quantitative/Qualitative measurable impact on corporate performance or environmental parameter/indicator*. This was taken to mean literature which contained information on the potential or actual impacts and benefits of implementation of a structured EMS within an organisation. Also of interest was literature containing information on indicators which could be used to assess environmental performance of organisations with structured EMS's, and environmental indicators which are specifically impacted by EMS's. Literature which focused on integration of EMS's with other management systems was excluded.
4. Comparator – *No/Absence of EMS*. Literature which focused on corporate performance as impacted by the absence of a structured EMS was also included.
5. Repetitions – Literature which had already been captured by another search were either not included in or were excluded from the review list.

### 3.7.7 Screening methods

**a. Step one – Review of titles and removal of repeated results**

If the title of the literature was found to contain any of the definable elements of the question, then it was initially included in the review list. Titles that did not contain any of the question elements were discarded. Citation and full texts for the initial list were searched for and saved. At this point, any repetitions from the searches conducted in different databases were also removed.

**b. Step two – Review of abstracts**

A further review of shortlisted results was conducted by a review of literature abstracts. If the abstract was found to contain any of the definable elements of the research question, then it was shortlisted for full review and included in the review list. Papers with abstracts that did not contain any or sufficiently relevant information which could answer the research question elements were discarded.

**c. Step three – Review of full literature**

Full text of relevant papers was fully reviewed for content.

### 3.7.8 Sources of information for literature review

The following sources were used when searching for relevant literature:

*a. Electronic databases of academic literature* - Databases of peer-reviewed academic papers were used to identify literature. They were:

1. The Web of Knowledge
2. Science Direct

*b. References from academic literature retrieved from database search* - Relevant references from the final selected literature were used as an important source of searching for further literature.

c. *Grey Literature Sources* - Due to the possibility that the formal, structured sources of academic literature used during the search could provide insufficient knowledge of the research subject area, it was necessary to search for grey literature from sources within (and directly relating to) the Nigerian regulatory and corporate framework such as:

1. The Federal Ministry of Environment
2. The National Environmental Standards and Regulatory Agency
3. EMS Certification Bodies (Standards Organisation of Nigeria, Bureau Veritas, SGS Ltd)
4. The World Bank Info Shop
5. Corporate Libraries
6. University Libraries

d. *The Internet* - Internet search engines were also perused for information. Searches were limited to the first 40 findings (representing the first 2 – 3 pages of search results popularly considered to produce the most relevant results in a web search), and these were checked for relevance. Internet search engines used include:

i. scholar.google.com

ii. www.google.co.uk

iii. www.scirus.com

iv. www.dogpile.com

### 3.7.9 Unavailable literature

Search results for which full text versions could not be retrieved were added to a separate review list, and the following secondary options were attempted as appropriate:

a. The full text was retrieved from an alternative source, such as the publisher's website
b. The abstract was retrieved and used as the review/reference material
c. If the result was considered of sufficient interest, it was requested for from the University of Salford library resources.

### 3.7.10 Literature review results' analysis

A standard approach to critical appraisal in a SR would initially involve categorising the study design (Bowler et al., 2010). A template (excel spreadsheet) was developed for collecting information on the literature results, including:

a. Basic study information – title, author's/source organisation, publication journal title, year of publication, web address (if obtained online), keyword search string used/other source
b. Geographical location of study/paper – this was grouped into categories – Developed country(ies), developing country(ies) and emerging country(ies), in order to attempt to make comparisons or determine differences in the implementation or impact of EMSs in different locations. Information about the specific country location of the study/paper was also recorded
c. Aims and objectives/Problem definition – The main reasons for the study/paper were recorded including research questions defined and any hypotheses propounded
d. Type of study/Study design – e.g. single company case study, cross-sectional/industry case study, meta study, comparative study
e. Main data collection methods employed – Quantitative or qualitative methods used and the validity of statistical methods were recorded. Of specific interest was the success rates of data collection methods such as questionnaire distribution in different geographical locations
f. Main findings/conclusions – Response rates (especially for distributed questionnaires), level of detail, consistency of conclusions with findings (to analyse the possibility of bias) were recorded in order to assess the reliability of the study/paper and the conclusions drawn by the author(s)
g. Research gaps (if any) identified – This was a particularly important aspect as the existence of specific research gaps or opportunities for further research was recorded to serve as an input into the aims and objectives of this research.

After being mapped into the excel spreadsheet, literature review results were analysed using a thematic approach. Search result contents were grouped into themes to aid critical literature review, as follows:

1. History and rationale for environmental management, EMS and history, nature, structure of ISO 14001
2. EMS and environmental regulation
3. Disparity/differences in research opinion on ISO 14001/EMS benefits
4. Advent, uptake and popularity of EMS/ISO 14001
5. EMS/ISO 14001benefits, lack of benefits, categorisation
6. EMS and environmental performance, measuring environmental performance
7. Performance indicators - definitions
8. Performance indicators - uses, benefits, types
9. EMS/ISO 14001 drivers, reasons for implementation
10. EMS/ISO 14001 drivers, benefits
11. EMS/ISO 14001 costs, disadvantages, barriers

Literature search results can be found in Appendix 3A.

## 3.8 Use of questionnaires

Questionnaires are widely used for collating data on research involving social entities (Phelan and Reynolds, 1996). An analysis of 52 studies conducted on pro-environmental behaviour in the form of EMS implementation between 2001 and 2011 showed that quantitative data collection methods (survey questionnaires) were predominantly used, as detailed in Tables 3B-1 and 3B-2 in Appendix 3B of this thesis. Similarly, in this research reported in this thesis, a structured survey questionnaire was used to collect information from respondents.

However, though questionnaires offer a reliable method of collating quantitative and qualitative data, there are limitations to their use. Data collated through questionnaires is self-reported by respondents, and often cannot be verified by researchers. This leads to the existence of an inherent self-reporting bias, whereby responses are affected by individual views of respondents (Casadesus et al., 2008; Heras and Arana, 2010). Responses obtained from questionnaires are also affected by the design/designer of the questions (Casadesus et al., 2008; Hertin et al., 2010; Phelan and Reynolds, 1996; Quazi et al., 2008). Questionnaires collecting information on EMS implementation may also face the possibility of respondent

interpretation problems because EMS motivations and outcomes are measured together and EMS drivers could also be benefits for respondents. The possibility of reverse causality bias also exists, in which EMS benefits might influence respondents' perception of its drivers (Boiral & Roy, 2007; Heras et al., 2010). For example, respondents reporting particular benefits from EMS implementation may also report that they are driven by similar drivers.

A combination of closed and open-ended questions was used in the questionnaire. To overcome potential problems with self-reporting bias and clarity of responses, all questions except one were close-ended. For close-ended questions, respondents had to select from a range of provided answers. A Likert-type scale of 1 - 5 (Very important, important, not sure, of little importance, not important at all) was used to grade questionnaire responses, to improve the ease of survey completion, data recording and analysis. It should be noted that the use of close-ended questions potentially reduces the richness of responses and reduces the scope of research findings to the questions asked and responses given. Subsequently, the number of responses which can be analysed is limited to the number of responses received back from respondents.

The single open-ended question was used to elicit responses on environmental performance. In this instance, an open-ended question was used to ensure that respondents provided information responses which were not influenced by the researcher.

Response rates were increased through person-assisted retrieval of questionnaires from respondent organisations.

### 3.8.1 Questionnaire design

The questionnaire was designed to be administered to a range of Nigerian organisations, across different industry types. The main objective of the questionnaire was to facilitate a structured survey among Nigerian organisations in order to:

a. Collate statistics on:
    i. Drivers, benefits and barriers to demonstrating pro-environmental behaviour or implementing EMSs in Nigerian organisations
    ii. The level of environmental management amongst Nigerian organisations

b. The identification of trends in environmental management in Nigerian organisations based on organisational characteristics such as size, ownership and structure
c. Existing environmental performance indicators being used by Nigerian organisations to monitor environmental performance

A detailed description of the design of different sections in the questionnaire can be found in Appendix 3G of this thesis. The full research questionnaire can be found in Appendix 3H.

### 3.8.2 Sampling methods

A random sample is one in which every member of the population has an equal chance of being selected. However, as achieving randomization is not always feasible it can be difficult to achieve simple random samples (Lane, 2011). There were challenges in achieving simple random samples for this research, especially as the population consisted of organisations in Nigeria. This is because it was difficult to obtain a sampling frame by identifying all the elements in the population i.e. all Nigerian organisations, as there are no existing comprehensive lists of functional organisations in the country. Although the CAC in Nigeria has records of all registered organisations, a majority of these are believed to be non-functional. There are also no official statistics for the current population of functional Nigerian organisations, but sources from local certification firms claim that there are about 5,000 - 10,000 operational organisations in the country.

As no reliable information on functional organisations exists, it was not possible to accurately determine various stratifications and proportions (e.g. of organisation size, corporate structure, ownership structure) within the population. Therefore, a degree of purposiveness was introduced into the process of sampling, whereby some respondents were selected based on their degree of 'representation' of the population. The use of purposive sampling was important in this research, as the population was considered 'difficult-to-reach' (Neuman, 2006). As Curkovic and Sroufe (2005) have stated that external validity can be more readily achieved through cross-industry studies, a range of industries were used in sample selection.

Selection of respondents was done so as to obtain a random sample by attempting to ensure that every element in the population (organisations in Nigeria) had the same chance of being

selected (by the researcher). Achieving randomization was attempted by combining a number of selection techniques as follows:

1. Random selection of Nigerian organisations registered in corporate directories
2. Random selection of organisations across a range of industry sectors
3. Inclusion of organisations in all Nigerian geo-zones in the sample

Organisations in all geo-zones of Nigeria were included in the sample population, including the Lagos zone (most organisation-dense zone), Northern region (North-EastNorth-West and North Central zones), and Southern region (South-East, South-West and South-South zones). Figure 3.5 shows a map of Nigeria depicting different geo-zones in the country.

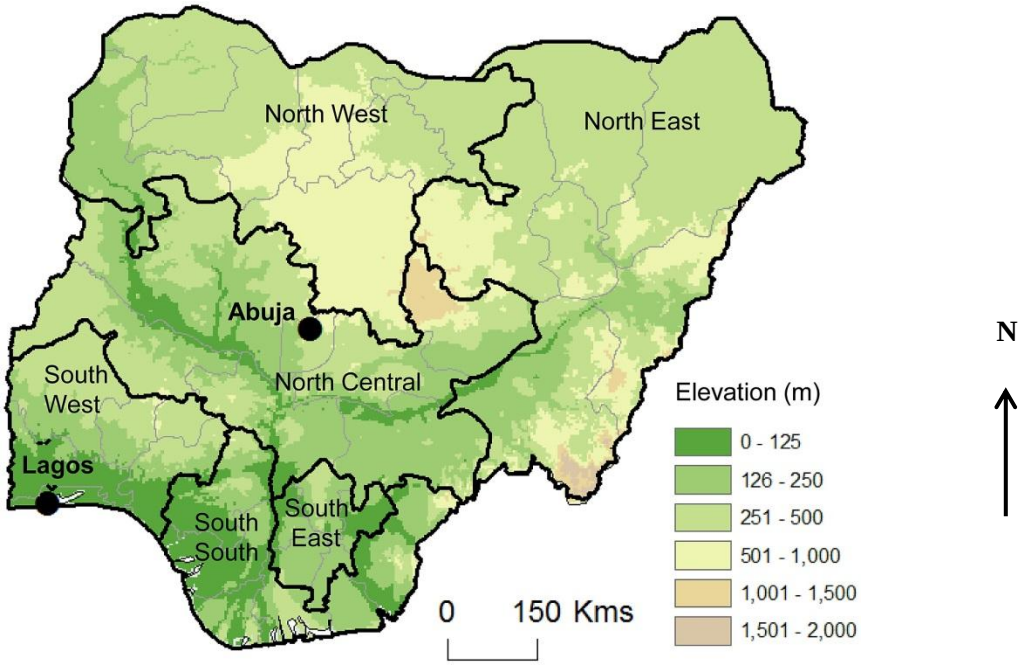



*Figure 3.5 – Map of Nigeria showing geo-political zones (Source – Okorie et al., 2013)*

### 3.8.3 Questionnaire administration

Questionnaire administration involved the following phases:

*a. Phase One - Questionnaire Pre-testing* - Before pilot-testing, a pre-testing of the survey questionnaires was conducted. A group of six (6) organisations, considered knowledgeable in environmental management, were asked to assess the draft survey questionnaire and provide feedback on its suitability and content by filling out a Questionnaire Pre-testing Feedback Form (this can be found in Appendix 3C). These organisations were chosen on the basis of their representation of different organisation types and because of their availability to participate in the pre-testing process. A brief description of respondent organisations that participated in the questionnaire pre-testing is shown in Table 3.3. The draft copy of the questionnaire was reviewed and revised based on responses from the pre-test.

*Table 3.3 –Organisations involved in questionnaire pre-testing*

| Name of Organisation | Organisation Industry Type |
|---|---|
| Organisation 1 | Environmental Certification Body |
| Organisation 2 | Environmental Certification Body |
| Organisation 3 | Environmental Services Consultancy |
| Organisation 4 | Environmental Management Consultancy |
| Organisation 5 | Environmental Management Consultancy |
| Organisation 6 | Oil and Gas Upstream Operations |

*b. Phase Two – Questionnaire Pilot Testing* – The revised questionnaire was pilot-tested by administering it to 22 (twenty-two) organisations. The organisations involved in pilot testing were from a range of industry sectors - 5 organisations were from the service provision sector; 4 organisations were from the oil and gas upstream sector; 3 organisations were from the manufacturing sector; 1 organisation was from the oil and gas servicing sector; 1 organisation was from the telecommunications sector; 1 organisation was from the engineering services sector; 1 organisation was from the financial services sector; 1 organisation was from the construction sector; 1 organisation was from the government sector, and; 2 organisations were from other sectors.

Pilot testing was performed to: identify preferred methods of responding to the questionnaire; assess the ease with which respondent organisations answered questions; identify any problematic areas within the questionnaire, such as those where questions were not fully understood by respondents; identify questions which were overlooked (left unanswered) by multiple respondents, and; identify any other challenges associated with the questionnaire

administration process. Questionnaire administration for the pilot test was done via email and direct delivery to each organisation's relevant contact persons. After intensive follow-up through email messages and telephone calls, 15 responses were retrieved, representing a response rate of 68%. The questionnaire document and administration process was further revised after the pilot testing phase. Appendix 3D details the main adjustments made to the questionnaire after pilot testing.

*c. Phase Three – Final Questionnaire Administration* - The final survey questionnaire was administered to a total of 1070 organisations between August 2012 and September 2013, details of which were obtained from business directories and researcher contact databases. Although similar studies conducted in other world regions have adopted the mass mailing method for delivery of questionnaires, this approach was not considered to be the most effective for the developing country setting of Nigeria (Quazi et al., 2001; Delmas, 2002; Gavronski et al., 2007; Jabbour et al., 2011). This is primarily because of a culture of non-responsiveness and poor communication from Nigerian organisations. A direct approach involving delivery of questionnaires to and retrieval from respondents was considered more appropriate for the research setting. Subsequently in order to improve response rates, multiple delivery methods were adopted and questionnaires were administered via direct delivery/retrieval, mass mailing and email. Table 3.4 shows the number of questionnaires distributed through each delivery method. 520 questionnaires were administered directly to respondent organisations with the assistance of specifically recruited distributors. 100 questionnaires were distributed by mailing copies to organisations through a courier mail service (respondents were required to send questionnaires by mail back to a designated post mail bag). 450 questionnaires were also sent to different organisational email addresses.

200 questionnaires were retrieved representing a response rate of 18.6%. Questionnaire administration was done by distributing questionnaires to each geo-zone as shown in Table 3.4. Figure 3.6 shows the distribution of industry sectors of respondents. A Research Consent Form (Appendix 3E) and covering letter (Appendix 3F) were sent to respondents with the questionnaire.

## 3.9 Quantitative data analysis methods

### 3.9.1 Data coding, recording and cleaning

Data coding involves generating a set of rules for allocating numbers to variables, in preparation for data analysis (Neuman, 2006). Data collected from questionnaires were coded for input into an Excel® database.

*Table 3.4 - Questionnaire distribution according to Nigerian geographical zones*

| ZONE | NO. OF QUESTIONNAIRES DISTRIBUTED |
|---|---|
| **DIRECT DELIVERY (Total)** | **520** |
| Lagos | 280 |
| South West | 20 |
| South East | 50 |
| South South | 50 |
| North Central | 80 |
| North East | 20 |
| North West | 20 |
| MASS MAILING | 100 |
| E-DISTRIBUTION | 450 |
| **TOTAL DISTRIBUTED** | **1070** |

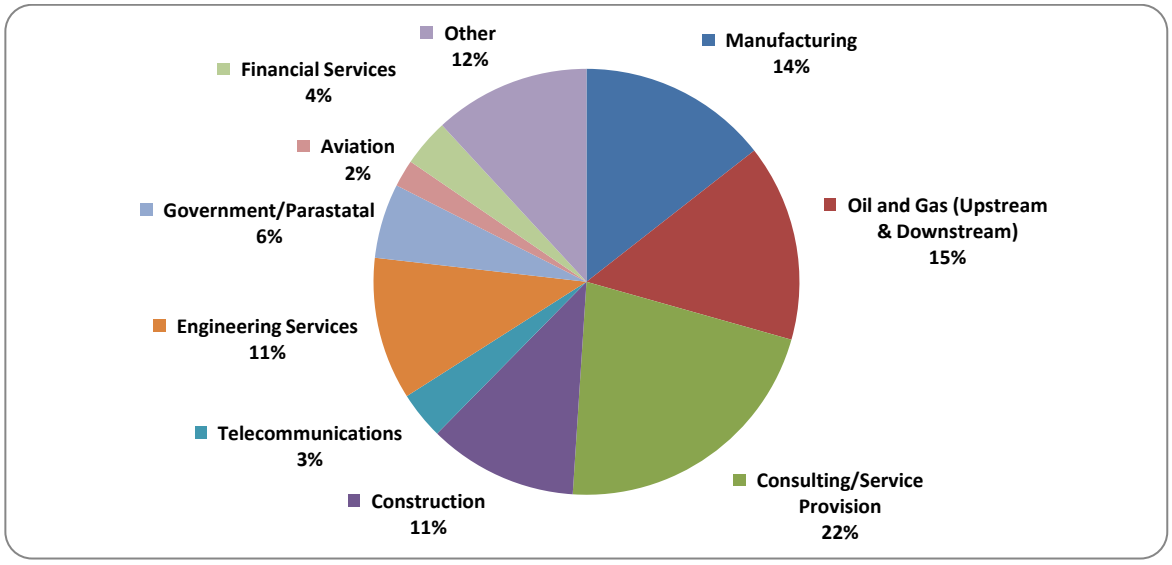



*Figure 3.6 – Industry sector distribution of respondents*

A coding procedure was developed detailing numerical values assigned to each measured variable in the research questionnaire. Data recording and cleaning were performed using Microsoft Excel (2013 version). Data collected were cleaned before entry into the SPSS software (version 20). Data cleaning was undertaken by removing incompatible components from data such as non-numerical symbols, formatted cells, spaces and text (Wiredu, 2014).

### 3.9.2 Statistical analysis testing

Statistical analysis involves descriptive and inferential approaches. Descriptive statistics simply report data in various standardized forms without making conclusions or assumptions. Inferential statistics involve the computation of a number of mathematical procedures from information given in a data sample, in order to make informed guesses about the entire population (Lane, 2011).

### 3.9.3 Parametric and non-parametric data analysis

The choice of statistical test(s) used is dependent on the nature of data collected. Data distribution can be said to be parametric (normally or evenly distributed) or non-parametric (skewed). Parametric data are best suited to descriptive analysis methods using measures of central tendency (mean, median, mode) and measures of variation (range, percentile, standard deviation), and inferential analysis methods such as regression coefficients, which assume that the variability between compared samples is similar. In parametric data analysis, the absolute value of data is important, as these statistics analyse the distances between numbers in a data set and the mean or each other, and then attempt to fit these distances into a theoretically normal distribution (van Emden, 2008). However, since parametric statistical analysis methods are based on a quantitative theoretical distribution of data, they are likely to produce unreliable results if used on non-parametric data, which is fundamentally not normally distributed.

Conversely in non-parametric statistical analysis the absolute value of data is not important and data are not required to follow a normal distribution. Non-parametric statistical testing is particularly useful in two situations – when groups of data being compared have widely

different distributions, and when data are ordinal i.e. presented in numbered ranks different from its original form. Because data are replaced with numbered ranks, some information about the magnitude of the difference between scores may be lost during non-parametric data analysis (Field, 2013).

However, in general, data sets are primarily classified as continuous or categorical, and this classification influences the choice of statistical test used even more that the nature of data distribution. Continuous data can be measured on a scale, and categorical data are presented in categories or groups which are either unrelated (nominal) or ranked (ordinal). As with parametric and non-parametric data distributions, different statistical testing methods are appropriate for data which is categorical or continuous in nature. Continuous data can be statistically analysed with a combination of parametric and non-parametric tests, but categorical data tends to be considered for non-parametric (skewed) data analysis only because it cannot be tested for normality assumptions.

Data collected through questionnaires and presented in research chapters 5 and 7 were primarily categorical in nature, specifically of two categorical types - nominal and ordinal. The questionnaires used Likert scale responses and, as such, were considered appropriate for categorical data analysis. Descriptive statistics for data were therefore presented in the form of frequencies and not measures of central tendency. This is because categorical data have no meaning beyond the categories into which actual data are grouped and, as such, values like the mean and standard deviation cannot be calculated. Furthermore, as data variables were categorical, distribution assumptions could not be tested for normality leading to the preference for non-parametric data analysis methods.

### 3.9.4 Pearson's Chi square test (and contingency table analysis)

The Pearson's Chi-Square test is an appropriate statistical significance testing method for use with categorical variables, and is recommended for its usefulness in determining statistical significance or analyzing two or more groups of categorical variables (McCrum-Gardener, 2008). This test is used to determine statistical significance in data which can be divided into groups or partitions i.e. data in the form of frequencies (van Emden, 2008). The test statistic is

defined as the square of the difference between an observed number and an expected number, divided by that expected number. Data are presented in an 'RxC' table of rows and columns. Due to its suitability, this test is used in analyzing groups of categorical variables for this type of research.

However, certain assumptions must be met when analyzing with the Pearson's Chi-square test. The first assumption is independence, requiring that each respondent (in this case) has contributed only once to the contingency table. Data within this research meet the independence criteria, because respondents were required to respond only once to each question. The Chi-square test also has minimum size restrictions for frequencies of expected counts, as the test assumes that samples are densely distributed across cells. For valid results to be produced, no expected counts should be below 5 when analyzing two variables with two categories i.e. in a 2x2 contingency table. If more than two variables are being analysed, then no expected counts should be less than 1, and no more than 20% should be less than 5. A failure to meet the assumptions of the Chi-squared test results in a disintegration of the chi-statistic and a substantial loss of test power. Analyzing categorical variables from this research with the Chi-square test revealed that expected counts below 5 ranged from 40 – 80%, making the p-value emerging from the test unlikely to be trusted.

An alternative (or supplement) to the Chi-squared test which addresses the problem of low frequencies of expected counts is the Fischer's Exact test, a type of exact test. Exact tests provide accurate significance levels without making assumptions that may not be met by small samples, larger contingency tables or larger samples, which may have low, sparse or zero frequencies in table cells. These tests do not use the asymptotic approach used by other significance tests like the Pearson's Chi-square test, and always produce an exact and reliable significance value regardless of the nature and distribution of the data. The Fischer's Exact test is typically used for analyzing two variables with two categories (Field and Wiredu, 2008), but can also be used for larger samples. However, with the Fischer's Exact test, there are instances when the data set may be too large for the test to produce significance p-values, while not meeting the assumptions for asymptotic tests like Pearson's Chi-square. This may result in a prolonged delay in software processing times and an inability to calculate results. The Monte Carlo method is useful in these instances for providing accurate significance p-

values. It uses a repeated sampling approach by repeatedly checking a specified number of contingency table options to obtain an unbiased and accurate p-value (Mehta and Patel, 2011).

A tiered approach was taken in selecting the statistical test for calculating significance p-values in this research, by calculating p-values using all three tests – the Pearson's Chi-square, Fischer's Exact and Monte Carlo method. From observation, the exact test qualified the Pearson's Chi-square p-value by providing a more accurate and reliable p-value. However, the Fischer's Exact test was not considered the most suitable test as it is computationally intensive and gave inaccurate values or error problems such as long computation delays while obtaining results for every p-value. The Monte Carlo method was found to be less computationally intensive and consistently provided more useable p-values, which were more closely related to the Pearson's Chi-square p-value. Subsequently, test statistics and p-values computed from both the Pearson's Chi-square test and the Monte Carlo method were reported in Chapter 5, with the Monte Carlo p-value being selected as the more acceptable result.

## 3.10 Qualitative data analysis methods

### 3.10.1 Nature of qualitative data

Qualitative data differs from quantitative data in that its meaning is derived from words and not numbers. Because of its richness, the nature of qualitative data has a substantial impact on the way in which it is analysed. Researchers analyzing qualitative data must successfully interpret the inherently subjective meanings expressed by respondents. Qualitative analysis involves the careful exploration, synthesis and transformation of information in order to make inferences on its true meanings. This process is further elucidated by the organisation of data into grouped themes, from which inferences relating to research objectives can be made (Saunders et al., 2012). Qualitative data were collected through the survey questionnaire and interviews on information such as:

1. Organisational details e.g. address, contact person's job description, department etc.
2. Open opinion on the meaning of environmental performance to an organisation (Open-ended answer)

Qualitative analysis was carried out only on data directly relevant to research Objective No. 6 i.e. "To identify organisational views on environmental performance and critically analyse perceptions of environmental performance in a developing country context".

### 3.10.2 Qualitative data

Qualitative data on respondents' views on the concept of environmental performance was collected through questionnaires and telephone calls. Telephone calling was use as a supplementary method of collecting information on environmental performance.

The risk of subjectivity in responses exists in the collection of qualitative data. Researchers have and may exercise a strong influence and bias over respondents as a result of their background or expectations. Canell et al (1981) reported from prior studies three ways in which researchers can influence respondents when collecting qualitative information. Researchers may have role expectations, where they cast respondents into certain roles and expect them to answer questions accordingly; they may have attitude structure expectations, expecting their respondents to maintain consistency throughout answers; and they may have probability expectations where they expect respondents to respond in a specific way as a result of their belief about the population. For instance, in asking respondents about views on environmental performance, the researcher may be influenced by their own preconceived notions about environmental performance, and may expect the respondent to respond in a pre-determined manner, creating a bias in responses.

Qualitative data was collected by asking respondents exactly the same question each time, without varying wording. The open-ended question was asked in a neutral tone and all forms of response were welcomed. No attempt was made to explain the open-ended question in order not to influence responses. Also, the verbatim recording of respondent responses reduced the likelihood of any bias.

Generally, the recording of qualitative data is also a challenge, since it is difficult to effectively capture all verbal information given by the respondent. Challenges with bias and

qualitative data capture were addressed by using voice recording software to record telephone calls. Telephone conversations were then transcribed.

### 3.10.3 Qualitative data coding

In order to analyse qualitative data, key words within responses are coded and quantified. Coding is the process of organizing qualitative data into codes or 'grouped topics'. Codes may be based on themes/topics, ideas/concepts, terms/phrases or keywords related to the subject area. The approach taken to coding qualitative data may be either deductive or inductive. A deductive approach is based on the use of existing theory as a benchmark for analysis, whereas an inductive approach seeks to build theory which is grounded within the data. Inductive coding involves discovering important patterns in the data with no previous assumptions or hypotheses. Based on the nature of qualitative data collected and the objectives for collecting data in this research, a deductive coding approach was used to code and analyse data.

As this method of coding is influenced by the analyser's personal beliefs and biases, these beliefs along with preconceived notions on environmental performance had to be carefully taken into consideration during analysis. Qualitative data was read and interpreted in light of the researcher's preconceptions and biases.

# CHAPTER FOUR

# DEVELOPMENT OF A NEW MODEL FOR CATEGORISING FACTORS AFFECTING PRO-ENVIRONMENTAL BEHAVIOUR (EMSIFs)

## Structure of Chapter Four

## 4.1 Introduction

Existing EMS categorisations models, though useful in analyzing EMSIFs for pro-environmental behaviour in organisations, have fundamental gaps. The absence of a commonly applicable categorisation model makes the identification and comparison of EMSIFs across geographic and economic regions difficult. Subsequently, a consolidation and synthesis of existing categorisation systems would be useful in creating a new model integrating major EMS categorisation divides. Such a model would provide for the grouping and analysis of EMSIFs in different geographical, economic and functional regions, a function which is difficult for existing models to perform.

## 4.2 Research objectives

The aim of this study is to critically evaluate factors affecting pro-environmental behaviour and to investigate environmental performance as its intended result. The objectives of the first research chapter (Chapter 4) are to:

1. To develop a new model for the categorisation of factors affecting pro-environmental behaviour (EMSIFs) across geographical and economic boundaries;
2. To apply, test and critically evaluate the newly developed model by comparing it with existing models for categorising EMSIFs;

## 4.3 Review of the literature - An overview of EMS implementation factors – drivers, benefits and barriers

### 4.3.1 Types of pro-environmental drivers

**1. Internal pro-environmental drivers**

Internal drivers play an integral part in the determination of corporate pro-environmental behaviour. Previous studies have shown that organisations, in determining pro-environmental behaviours are often motivated by factors stemming from within the organisation, such as internal resources and capabilities (Darnall et al., 2008). Some of the most influential internal

drivers of environmental change in today's organisation include corporate awareness of the finite nature of natural resources, and the need for maintaining a sense of stewardship and responsibility towards environmental issues (Gavronski et al., 2008). According to Zorpas (2010), an EU survey of organisations reported businesses as saying that they were motivated to undertake environmental activities as a result of internal drivers such as their personal views and good business practice, in addition to other motivating factors. Apparently, though many organisations appear to be controlled by external motivations, there are also internal forces which drive pro-environmental behaviour. Based on results of previous studies (Tomer, 1992; Bansal & Howard, 1997; Bansal & Roth, 2000; Jiang & Bansal, 2003; Edwards, 2004; Neumayer & Perkins, 2005) the following categorisations for types of internal pro-environmental drivers can be derived:

1. The organisation's market: This can be described as drivers stemming from how the organisation views its market from an internal standpoint, based on its attempts to gain competitive advantage and generate profit
2. Innate organisational characteristics: Drivers stemming from an organisation's internal environment
3. The social internal environment: Factors such as moral or corporate responsibility, environmental stewardship and innovation.

**a) The organisation's market**

An organisation's internal desire to thrive in its market can place immense pressure on it. From an internal point of view, market relevance and the potential of attaining increased market presence are all-important targets for organisations. As environmental credibility is considered to be a factor in determining competitiveness, both on local and international scales, organisations demonstrate pro-environmental behaviour in an attempt to gain prominence in their respective markets. In particular, certain types of pro-environmental behaviour, for instance, external EMS certification provide an opportunity for organisations to demonstrate environmental initiatives outwardly. This may confer legitimacy and market acceptance on these organisations. Furthermore, some studies have shown that pro-environmental behaviour such as EMS implementation is found to be instrumental in the achievement of increased profits, improved process efficiencies, lowered costs and improved

corporate image (Sambasivan & Fei, 2007). These expectations may compel organisations to show pro-environmental behaviour in a bid to attain these benefits.

**b) Drivers stemming from organisational characteristics**

Studies (Bellesi et al., 2005; Curkovic et al., 2005; Tan, 2003; Zorpas, 2010) suggest that innate organisational characteristics may predispose an organisation towards exhibiting pro-environmental behaviour and adopting an EMS. Organisational characteristics like the organisation's ownership structure (e.g. as in the case of multinational or foreign-owned organisations), organisation's size (e.g. as with large organisations), existence of enabling processes (such as cross-functional teams and management), the presence of other management system certifications (e.g. ISO 9001 or QS 9000) and the organisation's established values, ethos or reputation may predispose that organisation to demonstrate pro-environmental behaviour by adopting an EMS (Bellesi et al., 2005; Cashore et al., 2005; Curkovic et al., 2005; Delmas, 2002; Tan, 2003). Organisational characteristics are also related to their economic status, as richer organisations are likely to control more resources. These organisations may therefore be more likely to demonstrate pro-environmental behaviour.

**c) Social internal environment**

Organisations may also be internally driven towards pro-environmental behaviour as a result of other factors including: i) a sense of corporate citizenship, environmental stewardship and desire to reduce environmental footprint and improve performance through means such as investment in environmental research and development (Darnall et al., 2008; Massoud et al., 2010b; Tan, 2003); ii) the desire to internally motivate employees by demonstrating environmental stewardship through utilization of EMS standards as an internal marketing tool (Chan & Hawkins, 2010); iii) organisational proactivity to go beyond basic expectations by developing and implementing environmental initiatives geared at improving environmental performance (Pauraj & de Jong, 2010); and iv) a public demonstration of environmental responsibility (Delmas, 2002; Gonzalez et al., 2008; Massoud et al., 2010a). The existence of such EMS drivers belies the popularly held notion that organisations are simply motivated by

financial profits and will only exhibit pro-environmental behaviour if compelled to do so by external and independent motivations.

## 2. External pro-environmental drivers

Organisations are increasingly influenced by external factors that compel them to play more active roles in environmental management. Opportunities in the market, government and regulatory influences, institutional pressures and community pressures all now have influence on the way organisations manage their environmental interactions, especially in more developed societies. EMS implementation is a good way of demonstrating improved environmental performance (Bellesi et al., 2005; Jiang & Bansal, 2003; Sambasivan & Fei, 2007; Zorpas, 2010). This is particularly important in societies where the public is enlightened and environmentally conscious. Firms which experience limited external pressure from outside institutions have little motivation to adopt pro-environmental behaviours, and usually adopt EMSs as a result of internal inducement (Bansal and Bogner, 2002; Jiang and Bansal, 2003; Cashore et al., 2005; Zorpas, 2010). The precedence of external EMS drivers over internal EMS drivers in determining pro-environmental behaviour still presents a point of disagreement in EMS studies. The premise proposed by some studies that organisations implement EMSs mainly as a response to external pressures is in contradiction with those studies that claim that internal factors also play in important role. The need to distinguish the importance of internal EMS drivers separately from external drivers presents an opportunity for further research. Both forms of motivation appear to play important roles in influencing organisations. External environmental drivers can be grouped into the following broad categories:

a) The organisation's market: The market from an external point of view
b) The external social environment: Influencing factors and institutions outside the organisation
c) The regulatory environment: Regulatory influences operating around the organisation
d) Other external drivers: Including intra-industry pressures, regional drivers.

### a) The organisation's market

According to Curkovic, Sroufe and Melnyk (2005), there is a causal relationship between an organisation's direct exposure to the end-customer and its interest in environmental initiatives. An important aspect of the external impact of the market on organisations is export orientation. Organisations believe that, in order to gain increased access to international markets, they must improve their environmental performance and openly demonstrate environmental stewardship. Some organisations are said to purposely subscribe to environmental certifications because they are a requirement in markets which they intend to penetrate (Delmas, 2002). The importance of export orientation in determining an organisation's pro-environmental behaviour is especially evident in organisations doing business with eco-sensitive countries such as Finland, Germany and Denmark in the EU (Massoud et al., 2010a; Nishitani, 2009) and other environmentally sensitive markets such as Japan. Markets in environmentally sensitive societies have been known to refuse to transact business with foreign counterparts as a result of a failure to meet required environmental standards. This acts as a strong driver on foreign organisations to boost their environmental image in a bid to obtain business from organisations in more developed, environmentally sensitive markets through EMS adoption. This driver is evidenced by the high number of certifications in countries which supply developed markets like in China (Mohammed, 2001; Nishitani, 2009). A criticism of this EMS driver is that implementing organisations adopt EMSs or seek environmental certifications simply as an outward demonstration of 'environmental responsibility', and not as a result of an inherent desire to proactively address operational environmental impacts. In particular, this is a problem with ISO 14001:2004, which tends to be bureaucratic and process-oriented rather than performance driven. However, the current draft of ISO 14001:2015 places greater emphasis on outcomes rather than inputs in environmental management, and is likely to assist more in efforts towards environmental improvement/stewardship.

External market pressures are also demonstrated through an organisation's supply chain, as seen by the pressures placed by larger environmentally-certified organisations on their suppliers (Gonzalez et al., 2008). According to Gonzalez et al (2008), there is causality between an organisation's improved environmental practices and its tendency to require its

suppliers to follow suit. Organisations, by succumbing to these external market pressures, are able to bestow greater social legitimacy on their environmental programs (Darnall et al., 2008). Unfortunately, external market pressures exerted on organisations are very real and can be very powerful. These pressures strongly influence organisational behaviour, and produce pro-environmental results for the wrong reasons. A possible result of this external motivation is that organisations will tend to focus on the mere existence of outward displays of environmental stewardship, and not on actually improving performance.

**b) The external social environment**

Broad and direct (macro and micro) social influences both have an impact on organisations (Tomer, 1992). Macro social drivers include community and societal influences, public concern, the goals and unique demands of society and its (society's) desire for better environmental performance of organisations. Micro social drivers include external institutions such as environmental consultants/organisations, community groups, labor unions, trade associations and standard industry practices. These social entities, as a result of more widely available information, are now more environmentally conscious and have altered societal norms and tolerance levels. Social entities exert pressure on organisations to be more environmentally proactive. Social pressure is demonstrated by communities, labor unions and trade unions by way of protests and boycotts in response to the incidence of behaviour considered unacceptable by society. An organisation's external shareholders also exert social pressure on it to exhibit good pro-environmental behaviour, in a bid to have the organisation avoid financial burdens associated with environmental liabilities (Darnall et al 2008).

Social pressures can also lead an organisation to pay mere lip service to environmental performance, causing them to adopt EMSs without really attempting to improve internal operations. Specifically, EMS certification standards have faced the criticism of being used as image building tools by organisations, with claims that they do not result in appreciable improvement in environmental performance (Bansal & Hunter, 2003; Boiral, 2011). The tendency to use EMS standards as public relations tools is more likely to be heightened by the existence of a large number of social influences. This may create a counter-productive situation in which society, rather than achieving its intended objective of improved

organisational environmental performance, inadvertently motivates organisations to adopt a form of environmental practice that is largely superficial and thus, ineffective.

### c) The regulatory environment

The attempt to control organisation's activities through command-and-control mechanisms is widely used by regulatory authorities. Regulatory pressure involves the promotion of pro-environmental behaviour such as EMS implementation and the mandating of environmental actions. Required actions may range from target-oriented pollution reduction to declaration of emissions to authorities (Delmas, 2002; Hoffman, 1997). Regulatory environments put substantial pressure on organisations by mandating compliance to environmental regulation, and may be seen as the most effective form of motivation for pro-environmental behaviour. However, organisations compelled solely by regulatory pressures may be more likely to adopt more superficial environmental practices as compliance may be sought merely to keep regulators away. Additional regulatory forces which, according to Tomer (1992), may influence a firm's pro-environmental behaviour include regulators' administrative operations, such as the time it takes regulators to communicate and interpret environmental regulations to organisations and respond to queries from them, and the bureaucratic delays and uncertainties which environmental regulatory operations may cause. These usually produce a negative impact on pro-environmental behaviour, as organisations may deliberately keep away from regulators in an attempt to avoid bureaucracy, which can in turn stagnate environmental activity and negatively impact on an organisation's desire to deal with regulators (Tomer, 1992).

### d) Other external drivers

*i. Sector-specific pro-environmental behaviour* - The industry in which an organisation operates may predispose it towards pro-environmental behaviour, such as the adoption of EMSs. Organisations, in an attempt to keep up with industry trends may adopt EMSs, as shown by the Massoud et al (2010b) study of Lebanese firms, which demonstrated that one of the most influential drivers motivating organisations in the food industry to adopt EMSs was 'keeping up with industry trend'. Furthermore, organisations in some sectors (e.g. natural resources) are more likely to be environmentally proactive than in other sectors (Zorpas,

2010), as the degree to which organisations implement environmental measures is dependent on the extent to which they believe their operations impact on the environment.

*ii. Company image from an external perspective* - The need for publicly visible organisations to adopt EMSs to demonstrate environmental performance appears to have grown, with organisations admitting to seeking the public recognition and better corporate image that accompany EMS implementation and certification (Gonzalez-Benito & Gonzalez-Benito, 2008; Zutshi & Sohal, 2004). In support of this, Jiang and Bansal (2003) have reported that organisations with externally visible operations adopted third party environmental certifications in an attempt to gain public recognition and validate or clarify their environmental performance. This indicates that there is a directly proportional relationship between corporate environmental management and public perception, with attempts at environmental management increasing with increased public pressure. However, environmental management efforts put in place simply to respond to public perception may not be firmly entrenched within organisations, making it difficult for them to demonstrate tangible environmental performance.

### 4.3.2 Types of pro-environmental benefits

Much of the literature on the quantitative and qualitative effects of pro-environmental behaviour such as EMS implementation, points to a number of commonly accepted benefits which may be derived by organisations (Bansal & Bogner, 2002; Zutshi& Sohal, 2004; Gavronski et al., 2007; Heras et al., 2010; Franchetti, 2011). The major benefits of EMS implementation and other environmental initiatives are detailed below.

**a) Impact on human resources**

Employee involvement is usually practiced by organisations that demonstrate pro-environmental behaviour. Formal EMS standards place requirements on certifying organisations to involve employees in the EMS implementation process. For instance the EMS implementation standard ISO 14001:2004 requires organisations to '…ensure that persons performing tasks for it …. that have a potential to cause a significant environmental

impact … are competent on the basis of appropriate education, training or experience' and also to '…establish, implement and maintain a procedure to make persons working for it…. aware of significant environmental aspects and potential impacts associated with their work …… and their roles and responsibilities in achieving conformity with the requirements of the EMS' (ISO, 2004). Employee involvement is a fundamental aspect of the EMS process, making it difficult for organisations to exclude their employees from the decision to implement an EMS, and consequently easier for implementation to have a positive influence on employees. EMS implementation also gives employees ample opportunity to take responsibility for the choices that will lead to the attainment of environmental goals. In so doing, employees encounter genuine challenges which are likely to lead them to the development of innovative solutions. These interactions can result in the bolstering of team spirit and loyalty amongst employees. As employees become more aware of environmental issues within an organisation, attitudes and behaviour also change (Jiang & Bansal, 2003; Link & Naveh, 2006; Sambasivan & Fei, 2007). However, if EMS implementation is presented as merely a business strategy to be used to gain competitive advantage, there may be a consequent negative impact on employee morale (Chan & Hawkins, 2010), with employees viewing organisations as being solely concerned with profitability . However, the positioning of a company in its respective market may also have an impact on employee opinion. In companies with a favorable market position, EMS adoption is likely to positively affect employees when they genuinely believe that the organisation is making the decision to implement an EMS for what is considered to be the right i.e. ethical reasons. In organisations with a poor market position, employees may be convinced to consider EMS adoption in the light of its market related benefits including competitive advantage, reduced operational costs, improved corporate image and increased profitability.

**b) Legal, regulatory and industry compliance**

Much emphasis is placed by EMS implementation standards on compliance with legal, regulatory and industry requirements, to which certifying organisations must adhere. Organisations with EMSs are not only fully aware of their environmental legal and statutory requirements, they also have to, in order to maintain certification, put processes in place to ensure they operate within those requirements (Zorpas, 2010). This also applies to

organisations with uncertified EMSs and to those demonstrating less structured forms of pro-environmental behaviour. Pro-environmental behaviour through EMS implementation produces regulatory benefits by improving relationships between implementers and regulators and by the direct avoidance of compliance breaches. Organisations with good relationships with regulators may also benefit from any existing regulator-driven programs, such as reward schemes which adopt a 'lighter touch' approach towards organisations with good compliance records by subjecting them to fewer regulatory inspections and audits.

**c) Economic impacts**

There is a positive relationship between EMSs implementation and cost savings for organisations. This occurs as a result of economic benefits from reduction in material and resource consumption, less pollution, process intensification and improvement, improved waste management and productivity, all of which will typically result in cost reductions (Bansal & Bogner, 2002; Sambasivan & Fei, 2007; Curkovic & Sroufe, 2011; Jabbour et al., 2012). However, though EMS supporters argue that cost savings exceed implementation costs, thereby benefiting both the organisation and the environment (Bansal & Bogner, 2002), it is still unclear if EMS implementation savings actually bring about tangible improvement in environmental performance. A reason for this may be that economic benefits are not a reliable indicator of environmental efficiency, as cost savings can be achieved without reducing environmental pollution, and the amount of costs saved depends on several factors which may be independent of EMS implementation (Curkovic & Sroufe, 2011; Hertin et al., 2008). The economic impact of EMS implementation, however remains fundamental in organisations' decision to adopt an EMS, as managers are not likely to patronize EMSs if they do not have an anticipated positive impact on financial bottom-line. Similarly, organisations are less likely to adopt any form of pro-environmental behaviour if the tangible benefits are not readily identifiable and obtainable.

**d) Market access**

One of the most compelling and convincing benefits of pro-environmental behaviours is their ability to provide organisations with access to new and existing markets. Pro-environmental behaviour in the form of EMS certification is the most recognizable and authentic 'green' passport any organisation can hold, regardless of its geographical location or industry, as EMS

certifications afford organisations the ability to sell to customers (Bansal & Bogner, 2002). This benefit can also be gained by organisations that simply make a more concerted effort at implementing EMS elements. It is obvious that the customer-driven requirement for external environmental validation is becoming an increasing trend as environmental management is now more relevant to conducting international business (Curkovic & Sroufe 2011; Jabbour et al 2012). Adopting an EMS also offers market access benefits to organisations due to their geographical locations. For instance, as a result of more active uptake of EMS standards in Europe, there are added advantages to organisations operating in or intending to penetrate European markets (Bellesi et al., 2005). In a second example, a study by Kehbila et al (2009) examining EMSs in South Africa's automotive industry, claims that certified EMSs have contributed to the industry's excellent image and made industry products (from South Africa) easily marketable to both national and international markets.

**e) External relations and corporate image**

Pro-environmental behaviour has a profound impact on the way an organisation is perceived by external stakeholders, as well as on the relationships between the two. Successful EMS implementation can be communicated to various external parties – customers, suppliers, regulatory bodies, investors and the general public (Curkovic & Sroufe, 2011). This, in effect, sends out an 'economic signal' and simultaneously declares a number of things about the organisation – that it recognizes and takes its environmental responsibility seriously, is committed to improved environmental performance, conforms to surrounding industry and regulatory pressures, and views environmental issues as a fundamental corporate activity. A fall-out of this economic signaling should be an organisational image of legitimacy, credibility and trustworthiness, which is further established when EMSs are externally certified, verified by auditors and supported by extensive documentary evidence. Implementing organisations thereby earn a favorable standing with their local and wider communities, making it easier for them to grow and develop within this important social environment (Bansal & Bogner, 2002; Melnyk, 2002; Sambasivan & Fei, 2007; Oliveira et al., 2011). However, the derivation of external benefits such as improved community relations does not actually imply the existence of genuine environmental performance improvement.

### f) Environmental performance and efficiency

EMS implementation brings about improved environmental efficiency in a number of ways - first a supporting environment is created for the implementation of other environmental practices; secondly, the organisation's ability to identify a greater number of environmental aspects is increased; thirdly the organisation can implement management practices for controlling and improving environmental performance and for reducing negative environmental impacts; and lastly technological innovations within operations that further enable the meeting of environmental demands are stimulated (Radonjic & Tominc, 2007; Gonzalez et al., 2008; Comoglio & Botta, 2011). These efficiency benefits typically should result in cost savings for EMS implementing organisations, but as they may also occur as result of other operational interventions, the direct impact of EMSs on cost savings remains unclear.

### g) Non-environmental benefits

EMS benefits relating to 'non-environmental' issues (organisations' public image and perception, and on relationships with external stakeholders) are more frequently elaborated by research studies and more keenly pursued by organisations than benefits related to core environmental performance or improvement. For instance, in a survey carried out among Swiss firms, only 3 out of 14 EMS benefits identified had a direct relationship with environmental impact – these were risk minimization, certainty of legal compliance and support of ecological transformation of the line of business (Hamschmidt, 2000). Furthermore, in a literature review conducted by Tan (2003), it was concluded that organisations in industrialized nations sought EMS benefits such as effective operations, market expansion, improved profitability and improvement in company image. These benefits have no direct emphasis on environmental improvement.

Tan (2003) also asserts that reviewed studies seemed to convey the message that there was much more to be gained from EMS implementation in addition to environmental preservation. In fact, the benefits of EMS implementation identified from studies are so varied and apparently situational that it appears that EMS benefits may be specific to an organisation. Moreover there are fundamental differences in the perceptions of the benefits of EMSs – with

some studies actively promoting EMSs and the benefits which have been realized for adopting organisations, while others report findings which cast doubt on the ability of EMSs to bring about objective, identifiable and repeated benefits. Apparent differences may exist for a number of reasons. Firstly, the EMS benefits may not be immediately apparent because they accrue over a long term. As such, though implementation costs are very real, benefits may be often more long-term, drawn-out and unseen (Bansal & Bogner, 2002).

Furthermore, few organisations may have a clear understanding of the actual benefits of implementing an EMS (Franchetti, 2011), thus affecting their perception of the benefits. Also, as Kollman and Prakash (2002), Potoski et al (2001) and Hertin et al (2008) argue, the differences in the adoption of EMSs in different national contexts relate to variations in the benefits accruing to organisations.

### 4.3.3 Types of pro-environmental barriers

#### a) The cost-intensiveness of pro-environmental initiatives

There are direct and indirect financial implications associated with pro-environmental behaviours such as EMS implementation, especially in formal EMS adoption. Apart from the direct financial outlay arising from auditing, certification and engagement of consultants, there are indirect costs from factors such as the allocation of human resources and time spent on implementation activities, which both inevitably translate back into financial costs (Chan & Hawkins, 2010). As the costs of EMS implementation have been known to be significant, they can only be incurred by organisations that can afford it (Chan & Hawkins, 2010; Curkovic et al., 2005; Jiang & Bansal, 2003; Zorpas, 2010). For instance Jiang and Bansal, (2003) report that, according to the Global Environmental and Technology Foundation, the total initial cost of ISO 14001 implementation per facility ranges from $24,000 to $128,000, with an annual maintenance cost of between $5,000 and $10,000).

There is also an additional concern that a substantial portion of costs incurred during EMS implementation may be non-returning or non-value adding, especially in organisations that have sought EMSs mostly for market acceptance or regulatory compliance reasons (Sambasivan & Fei, 2007). Unfortunately, the high costs of undertaking EMS implementation is often dimly perceived by organisation's investors, whose interest lies in the primary

purpose for which organisations are in business – to realize profits. This is especially true in the case of externally certified EMSs, which may lead many managers to question the value of external seals, particularly when some schools of thought propose that all benefits achievable by an externally certified EMS are equally achievable by effective non-certified or self-declared EMSs. In practice, many organisations may find that environmental initiatives do not yield the expected gains (Bansal & Bogner, 2002; Jiang & Bansal, 2003; Paulraj & deJong, 2011). A perception that EMSs have not met expectations may occur as a result of unreasonably high expectations on the part of implementers, or the fact that EMSs tend to yield benefits in the longer run rather than immediately.

**b) Insufficient links to environmental performance**

Arguably the most commonly touted criticism of EMSs and many other pro-environmental initiatives is that they are not sufficiently linked to environmental performance. As many EMSs mainly focus on management interventions required to implement a functional EMS and do not have any inherent performance indicators or measurement metrics they cannot be referred to as performance measures but rather as management measures (Bansal & Bogner, 2002; Delmas, 2002; Zorpas, 2010). A specific barrier to implementing externally certified EMSs may be the impression that certified organisations inadvertently attract greater attention and expectation with regards to their standard of environmental record keeping and performance. For instance, in its attempt to be relevant to organisations in all industries, ISO 14001 is criticized as being insipid and document-driven, especially with organisations simultaneously complying with other more stringent industry operating standards (Bansal & Bogner, 2002; Curkovic et al., 2005). In general, pro-environmental behaviours do not meet expectations if they cannot achieve the original objective for which they are implemented.

### 4.3.4 The relationship between EMS implementation factors

EMS drivers, benefits and barriers are collectively referred to as EMS implementation factors (EMSIFs), as they all have interactions with implementing EMSs and can be commonly categorised. According to Zutshi and Sohal (2004), EMS drivers and benefits are linked. This is true of the link between EMS drivers and barriers, as an EMSIF driving an organisation to display pro-environmental behaviour may also bar another from adopting the same.

Table 4.1 demonstrates how EMSIFs may serve multiple functions as drivers, benefits and barriers to pro-environmental behaviour in organisations. For instance, regulatory and legal demands in the form of command-and-control mechanisms and associated voluntary programs can serve as a powerful driver of pro-environmental behaviour in general, and EMS implementation in particular in organisations (Henri & Journealt, 2007; Melnyk et al., 2002; Tomer, 1992). This EMS driver can motivate organisations to adopt EMSs in an attempt to seek compliance with regulatory standards or rules and to achieve subsequent regulatory relief. Simultaneously, regulatory and legal demands in the form of government or regulatory agency bureaucracy and inadequate laws can also act as a barrier to EMS implementation (Massoud et al., 2010b; Tomer, 1992). In this way, regulatory and legal demands can simply be referred to as an EMSIF, as it has a number of interactions with pro-environmental behaviour and can influence it in different ways.

*Table 4.1 – Relationship between EMS implementation factors*[6]

| EMS Implementation Factor | EMS Driver | EMS Benefit | EMS Barrier |
|---|---|---|---|
| Regulatory/legal demands/pressure | √ | √ | √ |
| Market advantages | √ | √ | |
| Customer/client requirements | √ | | √ |
| Opportunity for new approach in environmental management | √ | √ | |
| Employee relations | √ | √ | |
| Resources (Human, economic, infrastructure) | √ | | √ |

### 4.3.5 EMSIFs categorisation models from previous research studies

#### a) EMSIF driver categorisation models

Studies on organisational behaviour and motivations, especially as affecting environmental behaviour argue along differing theoretical, functional and geographical perspectives.

[6] The EMSIFs in this table are extracted from the EMS research questionnaire administered during data gathering

Theoretically, two constructs are presented, in which organisations are either seen as rational entities that make decisions based on objectivity and profitability, or as being induced to make decisions as a result of social influences.

Studies based on the rational perspective suggest that organisations are solely motivated by identifiable forces which encourage them to adopt pro-environmental behaviours like EMS adoption. These forces, often termed differently, portray the organisation as responding to forces seeking to control its behaviour.

Controlling forces include three different external pressures – coercive pressures (pressures which apply when organisations are 'forced' to respond by compulsion), mimetic pressures (pressures in operation when organisations attempt to mimic the behaviour of other organisations) and regulatory pressures (which stem from the direct impact of regulators on an organisation). According to this perspective, organisations are primarily motivated to exhibit different behaviours as a result of a desire to respond to market drivers, achieve traditional business objectives and maximize profit within a neoclassical business model (Jiang & Bansal, 2003; Powell & DiMaggio, 1991).

However, opposing theoretical perspectives on organisational motivations claim that organisations are not merely affected by the traditional incentives promoting pro-environmental behaviour within a neoclassical model i.e. market incentives and regulatory influences. These studies suggest that organisations, in addition to traditional pressures, are increasingly motivated towards environmental behaviour as a result of factors such as the internal capacities and environmental opportunities open to them and the broad and direct social influences operating on each organisation (Bansal & Howard, 1997; Bansal & Roth, 2000; Darnall et al., 2008; Jiang & Bansal, 2003; Neumayer & Perkins, 2005; Tomer, 1992).

A number of other EMS categorisation models classify EMS drivers from more functional and geographical perspectives. According to these, organisations experience motivation because of the major practical activities in which they are engaged, and the various impacts they create. As such, motivations to exhibit pro-environmental behaviour tend to stem from such drivers as: (i) the organisation's market, which comprise the forces affecting its competitiveness, (ii) its ethics, as well as the society affected by its activities, including local communities,

pressure groups and the general public, (iii) the control of management, stemming from within, (iv) financial motivations from financial institutions and, (v) the relational motivational pressures arising from the organisation's sense of duty and responsibility in complying with regulation (Bansal & Howard, 1997; Bansal & Roth, 2000; Darnall et al., 2008; Edwards, 2004; Jiang & Bansal, 2003; Neumayer & Perkins, 2005).

Classifying EMS drivers solely along functional lines introduces variations in interpretation, as organisations have different functional approaches and differing operational activities. Functional EMS driver groupings also do not provide a complete perspective of all sources of motivation affecting organisations because of differences in functional aspects such as market, management and external environment. Geographical divides also exist in the categorisation of EMS drivers, with EMS studies identifying the existence of an internal-external construct within organisational motivations. According to this perspective in a geographical context, organisations are encouraged to exhibit pro-environmental behaviours by both internally and externally generated motivations (Heras & Landin, 2010; Heras et al., 2011; Neumayer & Perkins, 2004). Classifying EMS motivations using a geographical perspective provides a means by which all possible sources of motivation affecting an organisation may be included. This is primarily because, following this line of reasoning, organisations have only two 'geographical' environments – the internal (within organisations functions, operations and influence) and the external (outside organisations functions, operations and influence) environments. EMS driver categorisation models are shown in Table 4.2.

### b) EMSIF benefit categorisation models

Previous EMS studies have also used different categorisation models in grouping the benefits of EMS implementation, as shown in Table 4.3. Similar to studies focusing on EMS driver categorisations, these studies identify a number of different benefits accruing from EMS implementation. However, though there are differences in nomenclature and variations between benefit categorisation models, some common themes can be identified. For instance, several studies identify benefit categories in which organisations make material or economic gains from EMS implementation (Curkovic & Sroufe, 2011; Gavronski et al., 2008; Tan, 2003; Matsuzak-Flejsman, 2008; Zorpas, 2010; Zutshi & Sohal, 2004).

Though named differently by varying studies, this benefit categorisation implies that EMS implementation leads to tangible, quantifiable (and often financial) benefits. Another commonality in EMS benefit categorisation, according to studies, is that organisations generally gain some form of environmental benefit from EMS implementation. This is evidenced by studies that report environmental gains as being a category of EMS benefits (Curkovic & Sroufe, 2011; Heras & Arana, 2010; Hertin et al., 2008; Tan, 2003; Zorpas, 2010). Another benefit category identified by studies is regulatory benefits. Such studies report improved regulatory compliance and regulator relationships as a benefit of EMS implementation (Heras & Landin, 2010; Hertin et al., 2008).

*Table 4.2 – EMS driver categorisation models from previous studies*

| STUDY | DRIVER CATEGORISATION FROM STUDY |
|---|---|
| Powell & DiMaggio, 1991 | • Coercive Pressures<br>• Mimetic Pressures<br>• Regulatory Pressures |
| Tomer, 1992 | • Marketing Incentives<br>• Social Influences<br>• Regulatory Influences<br>• Internal Organisational Capabilities<br>• Environmental Opportunities |
| Bansal & Howard, 1997 | • Market Drivers<br>• Social Drivers<br>• Regulatory Drivers<br>• Financial Drivers |
| Bansal & Roth, 2000 | • Competitive Motives<br>• Relational Motives<br>• Ethical Motives |
| Jiang & Bansal, 2003 | • Market Demands<br>• Management Control<br>• Institutional Pressures |
| Edwards, 2004 | • Commercial Drivers<br>• Ethical Drivers<br>• Legal Drivers<br>• Economic Drivers |
| Neumayer & Perkins, 2005 | • Internal (or Efficiency) Motives<br>• External (or Institutional) Motives |
| Darnall et al., 2008 | • Market Pressures<br>• Social Pressures<br>• Regulatory Pressures |
| Heras et al., 2010 | • Motivations of an internal nature<br>• Motivations of an external nature |
| Heras & Arana, 2010 | • Internal Drivers<br>• External Drivers |

There is also a geographical perspective along which EMS benefits are categorised. Different EMS benefit categorisations identify internally generated organisational efficiency-type benefits as a distinct category. Organisations gain benefits like improved efficiencies and better management control as a result of EMS implementation. Similar studies also report externally generated benefits like improved corporate image and community relations as a benefit category (Tan, 2003; Zutshi & Sohal, 2004; Gavronski et al., 2008; Matsuzak-Flejsman, 2008; Heras & Arana, 2010; Zorpas, 2010; Curkovic & Sroufe, 2011). However, though these commonalities exist, there is substantial variation between models in terms of nomenclature and category description. Existing benefit categorisation models exhibit differences which may affect the widespread functionality of each of the categorisation models and the interpretation of EMSIFs. Though each perspective has its usefulness in categorising EMS benefits, a consolidation of perspectives within a new model would further increase applicability.

*Table 4.3 – EMS benefit categorisation models from previous studies*

| STUDY | BENEFIT CATEGORISATION FROM STUDY |
|---|---|
| Tan, 2003 | • Competitive advantage<br>• Effective operation and improvement in company image<br>• Environmental benefits |
| Zutshi & Sohal, 2004 | • Tangible benefits<br>• Intangible benefits |
| Matzsuzak & Flejsman, 2008 | • Economically quantifiable benefits<br>• Economically non-quantifiable benefits |
| Matzsuzak & Flejsman, 2008b | • Economic impacts<br>• Operational environmental impacts<br>• Management of environmental impacts<br>• External benefits |
| Hertin et al., 2008 | • Regulatory certainty<br>• Internal/external communication<br>• Environmental performance |
| Gavronski et al., 2008 | • Internal benefits<br>• External benefits |
| Zorpas, 2010 | • Commercial benefits<br>• Internal benefits<br>• Environmental benefits<br>• Communication benefits |
| Curkovic & Sroufe, 2011 | • Resource and cost efficiency<br>• Competition and reputation<br>• Proactive environmental management<br>• Involvement and communication |

### c) EMSIF barrier categorisation models

Fewer studies categorise EMS barriers. These studies provide models for classifying barriers to pro-environmental behaviours like EMS implementation, and again, though differences in terminology exist, there are commonalities in the modes of classification. EMS barriers are mainly categorised along functional organisational and geographical perspectives. Functional perspectives indicate that barriers primarily arise from within organisations' internal operational structures. Structures include internal operational, technological, resource and organisational aspects, which pose challenges to the implementation of pro-environmental initiatives and systems (Boiral, 2011; Rao et al 2006; Zutshi & Sohal 2004). EMS barriers may also arise from geographical perspectives i.e. either the internal or external environment of organisations, but this categorisation has not been extensively covered in literature (Darnall et al., 2008b). Barrier categorisations are shown in table 4.4. Previous research studies have identified EMSIFs affecting pro-environmental behaviour, and some studies have provided models and categorisation systems along which EMSIFs may be grouped. Although a number of EMS categorisation models have aspects of similarity and comparability, there are fundamental differences between many existing models, leading to ambiguity and lack of commonality in classifying EMSIFs.

*Table 4.4 – EMS barrier categorisation models from previous studies*

| STUDY | BARRIER CATEGORISATION FROM STUDY |
|---|---|
| Zutshi & Sohal, 2004 | • Industrial barriers (capital costs, operation configuration, competitive pressures, industry regulations)<br>• Organisational barriers (employee attitude, poor communication, inadequate top management leadership) |
| Lin et al., 1997 | • Technological barriers (unavailability of environmentally-friendly technologies)<br>• Management barriers (unfamiliarity with state-of-the-art environmental practices)<br>• Support barriers (lack of necessary technical expertise) |
| Boiral, 2011 | • Insufficient resources<br>• Inappropriate/excessive documentation<br>• Externalization of implementation process<br>• Lack of follow-up and system continuity<br>• Search for commercial certification |

Furthermore, existing EMSIF categorisation models such as in Heras and Arana (2010) classify specific types of EMSIFs (e.g. EMS drivers, benefits or barriers), limiting their ability to categorise other EMSIF types. For instance, an EMSIF categorisation model which classifies driver type EMSIFs may also be used to classify benefit type EMSIFs, but is not useful in classifying barrier type EMSIFs. Conversely, some categorisation models focus only on the classification of barriers. Other categorisation models, though presenting sub-categories which address additional sources of EMSIFs, do so in a manner which limits the ability of the sub-category to cover a wide range of EMSIFs.

For instance, the 'internal organisational capabilities' category presented by Tomer (1992) though covering an organisation's inherent resources, skills and abilities, does not cover other organisational factors which may affect pro-environmental behaviours such as management commitment (or lack of it), lack of environmental awareness or barriers such as insufficient information or excessive documentation. Some categorisation models also present sub-categories which are broad and general, thereby providing little detail to aid interpretation, for instance categorisation models which classify EMSIFs in the broad categories of 'internal' and 'external' (i.e. Neumayer and Perkins, 2005; Gavronski et al., 2008; Heras et al., 2010; Heras and Arana, 2010), and 'tangible' and 'intangible' (i.e. Zutshi and Sohal, 2004).

In order to address gaps in current EMSIF categorisation models, a model for the re-categorisation of pro-environmental behaviour EMSIFs across geographical, functional and economic boundaries will be developed. This model will better aid the comparison of EMSIFs identified across boundaries in organisations in different world regions, economic regions and industry sectors.

## 4.4 Methods used

The development and validation of the new EMSIF categorisation model involved:

i) The conduct of a literature review examining previous academic content on categorisation methods used for grouping EMSIFs

ii) The identification of distinct categorisation methods and constructs along which EMSIFs have been previously grouped

iii) Cross alignment of EMSIFs categorisation constructs to produce a new, more robust model, functional for categorising EMSIFs identified across geographical, economic and operational planes

iv) Categorisation of EMSIFs using the developed (FACES) model

v) **Independent categorisation sessions** – These were held to enable independent researchers use the newly constructed model to categorise EMSIFs. By inviting independent researchers to conduct identical categorisations of EMSIFs, sessions addressed the issue of subjectivity raised by the model being used by a sole researcher. The categorisation sessions were held in two phases as follows:

a. During the first phase, independent researchers (n=14) from the University of Salford were gathered in a formal session. Basic principles about EMSIFs were explained, and instructions for using given models to categorise EMSIFs were provided. This orientation session was kept deliberately brief to ensure independent thought and that researchers' categorisations were not overly influenced. Appendix 4A of this thesis contains the slides presented to researchers. Researchers were presented with information sheets explaining respective categories of EMSIF models allocated to them (1 – 4 EMSIF models were randomly allocated to each researcher, depending on their speed of completing categorisations), and packets each containing a complete set of 171 EMSIFs to be fitted into each model. During the session, researchers were generally left to work alone. Questions were handled by briefly explaining the elements of each model, taking care not to influence researchers' opinions of which category each EMSIF should fit into. Direct questions asking opinions of which model categories were considered appropriate for specific EMSIFs were not answered. Sessions were recorded on video camera and through photographs.

b. During the second phase, independent researchers (n=8) were approached separately and provided with electronic versions of an EMSIF model toolkit specifically developed to speed up the process of categorisation. The electronic

toolkit was developed to make the selection of categories for each EMSIF quicker by providing the researcher with pre-grouped options in an excel spreadsheet.

## 4.5 Findings and results

Four prominent divides exist in the discussion and categorisation of EMSIFs in previous literature. Previous studies have identified EMSIFs all categorised within aspects that are a representation of these four EMSIF divides – the Neoclassical Efficient Choice Divide; the Social Institutional Divide; the Internal Divide, and; the External Divide. These EMSIF categorisation divides are used to construct a new model.

### 4.5.1 The neoclassical efficient choice - social institutional divide

EMSIFs can be broadly grouped into two categories representing a major divide in EMSIF categorisation – the neoclassical efficient choice - social institutional divide. The first category comprises traditionally accepted motivations for pro-environmental behaviour within a neoclassical organisational model, these being market incentives and regulatory influences. In a neoclassical model, an organisation is motivated by its profit-demanding owners, and responds only to economic influences arising from the market in which it operates, and the regulatory pressures seeking to control it. This category includes efficient choice motives related to decisions made by organisations as a result of organisational efficiency, leading to improvement in performance, productivity and profitability. In the neoclassical efficient choice category, organisations are seen as making rational innovation decisions based on their efficiency and profit-making potential. EMSIFs in this category are often internally generated. However, efficient choice factors affecting organisations may also arise externally, whereby organisations react to externally generated motives that lead to organisational efficiency (DiMaggio & Powell, 1983; Neumayer & Perkins, 2005; Powell & DiMaggio, 1991; Tomer, 1992).

A second category is the new institutional-in-sociology approach which has little to do with enhancing economic or technical performance since it focuses on a new social dimension. Within this dimension, the organisation is affected by social and institutional influences including macro and micro social pressures, internal organisational capabilities, environmental

opportunities and supplementary regulatory pressures. Organisations make decisions to implement environmental initiatives as a result of social pressures, and in a bid to gain legitimacy. These social pressures are usually exerted externally to persuade an organisation to adopt desirable behaviour.

However, social institutional sources may also arise internally, for instance when an organisation's employees prefer or demand environmentally responsible behaviour. The social institutional divide, while acknowledging the existence of additional macro and micro influences affecting an organisation's behaviour, modulates the importance of market and regulatory influences. These two motivational categories (neoclassical efficient choice and social institutional) simultaneously act on organisations to bring about pro-environmental behaviour such as EMS implementation (Guller, Guillen & Macpherson, 2002; Kogut & Parkinson, 1998; Neumayer & Perkins, 2005; Powell & DiMaggio, 1991; Rosenkopf & Abrahamson, 1999; Tomer, 1992).

A definition of the neoclassical efficient choice category is that it comprises *motives based on organisational performance, profitability and efficiency, in which the organisation responds primarily to market and regulatory incentives*. A definition of the social institutional category is that is comprises *motives related to social and institutional pressures which persuade an organisation to adopt certain practices*. A diagrammatic representation of the neoclassical efficient choice-social institutional divide was constructed and is shown in Figure 4.1.

### 4.5.2 The internal - external divide

EMSIFs are also grouped into broad geographical categories referred to as 'internal' and 'external' (Heras et al., 2011; Heras & Arana, 2010; Neumayer & Perkins, 2005; Powell & DiMaggio, 1991). Neumayer and Perkins (2005) describe internal EMSIFs as stemming from within an organisation and external EMSIFs as influences operating outside the organisation. Heras et al (2011) and Heras and Arana (2010) from an analysis of theoretical, practitioner and academic literature on EMS drivers, concluded that drivers could be grouped into two categories – internal EMS drivers, which are motivations related to environmental improvement, sustainable development, corporate decision making, previous experience in the

quality control and other internal generated motives, and – external EMS drivers which are related to customer demand, external image, compliance with regulation, public administration demands and other external factors. EMS benefits have also been broadly grouped into internal benefits and external benefits as reported by Gavronski et al (2008), Matuszak-Flejsman (2008) and Zorpas (2010). EMS barriers can similarly be categorised into internal and external barriers or costs. Internal EMS barriers include costs of EMS implementation that stem from within the organisations itself, and external EMS barriers arising from sources external to the organisation (Boiral, 2011; Rao, 2006).

**Neoclassical Efficient Choice**

Motives based on organisational performance, profitability and efficiency, in which the organisation responds primarily to market and regulatory incentives.

---

**Efficient Choice FactorsSocial Institutional**

Motives related to social and institutional pressures which persuade an organisation to adopt certain practices.

*Figure 4.1 - Neoclassical efficient choice-social institutional divide (adapted from Tomer, 1992 and Neumayer and Perkins, 2005)*

The internal-external divide provides a consistent plane along which EMSIFs may be classified, as: i) it has been adopted or referred to by multiple research studies, and ii) functionally, it presents a guide for classifying EMSIFs by placing an emphasis on the organisation in terms of its physical setting and in relation to influences in and around it. The internal EMSIF category can be defined as *motives stemming from within an organisation leading it to implement environmental initiatives*. The external EMSIF category can be defined as *motives stemming from influences operating outside an organisation*. A diagrammatic representation of this divide is shown in Figure 4.2.

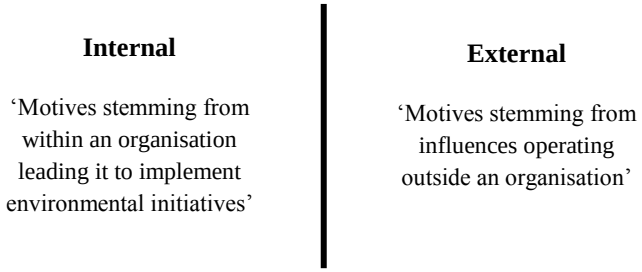



*Figure 4.2 - The internal-external categorisation divide (adapted from Heras et al., 2011)*

### 4.5.3 Development of the factors affecting corporate environmental systems (FACES) model

***A cross-alignment of Neoclassical Efficient Choice-Social Institutional and Internal-External divides produces a new, more functional and widely applicable EMSIF categorisation model***

EMS studies show different proclivities towards efficient choice and new social institutional approaches in categorising EMSIFs, with some stating that organisations adopt environmental initiatives based on economic considerations and others leaning towards a more institutional approach, where organisations' behaviour is primarily affected by social forces in and around an organisation. It is more feasible that organisations are impacted by a combination of the two rather than a single approach and that, though organisations' pro-environmental behaviour will always be influenced by social pressures, pro-environmental decisions will also be made in consideration of organisational efficiency and profitability. This leads to the premise that organisational EMSIFs are affected by both efficient choice and new social institutional divides, and a model categorising them should contain these two divides.

EMSIFs are similarly affected by internal and external categories, as they either stem from outside of or within an organisation. Together, these two divides represent the totality of influences affecting organisations pro-environmental behaviour, irrespective of their geographical location, economic standing or industry sector. A cross alignment and combination of internal-external and neoclassical efficient choice-social institutional divides leads to a new model useful in classifying EMSIFs across a range of industries and

geographical locations. The FACES (Factors Affecting Corporate Environmental Systems) categorisation model has been constructed to comprise four elements (quadrants) representing the four categories and two divides in EMSIF categorisation. The FACES model is shown in Figure 4.3.

The FACES model also inherently comprises 'positive' and 'negative' divides since EMSIFs may positively influence pro-environmental behaviour as drivers and benefits or negatively impact behaviour as barriers. This adds a third dimension or axis to the model, where each quadrant contains positive and negative segments. Pro-environmental behaviour drivers and benefits can be viewed interchangeably, since a factor that drives pro-environmental behaviour may also evolve into a benefit to the same organisation

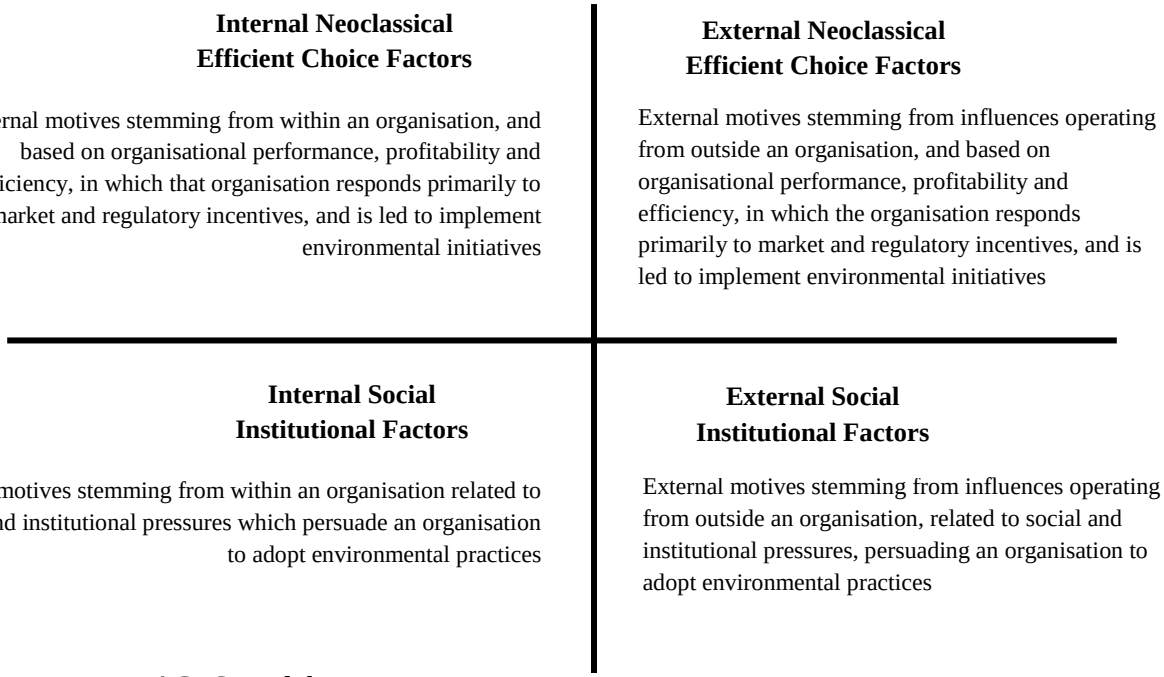



*Figure 4.3 – New FACES model*

As such, the positive portion of the axes in the FACES model arises from EMSIFs which are either drivers or benefits of pro-environmental behaviour, thereby exhibiting a 'positive' environmental influence on organisations. Barriers, on the other hand act as a deterrent to pro-environmental behaviour. Therefore, the negative portion arises from EMSIFs which are

barriers to pro-environmental behaviour, exhibiting a ‘negative’ influence on organisations. 'Figure 4.4 shows positive and negative parts of the FACES model.

In analyzing factors affecting pro-environmental behaviour, a result showing a greater proportion of EMSIFs falling within the positive area of a quadrant indicates the importance of certain drivers and benefits in pro-environmental behaviour or implementation of EMSs. A greater proportion of EMSIFs falling within a negative part of a quadrant indicates the importance of certain barriers in EMS implementation. An understanding of the relevance of the positive and negative axes of the four quadrants of the FACES model is fundamental in understanding pro-environmental behaviours such as EMS implementation, and in the making of recommendations as to how organisations can improve and increase implementation of structured EMSs.

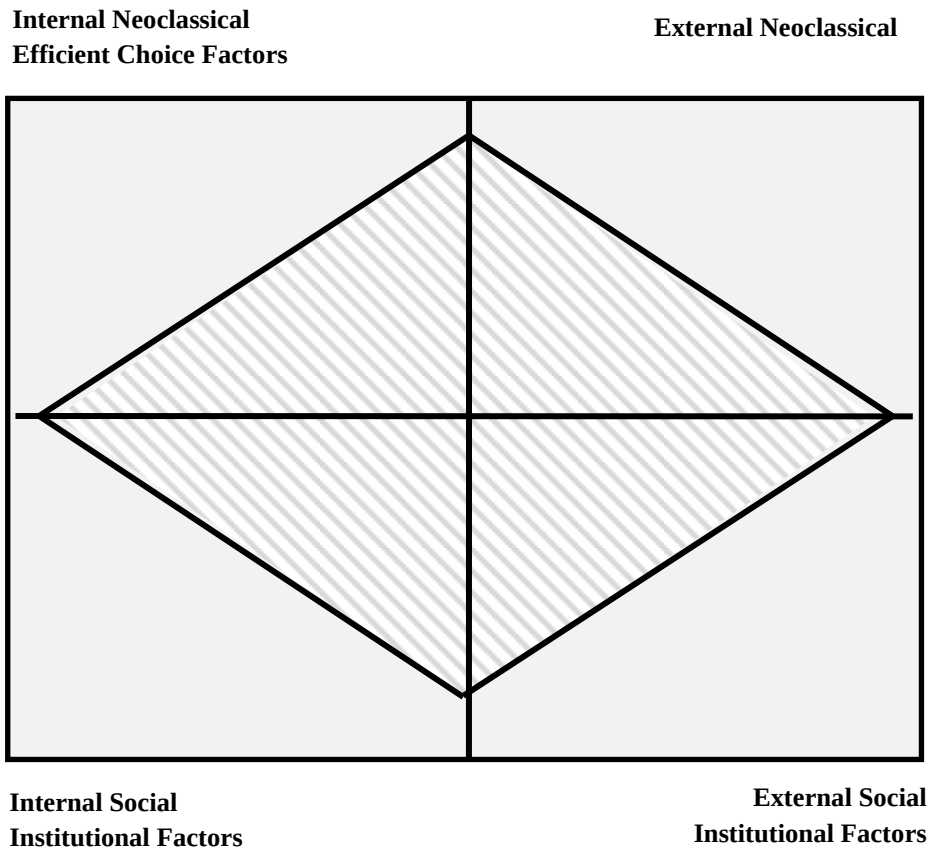



*Figure 4.4 - The FACES model showing positive and negative parts*

### 4.5.4 Validation of the FACES model

In order to determine the relevance of the FACES model in analyzing and categorising EMSIFs, validation was done in three ways:

1. Using the FACES model to classify EMSIFs reported from 22 previous EMS studies
2. Categorising EMSIFs reported from previous EMS studies using 20 other categorisation models, and comparing results with FACES model categorisation results
3. External validation of the FACES model through similar categorisations conducted by independent researchers
4. Using the FACES model to analyse/determine the existence of geographical and economic influences on pro-environmental behaviour in organisations

### 4.5.5 Results from classification of EMSIFs from 22 studies using the FACES model

The FACES model was used to categorise the results (171 reported EMSIFs) of 22 previous EMS studies. Selected studies covered a range of geographic locations. All geographical world regions were represented in the selection of studies as shown in Table 4.5 (world region classifications used were obtained from the ISO Survey, 2010).

*Table 4.5 – EMS studies' world regions*

| **World Region** | **Abbreviation** | **Number of studies** |
|---|---|---|
| North America | NAm | 4 |
| Europe | Eur | 5 |
| Far East | Far E | 3 |
| Africa and West Asia | Af & WAsia | 5 |
| Central and South America | C & SAm | 2 |
| Australia and New Zealand | Aus & NZ | 2 |
| **Total number of studies** | | **22** |

Of the 171 EMSIFs reported, 27% were driver-type EMSIFs and 35% were benefit-type EMSIFs. This is shown in Figure 4.5. 38% of EMSIFs reported were EMS barriers, indicating that organisations are potentially more affected by barriers to the adoption of pro-environmental behaviour than by drivers or benefits. However, using identified barriers as an indication of a greater effect can be misleading, as simple counts can be subjective. Though more barriers have been identified in these studies, these may be less potent than identified drivers and benefits, bringing about a cumulatively weaker influence on organisations.

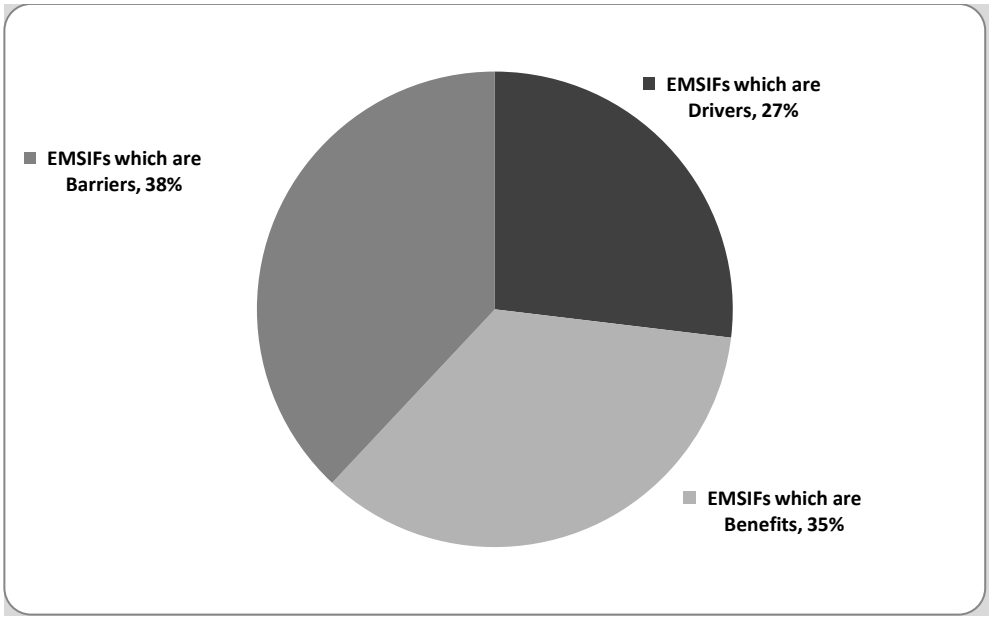



*Figure 4.5 – EMSIF types reported in 22 previous EMS studies*

All EMSIFs reported in previous studies were found to be relevant to a FACES category, with each EMSIF able to fit into a model category. Table 4.6 summarizes how EMSIF types (drivers, benefits and barriers) were categorised across FACES categories. The most benefits reported (45%) were internal neoclassical efficient choice EMSIFs, while most barriers (60%) were also internal neoclassical efficient choice EMSIFs. This indicates that pro-environmental behaviour is strongly affected by 'internal motives stemming from within based on organisational performance, profitability and efficiency'.

Out of 46 EMS drivers reported, there was a near even spread of EMS drivers amongst all categories in the FACES model, meaning that EMS drivers equally stem from all categories of EMSIFs. The highest proportion of drivers (32%) was in the internal social institutional category. Results also indicate that the lowest proportion of barriers affecting pro-environmental behaviour were external neoclassical efficient choice factors (6%) such as 'legal liability and transaction costs' and 'lack of client support and customer demand'.

Furthermore, a total of 76 out of 171 EMSIFs reported fell into the internal neoclassical efficient choice category and 26 fell into the external neoclassical efficient choice category. Of the remainder, 31 EMSIFs fell into the internal social institutional category and 38 fell into the external social institutional category. This reveals that internal neoclassical efficient choice EMSIFs, such as profitability and efficiency or lack of management commitment, are most commonly reported as influencing organisations' pro-environmental behaviour. Conversely, external neoclassical efficient choice factors like insurance costs and customer demand were least reported in previous EMS studies.

*Table 4.6 – Distribution of different EMSIF types across FACES model categories*

| **EMSIF Type** | **Internal Social Institutional** | **External Social Institutional** | **Internal Neoclassical Efficient Choice** | **External Neoclassical Efficient Choice** |
|---|---|---|---|---|
| Drivers | 32% (n= 15) | 22% (n= 10) | 22% (n= 10) | 24% (n= 11) |
| Benefits | 14% (n= 8) | 23% (n= 14) | 45% (n=27) | 18% (n= 11) |
| Barriers | 12% (n= 8) | 22% (n= 14) | 60% (n= 39) | 6% (n= 4) |
| Total Number | 31 | 38 | 76 | 26 |

A breakdown of details of previous EMS studies and how study results were fitted into FACES categories is shown in Tables 4.7, 4.8 and 4.9.

*Table 4.7 – Classification of EMS drivers from previous studies using the FACES Model*

| RESEARCH STUDY (EMS DRIVERS) | INTERNAL EFFICIENT CHOICE FACTORS | EXTERNAL EFFICIENT CHOICE FACTORS | INTERNAL SOCIAL INSTITUTIONAL FACTORS | EXTERNAL SOCIAL INSTITUTIONAL FACTORS |
|---|---|---|---|---|
| 1. **Delmas, 2002** This research presents the top incentives for ISO 14001 certification as discovered from surveyed organisations/NAm[7][8] | • Reduced environmental risk<br>• Improved internal communication amongst managers<br>• Marketing/advertising opportunity | • Increased competitive advantage<br>• Increased international trade opportunities<br>• Access to new markets<br>• Greater market share | • Improved management of environmental impacts<br>• Reduced pollution<br>• Public demonstration of environmental stewardship | • Improved compliance with government regulation<br>• Improved regulatory compliance |
| **2. Matuszak-Flejsman, 2007** This research gives reasons for organisations' implementation of EMSs compliant with ISO 14001/Eur[9] | • Development guidelines for quality management system already in use | • Possible growth in exports of company products<br>• Company plan to increase market share | • Care for the environment<br>• Company development strategy<br>• Reducing environmental impact<br>• Raising pro-ecological awareness of employees | • Compliance with legal requirements<br>• Interest of local community in company activities<br>• Influence of third parties on company activities |
| 3. **Sambasivan & Fei, 2007** This research reports the primary reasons (drivers) why companies pursue ISO 14001 registration/FarE[10] | • Improving company operations<br>• Providing a clean environment through clean operations | • Gaining entry into global markets<br>• Gaining/maintaining competitive position in global markets | • Improving company image | • Strong public pressure in developed and developing economies |
| **4. Kehbila, 2009** This research reports results on the most frequently named drivers for introducing EMSs within the South African automotive industry/Af&WAsia[11] | | | • Lowering day-to-day impacts on the environment<br>• Improving working and living conditions of employees | • Improving/achieving consistent compliance |
| **5. Heras et al., 2011** This research names EMS drivers in two categories; sources of motivation of an internal nature and sources of an external nature/Eur[14] | • Previous experience in the field of quality control | • Motivations related to customer demands | • Desire for environmental improvement and sustainable development<br>• Corporate decision making<br>• External company image | • Compliance with current legislation<br>• Demands made by public administration |
| **6. Massoud et al., 2010a** This research reports drivers for ISO 14001 adoption/C&SAm[12] | • Reducing operational cost<br>• Meeting company requirements<br>• Use of EMS as marketing tool | • Overcoming export barriers<br>• Meeting customer demand | • Improving environmental performance<br>• Enhancing company image | • Following international trends |

[7] World region geographical classification obtained from the ISO Survey. Source:1999 - 2010 figures from http://www.iso.org/iso/iso-survey2010.pdf

[8] North America

[9] Europe

[10] Far East

[11] Africa and West Asia

[12] Central and South America

*Table 4.8 – Classification of EMS benefits from previous studies using the FACES Model*

| RESEARCH STUDY (EMS BENEFITS) | INTERNAL EFFICIENT CHOICE FACTORS | EXTERNAL EFFICIENT CHOICE FACTORS | INTERNAL SOCIAL INSTITUTIONAL FACTORS | EXTERNAL SOCIAL INSTITUTIONAL FACTORS |
|---|---|---|---|---|
| **7. Shen & Tam, 2002**<br>This study reports important benefits of EMSs in the construction sector | • Minimization of environmental risk<br>• Cost savings due to compliance with environmental guidelines | | • Contribution to environmental protection | • Development of a positive environmental image |
| **8. Bansal & Hunter, 2003**<br>This study reports EMS benefits in a comparison of a sample of 46 US firms with and without ISO 14001/NAm | • Fewer environmental crises | | | • Higher levels of environmental legitimacy<br>• Wider international scope relative to non-certified peers |
| **9. Bellesi et al 2005**<br>The survey results corroborate the view that ISO 14001 accreditation confers economic benefits/Af&WAsia | • Organisational efficiency<br>• Better waste management | • Marketing advantages<br>• Competitiveness by reducing risk and exposure to costly litigation<br>• Possibility of selling to customers requiring ISO 14001 certification | | • Standard of worldwide recognition |
| **10. Hughey et al., 2005**<br>This study examines EMS performance factors in the wine industry in New Zealand/Aus&NZ[13] | • Decreased waste<br>• Decreased use of natural resources<br>• Continual improvement of business systems | | • Increase in staff knowledge concerning the environment<br>• Peer support and information sharing | • Neighbors more content due to changes in organisation |
| **11. Curkovic et al., 2005**<br>This study examines factors which influence the decision to adopt ISO 14001/NAm | • Improved environmental performance<br>• Improved internal management methods<br>• Reduced overhead costs<br>• Probable reduction in regulatory non-compliance and fines | Avoidance of potential non-tariff trade barriers<br>• Competitive advantage in certain markets<br>• Improved access to capital and reduced capital costs<br>• Reduction in insurance costs | • Improved company image | • Improved stakeholder satisfaction<br>• Fewer EPA inspections |
| **12. Tan, 2005**<br>This study analyses the potential benefits of EMS implementation in Malaysia /FarE | • Better business control and operations efficiency<br>• Cost reduction<br>• Less injuries/environmental accidents<br>• More research and development<br>• Improved work culture | • Marketing advantages | | • Transparency/openness<br>• Improved company's image |

[13] Australia and New Zealand

*Table 4.8 (cont.) – Classification of EMS benefits using the FACES Model*

| RESEARCH STUDY (EMS BENEFITS) | INTERNAL EFFICIENT CHOICE FACTORS | EXTERNAL EFFICIENT CHOICE FACTORS | INTERNAL SOCIAL INSTITUTIONAL FACTORS | EXTERNAL SOCIAL INSTITUTIONAL FACTORS |
|---|---|---|---|---|
| **13. Alemagi et al., 2006**<br>This study reports on EMS implementation factors in Cameroon/Af&WAsia | • Economic benefits | | • Environmental benefits | |
| **Kehbila et al., 2009**<br>This research reports results on three most frequent drivers for introducing EMSs within the South African automotive industry/Af&WAsia | • Improved reliability of legal standards | • Improved competitiveness | | • Improved customer relations<br>• Improved stakeholder relations |
| **14. Heras & Arana, 2010**<br>This study reports EMS benefits SMEs with ISO 14001/Eur | • Environmental efficiency improvement (e.g. reduction in consumption levels and residues)<br>• Minimization of internal company problems (e.g. leaks and dumping)<br>• Improvement in internal efficiency (e.g. participation and awareness-raising of employees) | | | • Improvement in the external image of the company<br>• Improvement in compliance with laws and regulations |
| **15. Zorpas, 2010**<br>This study reports on EMS factors in SME's[14] and VSME's[15] in Cyprus/Eur | • Facilitating greater awareness of legislative requirements<br>• Identifying potential for cost savings through efficiency improvement<br>• Providing better understanding and greater control of emission reducing and pollution processes<br>• Implementing best environmental-friendly technologies Resource savings and lower cost<br>• Saving due to reactive management strategies such as remediation, clean-ups and paying penalties for breach of legislation | • New business opportunities in markets where green production processes are important<br>• Marketplace advantage | • Improving a company's public image by enabling more detailed reporting<br>• Improved quality of workplaces, employee morale and incentive to team building<br>• Improved company image by improving stakeholder relations | • Added credibility and confidence with public authorities, other businesses and customers |

[14] SME – Small Medium Enterprise

[15] VSME – Very Small Medium Enterprise

*Table 4.9 – Classification of EMS barriers using the FACES Model*

| RESEARCH STUDY (EMS BARRIERS) | INTERNAL EFFICIENT CHOICE FACTORS | EXTERNAL EFFICIENT CHOICE FACTORS | INTERNAL SOCIAL INSTITUTIONAL FACTORS | EXTERNAL SOCIAL INSTITUTIONAL FACTORS |
|---|---|---|---|---|
| **16. Ofori et al. 2002** This study identifies the major problems for construction firms in Singapore in the application of the ISO 14000 EMS/FarE | • Lack of personnel<br>• Failure of ISO 14000 EMS benefits to balance organisation's costs<br>• High costs in application<br>• Discrepancies due to the change of traditional applications | | | • Lack of information within the construction sector<br>• Lack of client support |
| **Delmas, 2002** This study identifies a number of barriers that prevent organisations from considering ISO 14001 implementation/NAm | • ISO 14001 audit results which reveal weaknesses handling of environmental matters and may be used in legal proceedings against organisation<br>• Search and information costs | • Legal liability and transaction costs from information disclosure during the ISO 14001 certification process | | • Potential discovery of previously unidentified/unresolved regulatory violations |
| **Shen & Tam 2002** This study identifies a number of obstacles in the application of EMS | • Increasing managerial costs<br>• Time-consuming nature of environmental performance development. | • Lack of client support | | • Lack of experts/qualified staff<br>• Lack of subcontractor cooperation |
| 17. **Zutshi & Sohal 2004** This study reveals key barriers to successful ISO 14001 implementation in surveyed organisations/Aus&NZ | • Implementation costs<br>• Certification costs<br>• Other internal costs (training, auditors fees, auditing) | | • Extent of involvement of employees, suppliers and other stakeholders<br>• Interpretation of terms present within the standard | • Lack of support and resources<br>• Unclear guidelines for EMS implementation |
| **Alemagi et al., 2006** This study reports on EMS implementation factors in Cameroon/Af&WAsia | • Financial constraints<br>• Lack of capable human resources<br>• Time constraints | | | |
| 18. **Turk, 2009** This study focuses on the greatest disadvantages of obtaining ISO 14000 for the firms/Eur | • High implementation costs<br>• Long certification process<br>• Increased paperwork<br>• Lack of qualified personnel | | • Company management not open to research and criticism | • Lack of sufficient information regarding ISO 14001 certificates |
| **19. Heras & Arana, 2010** This study reports findings on problems with internal organisational adaption when implementing EMSs/Eur | • Difficulty in internally incorporating new EMS system to routine activities<br>• Internal adaption managing documentation problems | | • Lack of awareness raising | • Being up to date and complying with legal requirements |

*Table 4.9 (cont.) – Classification of EMS barriers using the FACES Model*

| RESEARCH STUDY (EMS BARRIERS) | INTERNAL EFFICIENT CHOICE FACTORS | EXTERNAL EFFICIENT CHOICE FACTORS | INTERNAL SOCIAL INSTITUTIONAL FACTORS | EXTERNAL SOCIAL INSTITUTIONAL FACTORS |
|---|---|---|---|---|
| 20. **Oliveira et al., 2010** This study compares EMS and costs based on ISO 9001 QMS/C&SAm | • Structural adjustments<br>• Budget barriers<br>• New equipment investments<br>• Physical adaptation of installations<br>• Excess/duplicity of reports<br>• Systematic monitoring of air, water and environmental control<br>• Training/contracting personnel costs<br>• Awareness program costs<br>• Contracting of external auditors, specialists | | | • Bureaucratic and lengthy environmental regulatory agency processes |
| **21. Massoud et al., 2010b** This study reveals the main challenges facing Lebanese manufacturing organisations in improving their environmental performance/Af&WAsia | • Certification costs<br>• Time demand/costs<br>• Paucity of economic resources | • Lack of customer demand<br>• ISO 14001 not a requirement for export market entry | • Lack of top management commitment<br>• Low priority accorded to environmental issues as a result of severe social, political, and economic problems in developing countries<br>• Lack of in-house knowledge<br>• ISO 14001 benefits not clear to organisations | • Lack of government cooperation/support<br>• Outdated in-country legislation<br>• Lack of technical expertise/experienced local consultants<br>• Lack of compliance policies for implementing relevant laws and regulations |
| 22. **Curkovic & Sroufe, 2011** This study focuses on the main criticisms of ISO 14001/NAm | • Man hour demands<br>• Manpower and internal auditing costs<br>• Non-value adding costs<br>• ISO 14001 registered companies still producing large amounts of waste<br>• Registration fees/costs<br>• Intensive paperwork<br>• Limited focus of ISO 14001 on continuous improvement | | | |

### 4.5.6 Comparison of categorisations using FACES model and other EMSIF models

EMSIFs from previous EMS studies (n=22) were categorised using other EMSIF categorisation models (models are listed in Tables 4.2 – 4.4 above). The results of these categorisations can be found in Appendix 4B of this thesis. Whereas all reported EMSIFs were able to fit into a FACES category, EMSIFs did not completely fit into other model categories. For each model, EMSIFs which did not fit into a model category were placed in an 'unable to fit' category. EMSIFs did not completely fit into other EMSIF models for the following reasons:

1. Some EMSIF models were restricted to categorising specific EMSIF-types e.g. EMS drivers only, and could therefore not be used to classify other types. EMSIF categorisation models for categorising barrier-type EMSIFs only such as Lin et al (2006), Bansal and Howard (1997) and Boiral (2011) could not categorise EMS drivers or benefits, resulting in a large number of EMSIFs (110, 110 and 113 EMSIFs respectively) in the 'unable to fit into a category' column.
2. Some EMSIF models did not have robust enough categories to categorise all EMSIFs. For instance, the model presented by Tomer (1992) does not address organisational financial costs or liabilities, the model presented by Bansal and Roth (2000) does not address regulatory issues, the model presented by Jiang and Bansal does not address social issues such as environmental concern or pressures from social entities, and the model presented by Edwards (2004) does not address internal organisational issues.
3. Some EMSIF models were limited by both (1) and (2) above i.e. they were limited to categorising specific EMSIF-types and also had restrictions in the scope of their coverage. For instance, the model presented by Rao et al (2006) categorises only barrier-type EMSIFs and is also restricted in that it does not address internal or external social issues such as social influences from individuals or institutions.
4. Furthermore, several EMSIF models did not specifically address the grouping of EMSIFs from a geographic perspective i.e. internal and external influencing factors, making them unable to group some EMSIFs.

Table 4.10 shows a summary of categorisation results from the FACES model and other models.

*Table 4.10 – Results of EMSIF categorisations using the FACES and other models – primary researcher*

| EMSIF CATEGORISATION MODEL SOURCE | MODEL CATEGORY 1 | MODEL CATEGORY 2 | MODEL CATEGORY 3 | MODEL CATEGORY 4 | MODEL CATEGORY 5 | UNABLE TO FIT INTO A CATEGORY |
|---|---|---|---|---|---|---|
| **FACES Model** | **76 (Int. Efficient Choice Factors)** | **26 (Ext. Efficient Choice Factors)** | **31 (Int. Soc. Institutional Factors)** | **38 (Ext. Soc. Institutional Factors)** | - | **0** |
| Matzsuzak & Flejsman, 2008b | 44 (Economic Impacts) | 19 (Operational Env. Impacts) | 55 (Mgt of Env Impacts) | 24 (External Benefits) | - | 29 |
| Tomer, 1992 | 25 (Market Incentives) | 26 (Social Influences) | 11 (Regulatory Influences) | 45 (Internal Org Capabilities) | 24 (Env. Opportunities) | 40 |
| Neumayer & Perkins, 2005 | 89 (Internal or Efficiency Motives) | 22 (External or Institutional Motives) | - | - | - | 60 |
| Heras et al., 2010 | 65 (Internal Motivations) | 45 (External Motivations) | - | - | - | 61 |
| Heras & Arana, 2010 | 65 (Internal Drivers) | 45 (External Drivers) | - | - | - | 61 |
| Curkovic & Sroufe, 2011 | 29 (Resource & Cost Efficiency) | 30 (Competition & Reputation) | 38 (Proactive Env. Mgt.) | 11 (Involvement & Communication) | - | 63 |
| Zutshi & Sohal, 2004 (Benefit Categorisation) | 55 (Tangible Benefits) | 50 (Intangible Benefits) | - | - | - | 66 |
| Matzsuzak & Flejsman, 2008 | 49 (Economically Quantifiable Benefits) | 56 (Economically Non-quantifiable Benefits) | - | - | - | 66 |
| Jiang & Bansal, 2003 | 23 (Market Demands) | 67 (Management Control) | 11 (Institutional Pressures) | - | - | 70 |
| Gavronski et al., 2008 | 41 (Internal Benefits) | 54 (External Benefits) | - | - | - | 76 |
| Tan, 2003 | 24 (Competitive Advantage) | 39 (Eff Op. & Imp in Co. Image) | 29 (Env. Benefits) | - | - | 79 |
| Zorpas, 2010 | 28 (Commercial Benefits) | 19 (Internal Benefits) | 29 (Env. Benefits) | 7 (Communication Benefits) | - | 88 |
| Bansal & Roth, 2000 | 30 (Competitive Motives) | 20 (Relational Motives) | 26 (Ethical Motives) | - | - | 95 |
| Hertin et al., 2008 | 16 (Regulatory Certainty) | 19 (Int./Ext. Communication) | 36 (Env. Performance) | - | - | 99 |
| Darnall et al., 2008 | 24 (Market Pressures) | 29 (Social Pressures) | 18 (Regulatory Pressures) | - | - | 100 |
| Edwards, 2004 | 21 (Commercial Drivers) | 24 (Ethical Drivers) | 13 (Legal Drivers) | 11 (Economic Drivers) | - | 102 |
| Zutshi & Sohal, 2004 (Barrier Categorisation) | 9 (Industrial Barriers) | 53 (Organisational Barriers) | - | - | - | 109 |
| Bansal & Howard, 1997 | 21 (Market Drivers) | 19 (Social Drivers) | 11 (Regulatory Drivers) | 10 (Financial Drivers) | - | 110 |
| Lin et al., 1997 | 14 (Tech. Barriers) | 28 (Mgt. Barriers) | 19 (Support Barriers) | - | - | 110 |
| Boiral, 2011 | 36 (Insufficient Resources) | 8 (Inappropriate/Excessive Documentation) | 0 (Externalization of Implementation Process) | 1 (Lack of Followup/System Continuity) | 13 (Search for External Certification) | 113 |
| Powell & DiMaggio, 1991 | 5 (Coercive Pressures) | 25 (Mimetic Pressures) | 11 (Regulatory Pressures) | - | - | 131 |

### 4.5.7 EMSIF categorisations carried out by independent researchers

Independent researchers from the University of Salford were asked to conduct categorisations of EMSIFs from previous EMS studies, also using the FACES model and other EMSIF categorisation models. Selected researchers were postgraduate environmental management students studying for either a Masters or Doctor of Philosophy degree. A total of 74 categorisations were carried out by 14 independent researchers. Results were compared with categorisations done by the primary researcher. Table 4.11 shows summary results of how independent researcher categorisation of EMSIFs compared with primary researcher categorisations.

Results from independent researchers' categorisation of EMSIFs using other models were mixed. 8 out of 11 independent researchers successfully used the FACES model to categorise over 70% of 171 given EMSIFs from previous studies. In 38 out of 63 categorisations involving other models, over 70% of 171 EMSIFs were categorised. Researchers' ability to use the categorisation models was dependent on a number of factors ranging from the actual functionality of each model, the ease of understanding EMSIF terminology and researchers level of familiarity with EMSs and EMS categorisation in general.

### 4.5.8 Analysis of geographical influences on reported EMSIFs using FACES model

FACES model categorisation results for EMSIFs from the 22 previous studies were analysed according to geographical and economic factors, by grouping each of the 22 studies according to geographic and economic regions. This was done to assess the usefulness of the model in determining the existence of geographic and economic influences on EMSIFs.

Absolute numbers of EMSIFs reported in each geographical region were grouped using FACES model categories. Table 4.12 and Figure 4.6 show EMSIF grouping according to geographical region. Results show that studies based on organisations in the North American region reported the highest number of internal and external efficient choice EMSIFs (such as cost savings, organisational efficiency, better business control and operations efficiency, market advantages, competitive advantages and lack of client support or customer demand).

*Table 4.11 – Summary of EMSIF categorisations done by primary and independent researchers*

| **EMSIF MODEL SOURCE** | **EMSIFs Unable to fit into model** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **R1** | **R2** | **R3** | **R4** | **R5** | **R6** | **R7** | **R8** | **R9** | **R10** | **R11** | **R12** |
| FACES Model | 0 | 37 | 62 | 0 | 33 | 65 | 6 | 4 | 49 | 1 | 3 | 45 |
| Jiang & Bansal, 2003 | 38 | 69 | 47 | 3 | | | | | | | | |
| Tomer, 1992 | 52 | 65 | 0 | 5 | | | | | | | | |
| Curkovic & Sroufe, 2011 | 58 | 71 | 3 | | | | | | | | | |
| Zutshi & Sohal, 2004 (Benefits) | 62 | 72 | 63 | 78 | | | | | | | | |
| Matzsuzak & Flejsman, 2008 | 64 | 67 | 73 | | | | | | | | | |
| Gavronski et al., 2008 | 64 | 89 | 77 | 70 | | | | | | | | |
| Neumayer & Perkins, 2005 | 65 | 62 | 52 | 0 | | | | | | | | |
| Heras et al., 2010 | 65 | 13 | 39 | 97 | | | | | | | | |
| Heras & Arana, 2010 | 65 | 62 | 68 | 96 | 0 | | | | | | | |
| Matzsuzak & Flejsman, 2008b | 79 | 81 | 11 | 104 | | | | | | | | |
| Tan, 2003 | 83 | 49 | 114 | 105 | | | | | | | | |
| Zorpas, 2010 | 88 | 62 | 2 | 77 | | | | | | | | |
| Zutshi & Sohal, 2004 (Barriers) | 94 | 112 | 0 | 2 | 109 | | | | | | | |
| Bansal & Howard, 1997 | 99 | 55 | 62 | 73 | 9 | | | | | | | |
| Bansal & Roth, 2000 | 104 | 20 | 3 | 42 | | | | | | | | |
| Lin et al., 1997 | 105 | 52 | 93 | | | | | | | | | |
| Edwards, 2004 | 111 | 77 | 2 | 43 | | | | | | | | |
| Darnall et al., 2008 | 112 | 55 | 91 | 0 | 73 | | | | | | | |
| Hertin et al., 2008 | 125 | 37 | 117 | 39 | | | | | | | | |
| Boiral, 2011 | 126 | 113 | 25 | | | | | | | | | |
| Powell & DiMaggio, 1991 | 128 | 41 | 66 | 93 | | | | | | | | |
| ***R1 – Primary researcher*** | | | | | | | | | | | | |

Studies on organisations in Europe reported the highest number of internal and external social institutional EMSIFs (such as environmental benefits, improved company image, higher levels of environmental legitimacy, increase in staff knowledge concerning the environment, improved management of environmental impacts, improved compliance with government regulation and public demonstration of environmental stewardship).

*Table 4.12 – Breakdown of EMSIFs by geographical region using FACES Model*

| **World Region** | **Internal Neoclassical Efficient Choice EMSIFs** | **External Neoclassical Efficient Choice EMSIFs** | **Internal Social Institutional EMSIFs** | **External Social Institutional EMSIFs** |
|---|---|---|---|---|
| North America | **17** | **9** | 4 | 7 |
| Europe | 16 | 5 | **12** | **10** |
| Far East | 15 | 4 | 2 | 8 |
| Africa and West Asia | 10 | 6 | 7 | 8 |
| Central and South America | 12 | 2 | 2 | 2 |
| Australia and New Zealand | 6 | 0 | 4 | 3 |

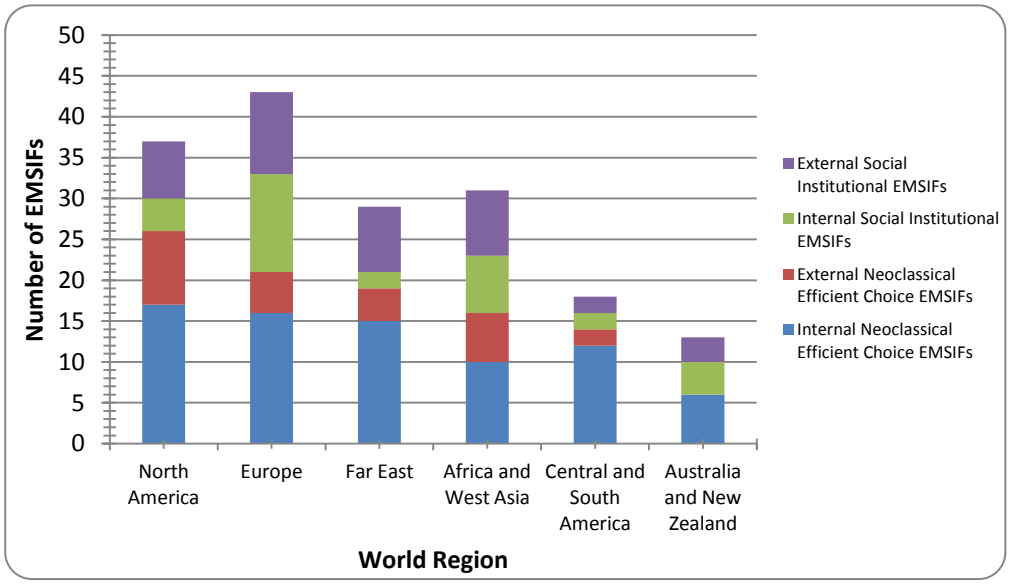



*Figure 4.6 Breakdown of EMSIFs by geographical region using FACES Model*

However, as the values in Table 4.9 and Figure 4.6 represent absolute values, results are affected by the frequency of studies carried out in each region, causing possible distortion

in results analysis. To address this, EMSIF metrics for each of the regions were calculated by computing 'EMS study ratios', where:

a. Driver Study Ratio = No. of EMS drivers identified/No. of studies in region
b. Benefit Study Ratio = No. of EMS benefits identified/No. of studies in region
c. Barrier Study Ratio = No. of EMS barriers identified/No. of studies in region
d. EMSIF Study Ratio = Total no. of EMSIFs identified/Total no. of studies

Analysis using EMS study ratios provides more accurate results, as ratios are computed by calculating the number of studies per region. Study ratios per geo region are shown in Table 4.13.

*Table 4.13 – Analysis of EMSIFs by geographical region showing study ratios*

| **Geo Region** | **No of Studies in Region** | **No of EMS Drivers** | **Driver-Study Ratio** | **No of EMS Benefits** | **Benefit-Study Ratio** | **No of EMS Barriers** | **Barrier-Study Ratio** | **Total No of EMSIFs** | **EMSIF-Study Ratio** |
|---|---|---|---|---|---|---|---|---|---|
| NAm | 4 | 12 | 3 | 14 | 3.5 | 11 | 2.75 | 37 | 9.25 |
| Eur | 5 | 17 | 3.4 | 16 | 3.2 | 10 | 2 | 43 | 8.6 |
| Far E | 3 | 6 | 2 | 12 | 4 | 11 | 3.6 | 29 | 9.6 |
| Af & WAsia | 5 | 3 | 0.6 | 12 | 2.4 | 16 | 3.2 | 31 | 6.2 |
| C & SAm | 2 | 8 | 4 | (None) | (None) | 10 | 5 | 18 | 9 |
| Aus & NZ | 2 | (None) | (None) | 6 | 3 | 7 | 3.5 | 13 | 6.5 |

The Africa and West Asia region had the lowest study ratio (0.6) for EMS drivers identified per study, meaning that the fewest number of drivers per study were identified for studies conducted in that region. Conversely, the Central and South America region had the highest EMS driver study ratio (4.0), meaning that the highest ratio of drivers was identified for that region. From Table 4.10, African and West Asian organisations recorded the lowest EMS benefit study ratio (2.4), indicating that the fewest number of benefits are recorded for studies conducted in this region. Organisations in the Far East had the highest EMS benefit study ratio (4.0) indicating that these organisations derive the most benefits from pro-environmental behaviour. Interestingly, the Europe region had the lowest EMS barrier study ratio (2.0), indicating that organisations in Europe experience the least

number of EMS barriers compared to organisations in other world regions. The Central and South American region had the highest EMS barrier study ratio (5.0), indicating that this world region experiences the greatest relative number of barriers to pro-environmental behaviour.

From the analysis of EMSIFs reported in 22 studies, organisations in Africa and West Asia recorded the lowest ratio of EMS drivers and benefits.

### 4.5.9 Analysis of economic influences on reported EMSIFs using FACES model

Economic influences were analysed using the FACES model by identifying the economic/development status given to each country represented in the 22 studies. Countries were placed in economic categorisations, which were used as a basis for analysis. The economic development classification of each study country at the time of study is shown in Table 4.14 and 4.15. For each EMSIF category, a study ratio was calculated by dividing the number of EMSIFs identified in a study within a particular country by the number of studies conducted in countries within that economic category.

Results show that the 'developing country' category had the lowest study ratio (0.6) for external neoclassical efficient choice EMSIFs, implying that organisations in developing countries are least likely to be influenced by external neoclassical efficient choice EMSIFs such as operational efficiency and marketplace advantage. The 'emerging economy' and 'developed country' categories had the highest study ratio (3.0 and 2.9 respectively) for internal neoclassical efficient choice EMSIFs, indicating that organisations in these economic regions are more affected by internal factors operational efficiency and rational management decisions.

## 4.6 Discussion

Existing literature has reported on a range of EMSIFs related to pro-environmental behaviour (shown in Tables 4.7 – 4.9). However, the existence of a large number of different EMSIF categorisation models has made the comparison and analysis of EMSIFs across geographical and economic regions difficult. The FACES model provides a needed

platform for the categorisation and analysis of EMSIFs. The ability of independent researchers to use the model in the categorisation of EMSIFs demonstrates its usability.

*Table 4.14 – Countries economic development status*

| **Country of study** | **Year(s) of study** | **Economic Classification during study period[#]** |
|---|---|---|
| Australia | 2004 | Developed Country (other advanced economy) |
| Brazil | 2010 | Emerging (newly industrialized) country |
| Cameroon | 2006 | Developing country |
| Cyprus | 2010 | Emerging (advanced) economy – since 2001 |
| Hong Kong | 2002 | Emerging (advanced) economy – since 1997 |
| Israel | 2005 | Emerging (advanced) economy – since 1997 |
| Lebanon | 2010 | Developing country |
| Malaysia | 2005, 2007 | Emerging (newly industrialized) country |
| New Zealand | 2005 | Developed Country (other advanced economy) |
| Poland | 2007 | Emerging (newly industrialized) country |
| Singapore | 2000 | Emerging (advanced) economy – since 1997 |
| South Africa | 2009 | Emerging (newly industrialized) country |
| Spain | 2010 | Developed Country (advanced economy) |
| Turkey | 2009 | Emerging (newly industrialized) country |
| United States of America | 2002, 2003, 2005, 2010, 2011 | Developed Country (advanced economy) |

[#] *Economic development classification obtained from IMF (2011; 2012)*

*Table 4.15 - Analysis of EMSIFs by economic status using FACES Model*

| **Economic Status** | **No of studies** | **Internal Neoclassical Efficient Choice EMSIFs** | **Study ratio** | **External Neoclassical Efficient Choice EMSIFs** | **Study ratio** | **Internal Social Institutional EMSIFs** | **Study ratio** | **External Social Institutional EMSIFs** | **Study ratio** |
|---|---|---|---|---|---|---|---|---|---|
| Developed countries | 11 | 32 | **2.9** (Highest ratio) | 12 | 1.1 | 14 | 1.2 | 16 | 1.4 |
| Emerging economies | 12 | 37 | **3** (Highest ratio) | 12 | 1 | 12 | 1 | 18 | 1.5 |
| Developing countries | 3 | 7 | 2.3 | 2 | **0.6** (Lowest ratio) | 5 | 1.6 | 4 | 1.3 |

Previous studies, though comparing pro-environmental behaviour within industry sectors or countries, have been unable to conduct comparisons or analyses across wider economic or geographic regions. However, categories in the FACES model encompass the main theoretical, functional and geographical perspectives in the consideration of organisational motivations, and provide for the clear analysis of EMSIFs affecting pro-environmental behaviour.

### 4.6.1 Usefulness and application of the FACES model

The FACES model is useful for analyzing a broad range of pro-environmental behaviours, including EMS implementation. The model is useful in examining EMSIFs reported from studies conducted across world regions, by enabling the analysis of different EMSIFs from the perspective of four divides. These divides represent all economic and social factors occurring from all sides and aspects of an organisation's environment. The model is also useful in analyzing trends in studies from different geographical and economic regions. Furthermore, the FACES model:

1) Addresses gaps and deficiencies of previous EMS categorisation models.
2) Presents a robust framework which encompasses all EMSIFS.
3) Is useful for categorising/classifying all EMSIFs.
4) Is functional in classifying EMSIFs across industry sectors, geographical locations and economic regions.
5) Is able to categorise all EMSIF types (drivers, benefits and barriers), unlike other categorisation models which categorise only single EMSIF types. As such the FACES model creates a platform for analyzing EMS drivers, benefits and barriers together, addressing the restrictions of previous models which analyse on one or two-type EMSIFs.
6) Is useful in analyzing the interplay between factors that influence organisational behaviour, and can lead to a better understanding of pro-environmental factors to which organisations respond.
7) Provides information which is instrumental in the creation of an enabling environment to encourage and nurture pro-environmental behaviour in organisations.

### 4.6.2 Geographic influences on pro-environmental behaviour

In the comparison of EMS studies according to geographical region, organisations in the Far East recorded the highest benefit study ratio, indicating that they derived more benefits from exhibiting pro-environmental behaviour such as EMS implementation. These organisations may also have recorded higher benefit ratios because they instead claimed more benefits for pro-environmental behaviour. More derived or claimed benefits in this region is likely to be because organisations in many emerging economies in the Far East

offer products and services to environmentally sensitive markets in Europe and North America. By adopting pro-environmental behaviours such as implementing EMSs, these organisations derive direct benefits in the form of market access and acceptability Babakri et al., 2002; Tan, 2003; Zutshi & Sohal, 2004; Jabbour et al., 2001). Sambasivan and Fei (2007) and Darnall et al (2008) conclude that organisations increasingly view internationally recognized EMS standards as a passport to access markets, especially global markets, and this export oriented approach leads organisations to improve on and develop environmental practices. On the converse, the potential market benefits of pro-environmental behaviour do not play a major role in motivating organisations in developing regions like Africa and West Asia. Organisations in this region may not operate in markets where customers strongly associate environmental performance with product quality, and do not have many international customers who demand demonstrable environmental performance. However, market access-driven advantages provided by EMS implementation may be based on perceived rather than actual realities. Previous research like Bellesi et al (2005) raises important issues about the actual value offered by pro-environmental behaviour (such as in EMS implementation), like the fact that products made by organisations with EMSs do not provide any particular economic advantage to the importers or purchasers of such products, except the implied dependability which such products might convey. This implied dependability, however, is very real, and so presents an economic reality to the organisations that produce or distribute them.

Study ratio findings are an indicator that fewer pro-environmental behaviour drivers exist for organisations in Africa and West Asia than in Central and South America, an observation consistent with the lower number of ISO 14001 certifications recorded in these world regions (ISO, 2013). However, this result may be due to study focus rather than EMSIFs orientation. For instance in Gavronski et al (2008), focus was placed on identifying motivations and benefits of ISO 14001 certification in Brazilian firms, whereas in Massoud et al (2010) the study focused on identifying all EMSIFs (drivers, benefits and barriers) related to implementing EMSs in Lebanese food manufacturing organisations.

Markets and communities in Africa and West Asia are less likely to experience stronger drivers for pro-environmental behaviour than their developed counterparts. Their markets are generally considered to be less environmentally sensitive, evidenced by such factors as less stringent and effectively enforced environmental regulations and standards, lower levels of literacy and reduced access to disposable economic resources (Turk, 2009;

Massoud et al., 2010). For instance in developing countries like Nigeria, the environmental regulatory system faces problems with inadequate enforcement, insufficient and inadequately trained regulatory personnel and, overlapping regulatory functions. Drivers for pro- environmental behaviour are more likely to stem from internal sources such as parent organisations and employees. Conversely, organisations operating in Europe experience fewer barriers to pro-environmental behaviour. The Europe region had the lower barrier study ratio, indicating that these organisations face fewer EMS barriers than their counterparts in other parts of the world. The existence of more stringent environmental standards and more environmentally sensitive communities in Europe is likely to explain this result.

The low barrier study ratio result for organisations in Europe explains the higher environmental standards and higher numbers of EMS certifications recorded in this region (ISO, 2011).

### 4.6.3 Economic influences on pro-environmental behaviour

The low study ratio for external neoclassical efficient choice factors for the developing country category can be explained by the lower levels of environmental regulation in many developing countries. Organisations operating in these regions are less likely to be strongly influenced by regulators, pressure groups and communities. This may be due to weaker regulatory control structures, inadequate legislation and standards and a less environmentally sensitive public.

Developed country organisations operate within societies with more structures for managing environmental issues, thereby raising general public consciousness of environmental issues. Organisations are therefore more likely to attempt to embed environmental considerations into main operations. They are also more likely to respond to societal views/pressures by seeking more environmentally-friendly and efficient ways to operate.

## 4.7 Research limitations and opportunities

The FACES model does not consolidate all possible previous EMS categorisation models reported in research studies and categorisation divides included in the model were limited to those reported in selected studies. The use of EMS study ratios in analyzing EMSIFS reported by previous studies is limited by the nature and focus of the studies being analysed.

There are opportunities for further analysis of EMSIFs across more current and future studies using the FACES model, in order to demonstrate the model's usefulness in analyzing EMSIFs across geographical, economical and functional boundaries. There is also an opportunity for the FACES model to be used to develop an analytical and diagnostic tool which may be used by government environment ministries and regulatory agencies to profile EMSIFs affecting pro-environmental behaviour in organisations on an industry-by-industry basis.

## 4.8 Summary

Previous EMS classification models investigated within the present study were geographically and economic context restrictive, preventing widespread meta-analysis of EMSIFs. The objective of this research chapter was to present a model for analyzing EMS implementation factors (EMSIFs). In achievement of this objective, the FACES model was developed and is useful for categorising EMSIFs for previous and future EMS research because; (1) it presents a robust model which encompasses and is useful for classifying EMSIFs; (2) the FACES model creates a platform for analyzing EMS drivers, benefits and barriers together; (3) it attends to deficiencies of previous EMS categorisation models, addressing their gaps; (4) it is functional in classifying EMS factors across a range of industry sectors, geographical locations and economic regions.

The FACES model developed within the present study was used successfully to re-categorise EMSIF findings of 22 previous studies, demonstrating the robustness and fitness-for-purpose of the FACES model across different geographic, organisational and economic contexts. A majority of EMSIFs reported from the 22 studies fell within the 'internal efficient choice factors' sub-category of the FACES model, indicating that

organisations surveyed were primarily driven by EMSIFs stemming from within the organisation, focusing on organisational performance, profitability and efficiency. When compared with other categorisation models, the FACES model was found to conduct a more efficient categorisation of EMSIFs.

Furthermore, geographical and economic trend analysis of the previous studies using the FACES model indicated that North American organisations are primarily affected by neoclassical efficient choice EMSIFs, while European organisations are primarily influenced by social institutional EMSIFs. Results provide an indication of both globally relevant study findings and geographic trends. Results also show the usefulness of the FACES model in determining geographic and economic trends in pro-environmental behaviour of organisations.

The FACES model is a robust and widely applicable method to categorise EMSIFs for meta-analysis and provides an important, internationally relevant tool for future research on the environmental behaviour of organisations. The FACES model, by analyzing the interplay between factors that influence organisational behaviour, can lead policy makers to better understand the factors to which organisations will respond, thereby assisting them in the creation of an enabling environment to encourage and nurture pro-environmental behaviour. This makes the model a vital tool which can inform policy making to enable environmental regulatory authorities' foster pro-environmental behaviour.

# CHAPTER FIVE

# IDENTIFICATION AND ANALYSIS OF FACTORS AFFECTING PROENVIRONMENTAL BEHAVIOUR (EMSIFs) USING THE FACES MODEL – A DEVELOPING COUNTRY CONTEXT

**Structure of Chapter Five**

## 5.1 Introduction

The new FACES model developed for categorising EMSIFs is useful for analysis across a range of geographic and economic regions. However, there have been inconsistencies in the number of EMS studies conducted across different world regions, with more studies being conducted in more economically developed countries. This research gap makes the comparative analysis of organisational pro-environmental behaviour difficult. To address the lack of EMS studies in developing regions, and to aid comparison of EMSIFs across different regions, this study is based in the developing country setting of Nigeria. EMSIFs in a sample of organisations in this developing country are identified and analysed using the FACES model.

A developing country is one is which 'there is a low living standard, an underdeveloped industrial base and a low Human Development Index (HDI), in comparison with other countries' (Sullivan and Sheffrin, 2003, p. 471). Though there is criticism about the use of the term 'developing country', and many countries classified as such generally dislike the reference, the use of world economic classifications is functional in describing practical economic indices within countries (Fung, 2009). Country economic classifications provide information which may have an impact on how a country manages environmental issues. By no means universally used (as the UN, the World Bank and other institutions have different classification systems), other country economic classifications include 'developed country', 'industrialized country', 'newly industrialized (or emerging) country', 'underdeveloped country', 'non-industrialized country' and 'less developed country'. Nigeria, selected as a focus for this study, is currently classified as a developing country (International Monetary Fund, IMF, 2012). Nigeria classified as 'low human development under HDI for 2012 was ranked 152$^{nd}$ out of 187 countries (HDR, 2014). Njoku and Orabuchi (2010), while asserting the importance of EMS adoption in Nigeria, recommended that research be carried out on the applicability of EMSs, on internal and external drivers of EMS implementation, and on an estimation of costs and benefits of the EMS approach in Nigeria.

The sections below provide an outlook on Nigeria, with an examination of the country's general environmental situation and the status of corporate environmental management within it. Section 5.2 presents the objectives for this part of the research; section 5.3 presents a review of the existing literature on Nigeria in relation with environmental

challenges it faces; section 5.4 describes the methods used; section 5.5 presents research findings, and section 5.6 discusses the findings.

## 5.2 Research objectives

The objectives of this research chapter are:

1. To identify factors affecting pro-environmental behaviour (EMSIFs) in a developing country context, and to categorise and analyse them using the developed model;
2. To determine patterns in pro-environmental behaviour by exploring the relationship between organisational characteristics and EMSIFs;
3. To identify geographic and economic patterns in pro-environmental behaviour by comparing EMSIFs identified from this research with EMSIFs identified by previous studies in other world regions;

## 5.3 Review of the literature

This literature review section gives an overview of Nigeria, the developing country setting in which this study is based. The section provides an outlook on Nigeria, with an examination of the country's basic information, its general environmental situation, the status of corporate environmental management within it, as well as its environmental management structure and challenges.

### 5.3.1 Nigeria – Basic information

There are powerful interactions between economic development and environmental quality in Nigeria, wherein the development process undermines further sustainable economic progress through environmental degradation. The quotes below from a number of research works on environmental issues in Nigeria illustrate this:

'For a country like Nigeria, which has been striving to attain meaningful development in agricultural and industrial sectors, and which has until recent years, paid little attention to environmental considerations, the need for sustainable development is imperative. Such sustainable development emphasizes the previously unappreciated role of environmental

quality and environmental inputs in the process of raising real income and quality of life…….' (Ogunleye & Alo, 2010, p. 279).

'Nigeria must take the lead in Africa for environmental innovations because of her position in the continent. More importantly, the heavy oil and gas exploration in Nigeria necessitates the importance of implementing an environmental management system like ISO 14001 EMS…..'(Njoku & Orabuchi, 2010, p. 1).

'Because Nigeria is a country that relies heavily on natural resources such as oil and arable land, there is a strong relationship between the Nigerian environment (natural resources) and its economic development. The mismanagement of the Nigerian environment could affect its economic development' (Adeyemo, 2006, p. 2).

The apparent need for improved management and control of these environmental impacts by developing country organisations may be addressed by a focus on proactive approaches to environmental management, through tools such as the EMS (Allen, 2011; Egunjobi, 2000; Njoku & Orabuchi, 2010).

Nigeria has many serious environmental issues, ranging from deforestation and biodiversity loss to air, water and ground pollution (Nigerian Conservation Foundation, NCF, 2009). The release of the United Nations Environmental Program (UNEP) Environmental Assessment Report on Ogoniland in the Niger delta region of southern Nigeria elicited serious reactions from corporate and local communities to the level and extent of environmental pollution in Nigeria in general, especially pollution caused by oil companies' activities in the study area (UNEP, 2011). As there is substantial industrial activity in the country, some significant environmental issues are caused by organisations' operational activities. In developing countries like Nigeria, organisations are seen as causative factors of environmental pollution and degradation, making the public place responsibility on them instead of governing authorities to solve or control environmental issues (Allen, 2011).

The Federal Republic of Nigeria is located in Western Africa (Figure 5.1) and borders the Gulf of Guinea between the Republic of Benin and Cameroon. It has a geographical coverage of 923,768 square km (land coverage of 913,768 square km and water coverage

of 13,000 square km) and a population of 156.05 million as at 2010[16]. According to the World Economic Outlook Report 2012, Nigeria had a real GDP of 7.1 for 2012 (also according to the same report, Nigeria's real GDP was 7.2 in 2011 with a projected GDP of 6.6 in 2013) (Nigeria, 2011).

Nigeria has a varied climate, equatorial in the south, tropical in mid-country and arid in the north. Its terrain is varied with rugged hills, undulating slopes, gullies and water-logged land. Vegetation ranges from mangrove or high forest in the south, savannah woodland or grasslands in mid-country to the desert in the north. Nigeria's main industries are oil and gas (upstream and downstream), agro-processing, manufacturing, iron/steel processing, farming, plastics, textiles and pharmaceuticals manufacturing (Nigeria, 2005).

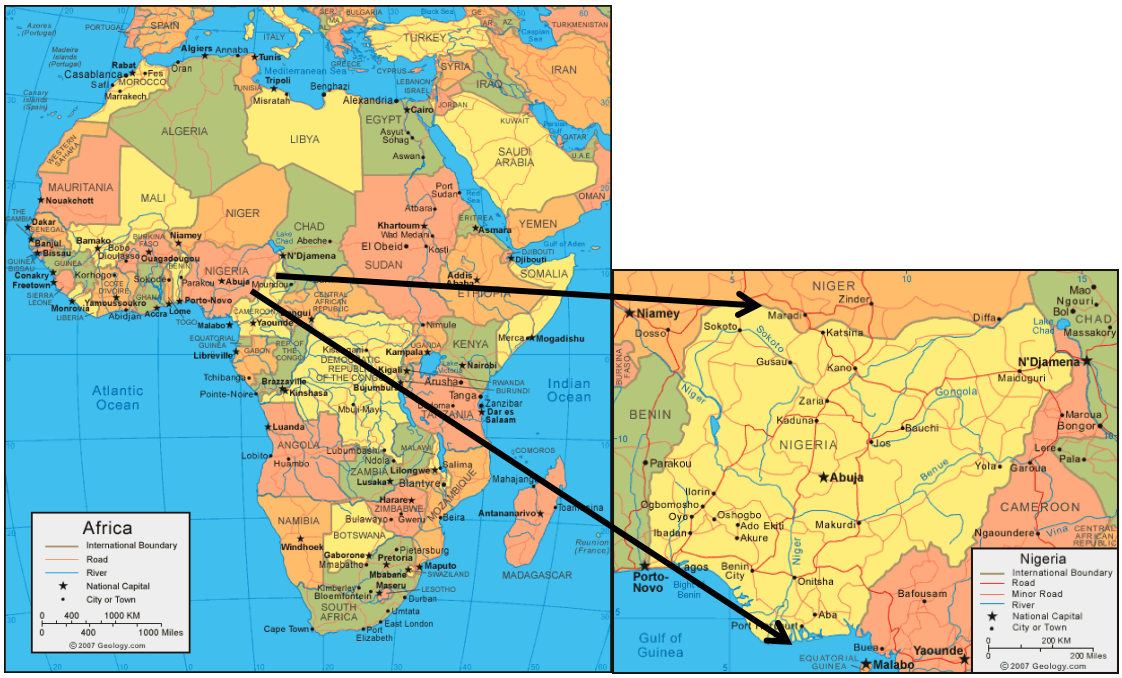



*Figure 5.1 – Map of Africa showing Nigeria (source – Geology.com)*

### 5.3.2 Nigeria's environmental challenges

The Nigerian environment is faced with many challenges, which can be divided into two groups – those that occur as a result of natural phenomena and those arising from human

16 This was a forecasted population figure for 2010. The last confirmed population figure of 118.95 million was obtained during a 2000 census. Nigeria has a forecasted population of 178.72 million for 2015

activities (Nigeria, 2005; NCF, 2009). A number of Nigeria's environmental problems arise as a result of natural phenomena and the country's unique physical features (NCF, 2009). These are shown in Table 5.1. Human activities also have an impact on the environment in Nigeria (NCF, 2009). Table 5.2 depicts a number of human activities that have had a significant negative impact on Nigeria's natural environment. However, regardless of the source of environmental problems, the government and general public is still likely to place responsibility for their solution on corporate organisations.

### 5.3.3 Managing Nigeria's environment

In 2008, Nigeria's Environmental Performance Index (EPIx)[17] ranking was 56.2, placing the country in a position of 126 out of 149 countries in the world. The fundamental causes of environmental problems are the unsustainable use of natural resources, unplanned urban development and large-scale pollution from poor municipal waste management, and unabated spillages from oil prospecting and production activities. Moreover the main environmental challenges in Nigeria – deforestation, desertification, soil erosion, coastal erosion, pollution and waste generation – have been exacerbated by poor management and prevention practices, with many Nigerian cities exhibiting inadequate population planning and growth control, poor town planning and unchecked environmental degradation (NCF, 2009). For instance, between 1976 and 1997, more than 2,676 separate oil pipeline spill incidents were reported in the country contributing substantially to Nigeria's environmental pollution problem (NCF, 2009). This, coupled with weak enforcement of environmental laws and weak compliance and policy practices has led to further worsening of degradation (United States Agency for International Development [USAID], 2002).

Organisations are viewed as being responsible for widespread environmental degradation, especially in developing countries where they operate largely unmonitored (Anderson, 2002). There is a link between Nigerian organisations and environmental degradation as a result of the propagation of environmentally degrading causes and activities, poor compliance with environmental laws, and poor management of environmental aspects. Nigerian organisations contribute to environmental problems in the country through a number of environmentally degrading activities, detailed in Table 5.2.

17 The Environmental Performance Index is a performance scale based on 25 performance indicators developed by the Yale University Centre for Environmental Law and Policy to assess environmental health and ecosystem vitality across 149 countries (Yale, 2008)

Organisations are faced with addressing environmental issues that arise as a direct result of their operations and those inherent in their operating environment which also includes the social aspects of environmental degradation. The environmental situation in Nigeria creates a complex problem for local and international organisations operating in the country. In addition to environmental degradation there are important social dimensions to environmental pollution including a lack of environmental justice and lack of transparency/accountability in decision making (Ogunleye & Alo, 2010). As these have been inadequately addressed by government and civil groups, there is pressure on organisations to play an important role in the resolution of these problems (Ameashi, 2006). This makes a proactive approach to environmental management, with the use of tools such as the EMS, needful. A proactive approach to environmental management will potentially afford a number of benefits to organisations in Nigeria by giving organisations the opportunity to control environmental issues before they materialize into problems, and by giving the learned and unlearned public the assurance that environmental issues are being pre-emptively managed.

### 5.3.4 Nigerian environmental legislation and regulation

In general, approaches to environmental management may be either reactive or proactive in nature. Reactive approaches typically involve the making and enforcing of laws applicable within a sustained regulatory environment which enables government to exact pressure on organisations, in order to produce various forms of regulated behaviour. In this way, environmental regulation attempts to modify organisational behaviour and elicit environmental behaviour more desired by government and society. Subsequently, the environmental regulatory setting instituted and maintained by governments seeks to alter organisational environmental behaviour (Tam, 2005). Proactive approaches to environmental management involve voluntary steps such as EMS adoption, which is taken independently by organisations to manage environmental aspects. In a proactive approach, the promotion and adoption of EMSs presents an important aspect in a new archetype for collaboration between regulators and organisations (Mohammed, 2001; Bellesi et al 2005).

Environmental regulation is not always reactive but depends on specific legal frameworks, regulatory styles and the structure of penalties/sanctions/incentives. Reactive (regulatory) and proactive (voluntary) environmental management approaches can also be

complementary and may be successfully combined. By establishing clear requirements and boundaries concerning environmental management, governments are able to influence organisations and play a pivotal role in improving environmental responsibility while achieving environmental preservation goals (Tam et al 2005).

*Table 5.1 –Nigeria's environmental problems as a result of natural phenomena*

| S/N | ENVIRONMENTAL PROBLEM(S) | MAIN ENVIRONMENTAL ATTRIBUTE | LOCATIONS |
|---|---|---|---|
| a | Coastal Erosion (exacerbated by global warming), sea-level rise | Coastlines – Nigeria is bordered by an 850km stretch of active coastline<br><br>All of Nigeria's eight coastal states are affected by serious coastal erosion problems. Coastal area erosion rates per annum range from 13m in Awoye/Molume to over 1300m at the Opobo River entrance (NCF, 2009) | Southern border of Nigeria along coast of the Atlantic ocean |
| b | Desertification (exacerbated by global warming) | Much of Nigeria is also bordered in the North by the Sahara desert<br><br>Approximately 50% to 75% of Bauchi, Borno, Gombe, Kano, Jigawa, Katsina, Kebbi, Sokoto, Zamfara and Yobe States of Nigeria, which account for 38% of the country's total land area, are under threats of desertification. In extreme parts of states such as Katsina, Sokoto, Jigawa, Borno and Yobe, entire villages and major access roads have been buried under sand dunes (NCF, 2009) | Northern border of Nigeria |
| c | Flooding | Much of Nigeria's coastal areas are low-lying, rising to a maximum of 5m above sea level | Coastal parts of Nigeria |
| d | Shoreline Erosion | Shorelines – Generally high and strong waves systems as a result of Nigeria's mid-latitude position in the Gulf of Guinea | Coastal shores of Nigeria |
| e | Rain Flooding, Leaching | Rainfall – As Nigeria lies within the equatorial belt, there are high levels of torrential rainfall ranging from lower levels of about 600mm in the North to over 3000mm in the South | From the coastal South to the North |
| f | Gully Erosion | Land surface – Over 40% of Nigeria's surface is covered by loose cretaceous sandstones and weathered basement rock, leading to loose sections easily susceptible to erosion after heavy rainfall<br><br>Soil erosion (in the form of sheet and gully erosion) is severe in Nigerian states like Edo, Anambra, Imo and Enugu. Over 550 gullies have been mapped in Anambra State alone, with soil loss and threat to agricultural production, homes and civil structures (NCF, 2009) | Country-wide |
| f | Deforestation | UNEP (2006) figures estimated that annual deforestation in Nigeria covers 663,000ha with an annual national deforestation rate of 0.76%. Vegetation and land use change data reports that the area covered by undisturbed forests in Nigeria between 1976 and 1995 decreased by 53.5%, from 25,951sqkm in 1976 to 12,114sqkm in 1991 (NCF, 2009). | Country-wide |

*Table 5.2 – Nigeria's environmental problems as a result of human activity*

| S/N | HUMAN ACTIVITY | OBSERVABLE ENVIRONMENTAL PROBLEM(S) |
|---|---|---|
| a | Continued Population Increase – From a population of 31.5 million in 1952/3, Nigeria's population grew to 175 million in 2003 and has a projected population of 289 million in 2050. This dramatic rise in population has put immense pressure on the country's economic and natural resources | Pollution (Air, noise, land)<br><br>Resource consumption/depletion |
| b | Urbanization and Industrialization – Increased urbanization has occurred very swiftly in Nigeria in the last three decades, with increased rates (The proportion of the population living in urban areas has risen from 15% in 1960 to 43.3% in 2000 with a projected rise to 60% by 2015 (Nigeria, 2005) a result of i) concentration of industrial activities in urban areas; ii) unchecked rural-urban migration; iii) rural-urban wage disparities | Waste generation and disposal problems<br><br>Pollution (Air, noise, land) |
| c | Agricultural Activity – Nigerian farming still uses old traditional methods, such as 'slash and burn', which are very harsh to farmland and usually render large expanses of land unusable. | Diminished soil fertility<br><br>Loss of biodiversity |
| d | Oil Exploration and related activities – Extensive and ill-managed oil prospecting and exploration have led to massive pollution in the Niger Delta area of Nigeria. This environmental threat is made worse by secondary activities such as illegal artisanal mining of crude oil and oil spillages from platforms and pipelines. | Pollution (Air, noise, land)<br><br>Atmospheric warming/Greenhouse effect |
| e | Other Mining Activity – Poorly managed open cast mining of minerals has also left large expanses of Nigerian land waste. | Deforestation |
| f | Bush Fires and Burning – Thousands of hectares of forest are lost annually as a result of indiscriminate fires caused by bush burning, game hunting, smoking and similar activities | Deforestation |
| g | Firewood harvesting and illegal logging – According to 1993 UN statistics, a staggering 76% of Nigeria's population uses firewood as its source of fuel for cooking. This heavy toll leads to rapid disappearance of forests. Illegal logging activities, especially when facilitated by mechanized machinery such as tractors, also leads to rapid loss of forest species and resources. | Deforestation |

### 5.3.5 The structure of environmental legislation in Nigeria

The Nigerian government's environmental management control efforts (acts, decrees, laws, bye-laws, edicts, regulations, policies, ratification of regional and international agreements, protocols and conventions) can be classified into:

a. Special Initiatives and Actions (International and Regional)
b. Policy and Institutional tools
c. Legal/Regulatory tools

These environmental management control efforts are implemented on two different levels of jurisdictional authority:

a. Federal – Federal environmental provisions have jurisdiction over the entire country
b. State – Environmental provisions applicable within each of the 36 states and capital city in Nigeria.

The promotion of environmental protection through the use of regulatory tools aimed at adjusting organisational behaviour has proved to be effective, and has been used in many countries, as early as the 1960's in the form of i) environmental regulations, ii) environmental fines and penalties, iii) voluntary environmental programs (Melnyk et al 2002). Governments basically lay down environmental laws and regulations which must be complied with by organisations in order to avoid incurring fines and penalties, whilst also encouraging these organisations towards greater environmental responsibility through the adoption of voluntary, non-government driven programs. Environmental legislation, in this manner, has been widely used in both developed and developing countries worldwide (Sambasivan & Fei 2007; Henri & Journeault 2007).

### 5.3.6 The evolution of environmental legislation in Nigeria

There are two distinct phases in the development of environmental legislation in Nigeria – the pre-1988 era comprising legal provisions dating from colonial governance and focused mainly on the oil industry, and the post 1988 era characterized by a clear national environmental policy and well-articulated environmental laws and regulations (Allen, 2011).

Nigerian environmental legislation include primary laws, which focus mainly on environmental issues and secondary laws which are not primarily focused on the environment but have environmental components. The evolution of environmental regulation in Nigeria shows a period of concentrated activity between the 1990's and the 2000's. This is likely to have occurred as a response to the hazardous waste dumping incident in Koko village in the former Bendel State of Niger Delta in 1987. Figure 5.2 shows the major environmental laws and policy tools which have been used by the Nigerian government, between 1950 to date, to control the environment.


*Figure 5.2 - A chronological overview of major federal environmental legislative, regulatory and policy instruments in Nigeria*

Sources – USAID 2002, NCF 2009, Allen 2011, Eneh 2011

**a. Pre 1970's**

As the mainstay of the Nigerian economy was agriculture prior to the discovery of oil in the late 1950's, there were few environmental provisions to address the environmentally degrading activity of oil prospecting and production (Echefu and Akpofure UNEP Case Study Report Year???). The main legal provision in the country during early years of independence which made reference to environmental control was the Forestry Act of 1958. After the discovery of oil, regulations controlling oil industry activities were drawn up and these contained references to environmental management (Echefu and Akpofure, Allen 2011). These regulatory tools include the Oil in Navigable Waters Regulation of 1968 and the Petroleum Act and Petroleum Drilling and Refining Regulations, both of 1969.

**b. 1970's – mid 1980's**

Once oil production began to increase in Nigeria, oil revenues subsequently grew. This led to a phase of rapid, unguided infrastructural and national development due to the lack of an adequate development policy. Existing environmental regulations from the 1950's and 1960's were bolstered with additional regulations – the Petroleum Refining Regulations of 1974 and the Land Use Act of 1978. These did little to control environmental degradation because of insufficient enforcement and punitive sanctions (Echefu and Akpofure 2004, Eneh, 2011).

**c. 1980's – 2000's**

After the hazardous waste dumping incident in Koko village, in former Bendel State of Nigeria, the Nigerian government became immediately more alert to the need for increased environmental regulation and protection, and the adoption of a more organized approach to environmental management. This resulted in the formulation of a spate of environmental policies and laws including, the Federal Environmental Protection Agency (FEPA) Act of 1988 leading to the formation of the now defunct Federal Environmental Protection Agency (FEPA, the Nigerian National Policy on Environment of 1989 and the Harmful Wastes (Special Criminal Provisions) Decree of 1990 (Echefu and Akpofure 2004, USAID, 2002, Allen, 2011, Eneh, 2011). Between the late 1980's to 2010, over 20 different pieces of environmental legislation were passed into law by the Nigerian government. These include the formulation of new laws such as the Environmental Impact Assessment Decree of 1992, the Environmental Guidelines and Standards for the

Petroleum Industry (EGASPIN) of 1992, the Endangered Species Act of 2004, and also the review of existing laws such as the Petroleum Drilling and Refining Regulations of 1990, the Petroleum Act 2004, and the Land Use Act of 2004. In 2007 the passing of the National Environmental Standards Regulatory and Enforcement Agency (NESREA) Act led to the formation of NESREA, a body responsible for maintaining environmental standards in the non-oil and gas sectors of Nigeria. The control of environmental issues in the oil and gas industry is managed by the Department of Petroleum Resources, an arm of the Federal Ministry of Environment which took over the activities of the defunct FEPA.

However, like several other developing countries, despite the existence of environmental protection laws, the Nigerian environment has suffered untold degradation, mainly because of government's focus on an economic development model powered by the growth of large enterprises, which depend on imported raw materials, machinery, technologies and local resources (Eneh, 2011).

**d. 2010's - date**

Since the formation of NESREA, the Nigerian government has developed a substantial number of environmental laws, a good number of which are geared towards controlling environmental issues in the non-oil and gas industry, which was hitherto largely unregulated. As before, the government faces the perennial problem of implementation and enforcement these new and existing laws, which must be addressed for existing legislation to be effective.

### 5.3.7 Nigeria's Support for International Environmental Agreements

The country, from the period of the 1960's to date, has participated in and ratified a notable number of international environmental treaties including:

1. The United Nations Conference on Human Environment (the Stockholm Declaration), 1972
2. The Vancouver Conference on Human Settlements, 1976
3. The Vienna Convention on Protection of the Ozone Layer, 1985
4. The Lugano Convention for Civil Liabilities resulting from activities dangerous to the Environment, 1993
5. The Istanbul Conference on Human Settlements, 1996

6. The Basel Convention for the Control of Transboundary Movement of Hazardous Wastes and their Disposal, 1992
7. The Kyoto Protocol (United Nations Framework Convention on Climate Change), 1997
8. The Rio de Janeiro United Nations Conference on Environment and Development (the Earth Summit), 1992. This led to the production of 5 documents:
    a. The Rio Declaration – Principles of a healthy environment and equitable development
    b. The Agenda 21 – an action plan for sustainable development in the 21st century
    c. The Convention on Biodiversity
    d. The Convention on Climate Change
    e. A statement of Forest Principles
9. The Rio de Janeiro United Nations Conference on Sustainable Development, 2012 (Rio 20+)

(Source: Eneh, 2011)

### 5.3.8 Challenges in environmental regulation in Nigeria

Allen (2011) observes that the Nigerian government has reacted to environmental consequences of oil exploration and production with policy interventions that mainly adopt a command and control approach e.g. civil and criminal laws. Many legal provisions in Nigeria are of a reactive nature, where stipulations are made as to expected requirements/standards and penalties set for breach/non-compliance. Although environmental control attempts to be proactive in the licensing/regulation of facilities by requiring permits/licences in advance of operations taking place, these efforts are often frustrated by poor implementation and enforcement. Environmental experts have also criticized Nigerian environmental legislation as placing the burden of proof on the aggrieved party in environmental disputes rather than on the aggressor, arguing that victims of environmental offences often do not have the means and should not have the responsibility of demonstrating the impacts of environmental degradation on them (Allen, 2011). This practice by the government has made organisations the direct target of negative sentiment and publicity, further placing pressure on them to demonstrate proactivity in managing environmental issues. Other challenges with the environmental management legal framework in Nigeria include:

a. A lack of cooperation between Federal and State environmental protection bodies
b. The existence of multiple overlapping functions within environmental protection bodies –Environmental regulatory bodies in Nigeria have several overlapping functions, jurisdictions and permitting systems, all of which lead to confusion in the implementation process. This overlap creates confusion for organisations that have to comply with various environmental regulations. Table 5.3 shows different environmental regulatory bodies in Nigeria with overlapping jurisdictions and functions.
c. Lack of funding, resources and institutional capacity for environmental control efforts – very few federal environmental offices, ministries and state environmental protection bodies have the requisite human resources, funding, equipment or skills to perform the work of environmental monitoring enforcement and control.
d. Poor governance – the Nigerian government has not demonstrated sufficient political will, commitment, focus or consistency required for sustained environmental effort.
e. The diffuse nature of Nigerian environmental policies – many environmental policies are not detailed enough to address the specific and complex issues requiring control.

(Allen, 2010 & Eneh, 2011)

Managing environmental issues in corporate organisations in Nigeria has also been fraught with challenges ranging from the poor handling of the direct impacts of organisational activities on the environment, to difficulties in persuading or influencing organisations to improve environmental performance (Ibeanu, 2000; Ite, 2004; Ite, 2007). Controlling the activities of organisations, especially those of large, multinational corporations has posed a challenge to regulatory bodies, as these organisations are often influential enough to control government actions in their own right.

In general, the environmental impact of corporate activities can no longer be solely controlled by command and control regulations. This is evidenced in a developing country like Nigeria, where there has been failure in implementation and enforcement of existing environmental legal tools. The failure by government results in the widespread ignorance of and lack of compliance with environmental standards. A regulatory-led promotion of proactive and preventive environmental management through the implementation of EMSs in organisations would be beneficial. Environmental regulators would also benefit greatly from understanding factors which influence organisations pro-environmental behaviour, to enable them foster conditions to promote and sustain desired behaviour.

*Table 5.3 – Environmental regulatory body functions and jurisdiction*

| SOME ENVIRONMENTAL REGULATORY BODIES IN NIGERIA | JURISDICTION | MAIN FUNCTIONS |
|---|---|---|
| Federal Ministry of Environment (FMEnv) | All organisations | • Prepare a comprehensive national policy for the protection of the environment and conservation of natural resources, including procedure for environmental impact assessment of all developing projects.<br>• Cooperate with federal and state ministries, local government, statutory bodies and research agencies on matters and facilities relating to the protection of the environment and the conservation of natural resources |
| Department of Petroleum Resources (DPR) | All organisations in the oil and gas sector | • Supervising all petroleum industry operations being carried out under licenses and leases in the country, in order to ensure compliance with the applicable laws and regulations. |
| Nigerian Environmental Standards Regulatory Agency (NESREA) | All organisations in the non-oil and gas sector | • Enforce compliance with laws, guidelines, policies and standards on environmental matters<br>• Coordinate and liaise with, stakeholders, within and outside Nigeria on matters of environmental standards, regulations and enforcement<br>• Enforce compliance with the provisions of international agreements, protocols, conventions and treaties on the environment including climate change, biodiversity conservation, desertification, forestry, oil and gas, chemicals, hazardous wastes, ozone depletion, marine and wild life, pollution, sanitation and such other environmental agreements as may from time to time come into force<br>• Enforce compliance with policies, standards, legislation and guidelines on water quality, Environmental Health and Sanitation, including pollution abatement. |
| Federal Ministry of Water Resources | All organisations involved in the use of water resources | • Formulates a national water resources policy towards ensuring adequate water supply for agricultural, industrial, recreational, domestic and other uses<br>• Formulates and implements a water resources master plan for the development of dams, irrigation and drainage, water supply, soil erosion and flood control as well as hydrological and hydro-geological activities. |
| Federal Ministry of Works and Housing | All organisations | • Planning, design, construction and rehabilitation of federal highways<br>• Supervision of the monitoring and maintenance of federal roads nationwide<br>• Provision of engineering infrastructure on federal highways |
| Federal Ministry of Agriculture and Rural Development | All organisations in the agro economic sector | • Regulates agricultural research, agriculture and national resources, forestry and veterinary research throughout Nigeria<br>• Supervises and provides funding for research institutes such as the national root crops research institute and colleges of agriculture and forestry<br>• Promotes agricultural development and management of national resources through agricultural value-chain approach, to achieve sustainable food security and production of agricultural raw materials to meet the needs of the expanding industrial sector. |
| Federal Ministry of Health | All organisations | • Provision of quality stewardship and services for the health of all Nigerians<br>• To develop and implement policies that strengthen the national health system for effective, efficient, accessible and affordable delivery of health services in partnership with other stakeholders. |
| Federal Ministry of Mines and Steel | All organisations | • Responsible for identifying solid minerals, advising government on the formulation and execution of laws and regulations guiding the various stages of prospecting, quarrying and mining; and handling sale and consumption of solid minerals in the country, through the issuance of permits, licenses, leases and collection of rents, fees and royalties. |
| Federal departments of forestry, regional, rural and urban planning | All organisations | Various functions |
| State environmental protection agencies | Organisations operating within Nigerian states | Regulation of environmental issues at a State level |

This focus of this chapter is to identify factors affecting pro-environmental behaviour (EMSIFs) in organisations operating in Nigeria, and to categorise and analyse these factors using the FACES model. The research chapter will also attempt to determine patterns in pro-environmental behaviour by exploring the relationship between organisational characteristics of Nigerian respondents and EMSIFs, while comparing EMSIFs identified from this research with EMSIFs identified by previous studies in other world regions;

## 5.4 Methods used

### 5.4.1 Questionnaire design and administration

A description of the approach to questionnaire design and administration is found in Chapter 3 of this thesis. A full description of the eight sections of the research questionnaire is found in Appendix 3G.

Information on respondents' organisational characteristics was collected through the questionnaire. Characteristics included:

1. Organisational size – Information on organisational size was collected in order to determine if this characteristic had any impact on pro-environmental behaviour.
2. Organisation industry – Main industry sectors were included in this category.
3. Organisation geographical zone/location (SW/SE/SS/NE/NC/NW)
4. Organisation turnover – The turnover of an organisation is an indicator of its size. This information was collected to determine if turnover had an impact on pro-environmental behaviour
5. Organisation ownership structure (Locally owned/Foreign owned/Mixed ownership)
6. Organisation corporate structure (Public/Limited liability/Sole or partnership)
7. Organisation level of environmental management. The levels of environmental management practiced by organisations were adapted from Webb et al, 2006.

Organisational respondents were asked to rate how important given EMSIFs were to their pro-environmental behaviour, using a Likert-type scale of 1 to 5 (where 1 = Very important, 2 = Import, 3 = Not sure, 4 = Of little importance, 5 = Not important).

EMSIFs in the questionnaire are represented within their applicable FACES model quadrants, as shown in Figure 5.2. As detailed in Chapter 4, the FACES model has positive and negative axes, where each quadrant contains positive and negative segments. The positive axes in the FACES model arises from EMSIFs which are either drivers or benefits, thereby exhibiting a 'positive' environmental influence on organisations. The negative portion arises from EMSIFs which are barriers to EMS implementation, exhibiting a 'negative' influence on organisations. Figure 5.3 shows which quadrant, whether positive (shaded in grey) or negative (shaded in blue), that each EMSIF falls into.

### 5.4.2 Data analysis

Methods adopted in analyzing data have been fully described in Chapter 3 of this thesis. In order to achieve set objectives, the following indices were used:

1. Summary (descriptive) statistics for questionnaire response data:
    a. Variable set 1 - Frequency distributions of geographical zone, organisational size, corporate structure, ownership structure, industry sector, organisational turnover and level of environmental management
    b. Variable set 2 - Percentage of organisations considering EMSIFs (drivers, benefits and barriers) to be 'Very Important' or 'Important'/Top five ranked EMSIFs
2. Inferential statistics for questionnaire response data:
    a. Tests for statistical significance for relationships between variable sets 1 and 2
    b. Analysis of responses using the FACES model
3. Comparison of EMSIF results with results from other world region studies

### 5.4.4 Variable description

The description and type of variables is shown in Table 5.4:

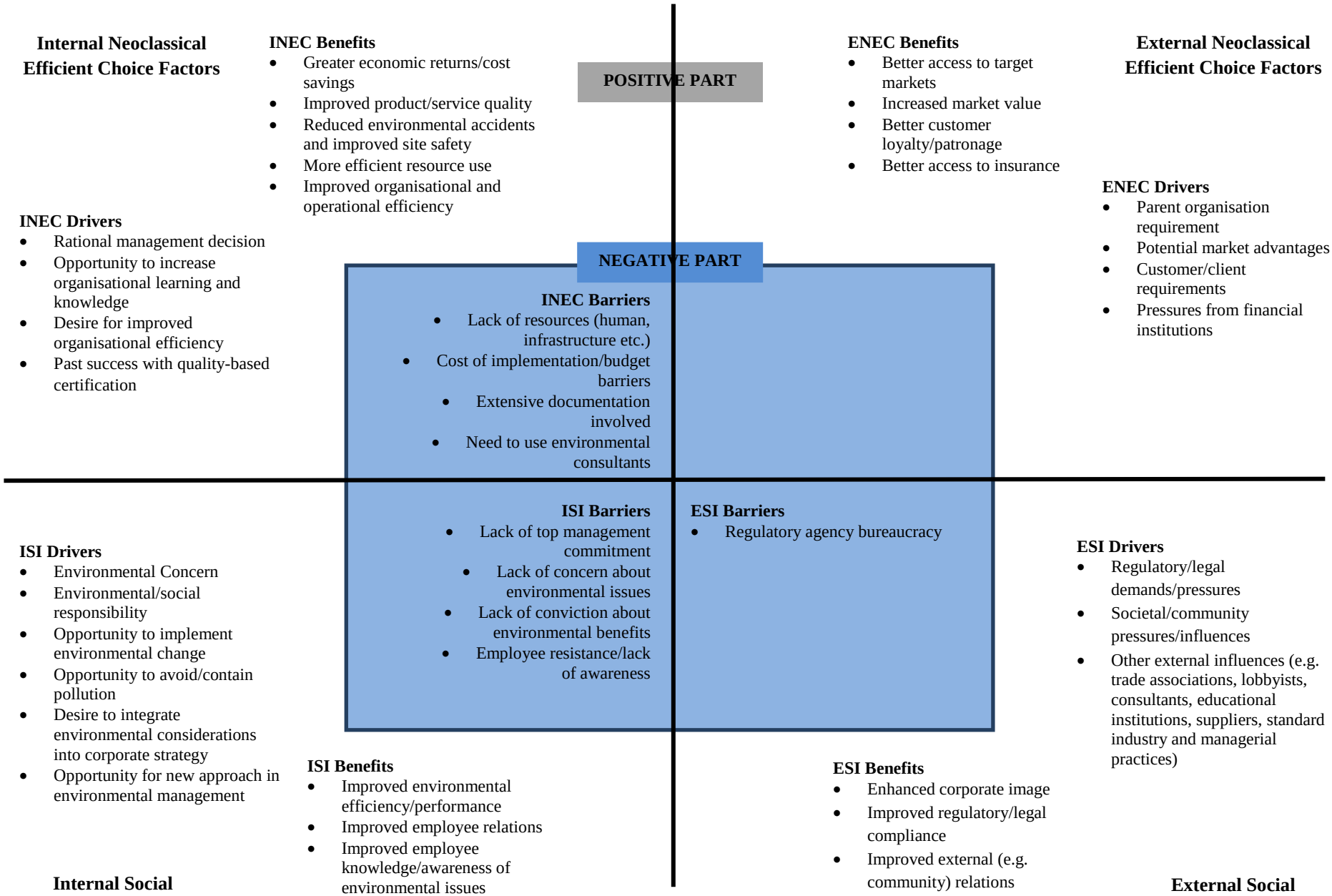





*Figure 5.3 – EMSIFs in research questionnaire showing positive and negative axes*

*Table 5.4 – Pro-environmental behaviour variables and levels of measurement*

| VARIABLE SET | VARIABLE NAME | TYPE/LEVEL OF MEASUREMENT |
|---|---|---|
| 1 | Geographical Zone | Nominal (Categorical Data) |
| 1 | Organisation Turnover | Nominal (Categorical Data) |
| 1 | Organisation Corporate Structure | Nominal (Categorical Data) |
| 1 | Organisation Size | Nominal (Categorical Data) |
| 1 | Organisation Ownership Structure | Nominal (Categorical Data) |
| 1 | Organisation Industry Sector | Nominal (Categorical Data) |
| 1 | Organisation Level of Environmental Management | Ordinal (Categorical Data) |
| 2 | Barriers to pro-environmental behaviour | Ordinal (Categorical Data) |
| 2 | Drivers to pro-environmental behaviour | Ordinal (Categorical Data) |
| 2 | Benefits of pro-environmental behaviour | Ordinal (Categorical Data) |
| 2 | Do you think that Nigerian legislation is appropriate/adequate with regard to corporate environmental management and implementation of EMS? | Nominal (Categorical Data) |
| 2 | Environmental Activities | Nominal (Categorical Data) |

## 5.5 Findings

### 5.5.1 Summary (descriptive statistics) for questionnaire response data

Tables 5.5 – 5.14 show frequencies for variable sets 1 and 2, as described in section 5.4.2.

### 5.5.2 Variable set 1 (organisational characteristics)

The frequencies for organisational characteristic variables (variable set 1) of respondents are shown in Tables 5.5 – 5.9. Figure 5.4 shows the distribution of respondent organisations across industry sectors.

The data reveals that 37.5% of respondent organisations were based in the Lagos region, while 33.5% and 20% were based in the North Central and South South geographical zones respectively. Only 5.5%, 3% and 0.5% of respondent organisations were based in the North East, South East and North West geographical zones. Response density is likely to be linked to organisational density, as there are significantly more organisations in the Lagos zone, which is the economic capital of Nigeria.

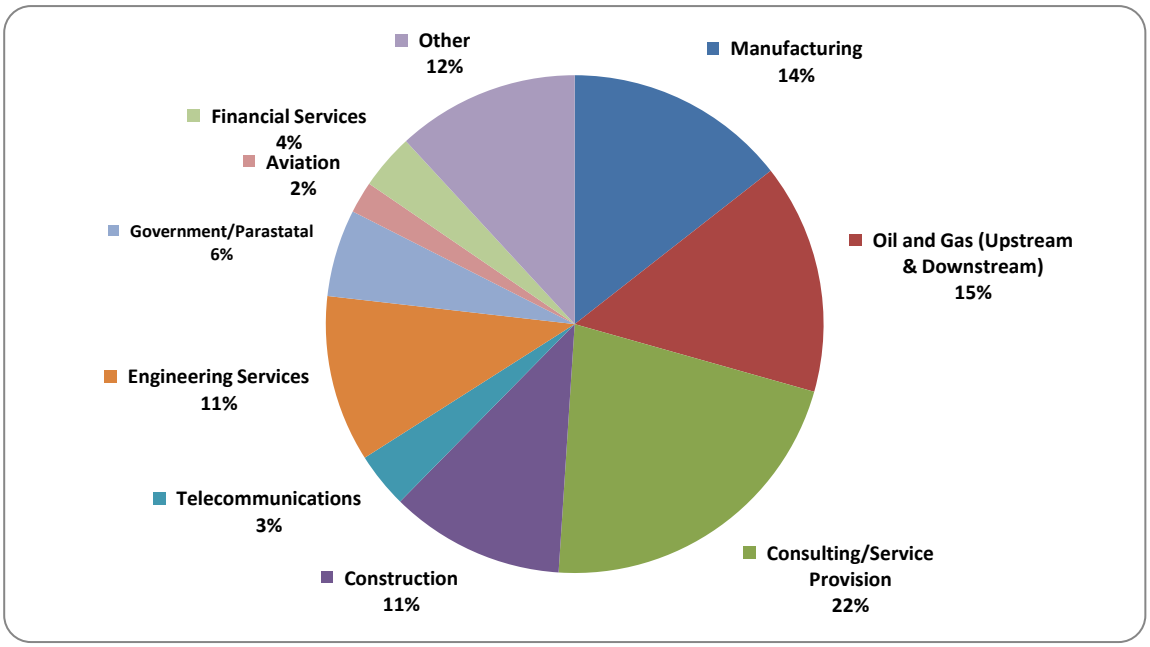



*Figure 5.4 – Industry sector distribution of respondents*

No organisations in the survey were based in the South West geographical zone. The reason for this is that sufficient resources were not available to distribute questionnaires in the South West zone. Furthermore, as the Lagos zone is located within the South West zone, responses from Lagos were considered to be representative of this zone. Geographical zone frequencies are shown in Table 5.5.

*Table 5.5 - Frequencies - geographical zone*

| Geographical Zone | Frequency | Percent | Valid Percent |
|---|---|---|---|
| 1 (Lagos) | 75 | 37.5 | 37.5 |
| 2 (SE) | 6 | 3.0 | 3.0 |
| 4 (SS) | 40 | 20.0 | 20.0 |
| 5 (NC) | 67 | 33.5 | 33.5 |
| 6 (NW) | 1 | 0.5 | .5 |
| 7 (NE) | 11 | 5.5 | 5.5 |
| **Total** | **200** | **100.0** | **100.0** |

Of the sample 22.5% of respondents had a turnover of less than 10 million NGN[18], while 27.5% and 12% had turnovers of 11 – 50 million and 51 – 100 million NGN respectively. The greatest majority of respondents (38%) had a turnover of greater than 100 million NGN. The frequency of respondents' turnover represents a good spread with each turnover category being reasonably represented. This is shown in Table 5.6.

*Table 5.6 - Frequencies - organisation turnover*

| Organisational Turnover | Frequency | Percent | Valid Percent |
|---|---|---|---|
| 1 (Below 10m NGN) | 45 | 22.5 | 22.5 |
| 2 (11 – 50mNGN) | 55 | 27.5 | 27.5 |
| 3 (51 – 100mNGN) | 24 | 12.0 | 12.0 |
| 4 (Above 100m NGN) | 76 | 38.0 | 38.0 |
| **Total** | **200** | **100.0** | **100.0** |

Only 17% of respondents had a public liability company corporate structure, while 72.5% had limited liability corporate structures. The remaining (10.5%) respondent organisations were partnerships/sole traders. In Nigeria, organisation size is not necessarily linked to corporate structure. This is because many organisations tend to adopt a limited liability structure by incorporating even very small organisations. The reason for this practice is not clear. Corporate structure frequencies are shown in Table 5.7.

*Table 5.7 - Frequencies - organisation corporate structure*

| Organisation Corporate Structure | Frequency | Percent | Valid Percent |
|---|---|---|---|
| 1 (Public) | 34 | 17.0 | 17.0 |
| 2 (Limited) | 145 | 72.5 | 72.5 |
| 3 (Partnership/Sole Trader) | 21 | 10.5 | 10.5 |
| **Total** | **200** | **100.0** | **100.0** |

A total of 27% of respondents had between 1- 10 employees, while 27.5% and 20% had 11 – 50 and 51 – 250 employees respectively. The remaining 25.5% of respondent

[18] 1NGN (Nigerian Naira) = 210USD (United States Dollar) as at May 2015

organisations had above 250 employees. Again, this represented a good spread of respondents. Organisation size frequencies are shown in Table 5.8.

*Table 5.8 - Frequencies - organisation size*

| Organisation Size | Frequency | Percent | Valid Percent |
|---|---|---|---|
| 1 (1 – 10 employees) | 54 | 27.0 | 27.0 |
| 2 (11 – 50 employees) | 55 | 27.5 | 27.5 |
| 3 (51 – 250 employees) | 40 | 20.0 | 20.0 |
| 4 (Above 250 employees) | 51 | 25.5 | 25.5 |
| **Total** | **200** | **100.0** | **100.0** |

Most of the respondent organisations (74%) were locally owned, while 12% were foreign owned. Only 14% of respondent organisations had a mixed ownership structure. This is shown in Table 5.9.

*Table 5.9 - Frequencies - organisation ownership structure*

| Organisation Ownership Structure | Frequency | Percent | Valid Percent |
|---|---|---|---|
| 1 (Locally owned) | 148 | 74.0 | 74.0 |
| 2 (Foreign owned) | 24 | 12.0 | 12.0 |
| 3 (Mixed ownership) | 28 | 14.0 | 14.0 |
| **Total** | **200** | **100.0** | **100.0** |

11.2% of respondents were ISO 14001 certified, while 15.8% were working towards ISO 14001 certification. 2.6% had some other formal EMS certification apart from ISO 14001. 17.9% of respondent organisations had an informal EMS in place, while 38.3% had some EMS system or procedures in place. 12.8% of respondents had no EMS system or procedures in place, while 1.5% described themselves as 'other'. This is shown in Table 5.10. The percentage of organisations (approximately 22) indicating they are ISO certified amongst respondents presents a number of possibilities – the first

is that this survey somehow managed to reach a large proportion of the ISO 14001 certified organisations in Nigeria, and the second is that respondents may have a different interpretation of what 'ISO certification' means. The third reason for this response may be that ISO certification numbers in the country are underreported, a fact acknowledged in many ISO annual reports.

*Table 5.10 - Frequencies – level of environmental management*

| Organisation Level of Environmental Management | Frequency | Percent | Valid Percent |
|---|---|---|---|
| 1 - ISO 14001 certified | 22 | 11.0 | 11.2 |
| 2 - Working towards ISO 14001 certification | 31 | 15.5 | 15.8 |
| 3 - Other formal EMS certification apart from ISO 14001 | 5 | 2.5 | 2.6 |
| 4 - Informal EMS in place | 35 | 17.5 | 17.9 |
| 5 - Some EMS system or procedures in place | 75 | 37.5 | 38.3 |
| 6 - No EMS system or procedures in place | 25 | 12.5 | 12.8 |
| 7 - Other | 3 | 1.5 | 1.5 |
| **Total** | **196** | **98.0** | **100.0** |

### 5.5.3 Variable set 2 (EMS drivers, benefits and barriers)

EMSIF variables were represented according to the FACES model categories under which they fall. FACES model categories were represented by the abbreviations INEC (Internal Neoclassical Efficient Choice Factors), ENEC (External Neoclassical Efficient Choice Factors), ISI (Internal Social Institutional Factors) and ESI (External Social Institutional Factors). Tables 5.10 – 5.13 show summary frequencies for variable set 2 i.e. respondents' responses on EMSIFs of pro-environmental behaviour.

The top five drivers identified as 'important' or 'very important' were rated as such by more than 80% of respondents. These EMSIF drivers are, in order of importance, 'environmental concern' (84.2%), 'the opportunity to avoid/contain pollution' (84%), 'desire to integrate environmental considerations into corporate strategy' (82.6%), 'environmental/social responsibility' 82.1% and 'regulatory/legal pressures' (81.4%). The top five EMS drivers (highlighted in orange) are shown in Table 5.11.

*Table 5.11 – Summary frequencies of drivers to pro-environmental behaviour*

| EMSIFs (Drivers) | Very important | Important | Not sure | Somewhat important | Not important |
|---|---|---|---|---|---|
| | % | % | % | % | % |
| Environmental concern | 52.7 | 31.5 | 6.8 | 6.8 | 2.1 |
| Opportunity to avoid/contain pollution | 42.7 | 41.3 | 7.0 | 5.6 | 3.5 |
| Desire to integrate environmental considerations into corporate strategy | 39.1 | 43.5 | 7.2 | 7.2 | 2.9 |
| Environmental/social responsibility | 46.4 | 35.7 | 8.6 | 7.1 | 2.1 |
| Regulatory/legal demands/pressures | 53.8 | 27.6 | 7.1 | 5.1 | 6.4 |
| Potential market advantages | 33.9 | 28.3 | 17.3 | 14.2 | 6.3 |
| Customer/client requirements | 33.6 | 34.4 | 16.0 | 7.2 | 8.8 |
| Opportunity for new approach in environmental management | 38.0 | 33.6 | 16.1 | 8.0 | 4.4 |
| Rational management decision | 25.8 | 39.2 | 20.8 | 8.3 | 5.8 |
| Opportunity to implement environmental change | 28.6 | 34.8 | 15.2 | 16.1 | 5.4 |
| Opportunity to increase organisational learning and knowledge | 27.3 | 43.9 | 11.4 | 10.6 | 6.8 |
| Societal/community pressures/influences | 19.2 | 23.2 | 18.4 | 26.4 | 12.8 |
| Other external influences | 20.3 | 24.6 | 16.9 | 23.7 | 14.4 |
| Desire for improved organisational efficiency | 46.0 | 30.9 | 3.6 | 15.1 | 4.3 |
| Parent org requirement | 25.0 | 16.7 | 11.7 | 6.7 | 40.0 |
| Past success with quality-based certification | 18.8 | 35.9 | 13.7 | 10.3 | 21.4 |
| Pressure from financial institutions | 14.9 | 17.5 | 20.2 | 25.4 | 21.9 |

The top five benefits identified as ‘important’ or ‘very important’ were also rated as such by more than 80% of respondents. These EMSIF benefits are, in order of importance, ‘enhanced corporate image’ (91.9%), ‘reduced environmental accidents and improved site safety’ (91.3%), ‘improved employee knowledge/awareness of environmental issues’ (85%), ‘improved organisational and operational efficiency’ (83.3%), ‘‘improved regulatory/legal compliance’ (81.1%). The top five EMS benefits (highlighted in orange) are shown in Table 5.12.

The top five barriers identified as ‘important’ or ‘very important’ were rated as such by more than lesser proportions of respondents. These EMSIF barriers are, in order of importance, ‘cost of implementation/budget barriers’ (72.9%), ‘regulatory agency bureaucracy’ (69.3%), ‘lack of resources’ (69.2%), ‘extensive documentation involved’ (65.3%), ‘lack of top management commitment’ (61.9%). The top five EMS barriers (highlighted in orange) are shown in Table 5.13.

*Table 5.12 – Summary frequencies of benefits to pro-environmental behaviour*

| EMSIFs (Benefits) | Very important | Important | Not sure | Somewhat important | Not important |
|---|---|---|---|---|---|
| | % | % | % | % | % |
| Enhanced Corporate Image | 64.0 | 27.9 | 5.9 | 1.5 | 0.7 |
| Reduced environmental accidents and improved site safety | 49.7 | 41.6 | 6.0 | 0.7 | 2.0 |
| Improved employee knowledge/awareness of environmental issues | 47.3 | 37.7 | 7.5 | 5.5 | 2.1 |
| Improved organisational and operational efficiency | 50.0 | 33.3 | 9.4 | 5.1 | 2.2 |
| Improved Regulatory/Legal Compliance | 52.4 | 28.7 | 14.0 | 2.1 | 2.8 |
| Better customer loyalty/patronage | 49.3 | 22.4 | 15.7 | 6.7 | 6.0 |
| Greater economic returns/cost savings | 41.8 | 30.6 | 14.9 | 7.5 | 5.2 |
| Increased Mkt Value | 39.8 | 26.6 | 19.5 | 7.0 | 7.0 |
| Improved environmental efficiency/performance | 51.0 | 26.2 | 15.2 | 6.2 | 1.4 |
| Better Access to Target markets | 35.4 | 22.8 | 25.2 | 7.9 | 8.7 |
| Improved product/service quality | 37.6 | 34.6 | 17.3 | 5.3 | 5.3 |
| Improved Employee Relations | 40.3 | 22.5 | 17.8 | 11.6 | 7.8 |
| Improved external (e.g. community) relations | 45.4 | 35.4 | 6.9 | 10.0 | 2.3 |
| More Efficient Resource Use | 54.7 | 31.4 | 8.0 | 2.2 | 3.6 |
| Better Access to Insurance | 25.2 | 24.3 | 24.3 | 10.3 | 15.9 |

*Table 5.13 – Summary frequencies of barriers to pro-environmental behaviour*

| EMSIFs (Barriers) | Very important | Important | Not sure | Somewhat important | Not important |
|---|---|---|---|---|---|
| | % | % | % | % | % |
| Cost of implementation/budget barriers | 35.6 | 37.3 | 11.9 | 5.9 | 9.3 |
| Regulatory Agency Bureaucracy | 36.0 | 33.3 | 12.6 | 11.7 | 6.3 |
| Lack of resources | 29.8 | 39.4 | 5.8 | 7.7 | 17.3 |
| Extensive documentation involved | 26.5 | 38.8 | 7.1 | 10.2 | 17.3 |
| Lack of top management commitment | 40.0 | 21.9 | 14.3 | 9.5 | 14.3 |
| Need to use external consultants | 31.0 | 24.0 | 14.0 | 11.0 | 20.0 |
| Employee resistance/lack of awareness | 13.3 | 37.8 | 16.3 | 7.1 | 25.5 |
| Lack of conviction about environmental benefits | 26.0 | 23.0 | 16.0 | 11.0 | 24.0 |
| Lack of concern about environmental issues | 19.5 | 31.9 | 12.4 | 15.0 | 21.2 |

Figure 5.5 shows the top 5 EMS drivers, benefits and barriers, as represented in their respective FACES categories.

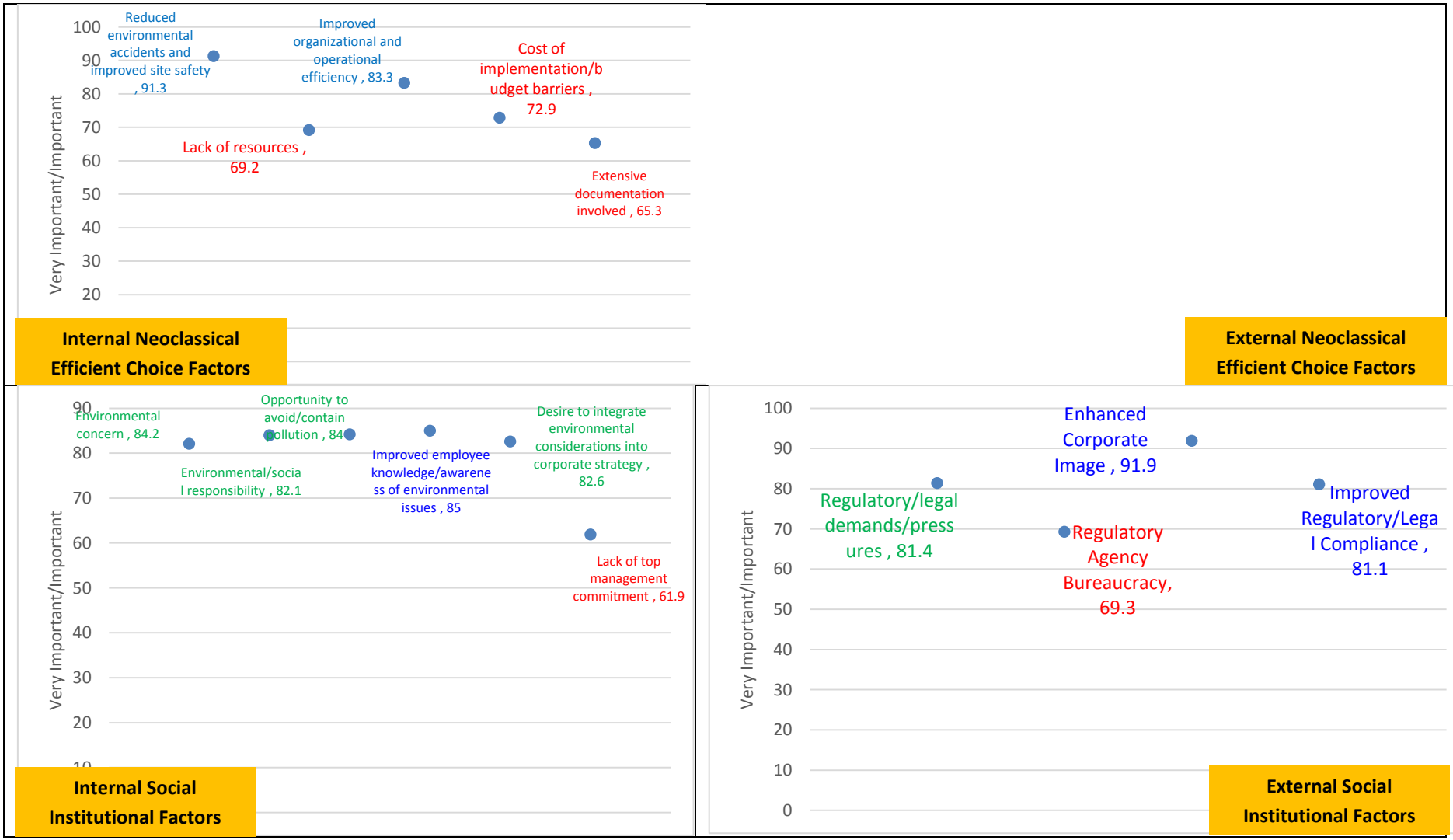



*Figure 5.5 – Top 5 EMSIFs shown within FACES model*

**KEY** Drivers Benefits Barriers
Green text Blue text Red text

### 5.5.4 Inferential statistical analysis - relationships between variables

To better understand the relationship between organisations' pro-environmental behaviour and EMSIFs, the existence of relationships between variable set 1 (i.e. organisational characteristics) and variable set 2 (i.e. EMSIF variables) was investigated. The two variable sets comprised categorical data which were either nominal or ordinal in nature, and which were not normally distributed.

Generally, the relationship between categorical variables which do not meet all the requirements for normality can be investigated by determining the existence of significant relationships using the Chi-square statistics ($\chi^2$) test, where:

*If ($\chi^2$) p-value < 0.05, the relationship between variables is significant,*

*If ($\chi^2$) p-value < 0.01, the relationship between variables is highly significant and,*

*If ($\chi^2$) p-value < 0.001, the relationship between variables is very highly significant*

The Chi-square test was used to determine the existence of significant relationships which are meaningful and require explanation or interpretation. This test provides information about the relationships between categorical variables by summarizing the difference between actual and expected counts into a p-value (Wiredu, 2014). The null hypothesis (that there is no significant relationship between variables) is rejected if the test's p-value is less than 0.05. Conversely, a p-value greater than 0.05 signifies that there is no statistically significant relationship between the two variables i.e. the null hypothesis is accepted. For instance, a p-value of 0.836 for the cross tabulation between the variable 'industry sector' and the EMSIF 'lack of resources' shows that an organisation's 'industry sector' does not affect its rating of the importance of the INEC barrier 'lack of resources'. Conversely, a p-value of 0.006 for the cross tabulation between the variable 'organisation size' and the EMSIF driver 'societal/community influences/pressures' signifies that there is a highly significant statistical relationship between an organisation's size and the 'societal/community influences/pressures' it faces. This indicates that the size of organisations affects how important societal/community influences/pressures are to organisations.

To ensure greater reliability, and to address problems with low expected counts of variables (which could lead to inaccurate Chi-square p-values), the Monte Carlo exact

test was conducted alongside all Chi-square tests. The Monte Carlo method is less computationally intensive and consistently provides p-values which are closely related to Chi-square p-values. This exact test was useful for cross-checking the accuracy of Chi-square p-values. For increased accuracy, relationships were therefore only considered significant if the Monte Carlo p-value was less than 0.05.

Table 5.14 below shows variable relationships with significant Chi square and Monte Carlo p-values.

### 5.5.5 Contingency table analysis (and computation of measures of association) of significant relationships

Further analysis in the form of examination of R x C contingency tables was carried out on variable relationships with a $\chi^2$ (and Monte Carlo) p-value less than 0.05, to determine the nature of significant relationships. Relative percentages for each variable category within contingency tables were compared to determine the direction of significant relationships.

As the chi-square statistic is unable to indicate the strength or direction of significant variable relationships, measures of association are computed to achieve this outcome. Two measures of association – Cramer's V and Kendall's $Tau_c$ – were used due to their suitability for determining associations of nominal and ordinal variables respectively. In using measures of association, values typically range from 0 to 1, and indicate the actual accuracy/strength of a statistically significant relationship identified by the chi-square statistic. Specifically:

*A value of >+ or - 0.3 indicates a high (strong) association*

*A value of + or - 0.2 to + or - 0.29 indicates a moderate association*

*A value of + or - 0.1 to + or - 0.19 indicates a low (weak) association*

*A value of 0 to + or - 0.1 indicates very low (if any) association*

Computed Cramer's V and Kendall's $Tau_c$ values for significant relationships are shown in Table 5.14.

### 5.5.6 Nature of strong/moderate significant variable relationships

Contingency tables for each variable relationship with a strong or moderate association were re-examined to better understand their direction and to determine the impact of organisational characteristics on responses to EMSIFs. The geopolitical (geographical) zone and industry sector in which organisations operate were the most influencing organisational characteristics determining their pro-environmental behaviour. These two organisational characteristics represented 20 out of 30 of the strong/moderate associations in significant variable relationships. Findings are shown below.

#### 5.5.6.1 Geopolitical zone and EMSIFs

1. Geopolitical Zone/Benefit (Greater economic returns/Cost savings) – Organisations in the Lagos, South South and North Central zones had higher percentage ratings of 'very important/important' for this EMSIF (76%, 71% and 62% respectively) than other geopolitical zones.
2. Geopolitical Zone/Driver (Customer/Client requirements) - Organisations in the Lagos, North Central and South South zones had higher percentage ratings of 'very important/important' for this EMSIF (74%, 69% and 60% respectively) than other geopolitical zones.
3. Geopolitical Zone/Benefit (Better customer loyalty/patronage) - Organisations in the Lagos, South East and South South zones had higher percentage ratings of 'very important/important' for this EMSIF (80%, 80% and 71% respectively) than other geopolitical zones.
4. Geopolitical Zone/Benefit (Better access to target markets) - Organisations in the South East and Lagos zones had higher percentage ratings of 'very important/important' for this EMSIF (100% and 60% respectively) than other geopolitical zones.
5. Geopolitical Zone/Benefit (Better access to insurance) - Organisations in the South East and Lagos zones had higher percentage ratings of 'very important/important' for this EMSIF (100% and 57% respectively) than other geopolitical zones.

*Table 5.14 – Pearson's Chi-square p-values and measure of association for significant variable relationships*

| Variable Set 1 (Organisational Characteristics) | FACES Category | Variable Set 2 (EMSIFs) | Significant Chi Square/Monte Carlo p-values | Cramer's V/Kendall's $Tau_c$ | Strength of Association |
|---|---|---|---|---|---|
| Geographical Zone | INEC | Benefit (Greater economic returns/Cost savings) | 0.001/0.004 (HS) | 0.293 | Moderate |
| | ENEC | Driver (Customer/Client requirements) | 0.029/0.029 (S) | 0.238 | Moderate |
| | ENEC | Benefit (Better customer loyalty/patronage) | 0.012/0.021 (S) | 0.262 | Moderate |
| | ENEC | Benefit (Better access to target markets) | 0.047/0.048 (S) | 0.250 | Moderate |
| | ENEC | Benefit (Better access to insurance) | 0.009/0.010 (HS) | 0.275 | Moderate |
| | ISI | Barrier (Employees resistance/Lack of awareness) | 0.044/0.042 (S) | 0.261 | Moderate |
| | ISI | Barrier (Lack of concern about environmental issues) | 0.001/0.000(VHS) | 0.344 | Strong |
| | ISI | Barrier (Lack of conviction about environmental benefits) | 0.003/0.001 (VHS) | 0.305 | Strong |
| | ESI | Driver (Societal/community influences/pressures) | 0.007/0.004 (HS) | 0.279 | Moderate |
| | ESI | Benefit (Improved external/community relations) | 0.019/0.048 (S) | 0.261 | Moderate |
| Industry Sector | INEC | Driver (Desire for improved organisational efficiency) | 0.003/0.007 (HS) | 0.337 | Strong |
| | INEC | Benefit (Greater economic returns/Cost savings) | 0.001/0.003 (HS) | 0.357 | Strong |
| | INEC | Benefit (Improved organisational and operational efficiency) | 0.010/0.019 (S) | 0.326 | Strong |
| | ENEC | Benefit (Better customer loyalty/patronage) | 0.020/0.024 (S) | 0.322 | Strong |
| | ENEC | Benefit (Better access to target markets) | 0.049/0.049 (S) | 0.317 | Strong |
| | ISI | Driver (Opportunity to avoid/contain pollution) | 0.002/0.006 (HS) | 0.338 | Strong |
| | ISI | Driver (Opportunity for new approach in environmental management) | 0.046/0.050 (S) | 0.306 | Strong |
| | ISI | Benefit (Improved environmental efficiency/performance) | 0.025/0.047 (S) | 0.306 | Strong |
| | ISI | Benefit (Improved employee relations) | 0.027/0.024 (S) | 0.324 | Strong |
| | ESI | Driver (Societal/community influences/pressures) | 0.031/0.024 (S) | 0.327 | Strong |
| Organisational Turnover | INEC | Barrier (Need to use external consultants) | 0.001/0.001 (VHS) | +0.227 | Moderate |
| | ENEC | Benefit (Better access to target markets) | 0.044/0.043 (S) | +0.134 | Weak |
| | ISI | Barrier (Lack of top management commitment) | 0.001/0.001 (VHS) | -0.110 | Weak |
| | ISI | Driver (Environmental/Social responsibility) | 0.028/0.24 (S) | +0.127 | Weak |
| | ISI | Benefit (Improved environmental efficiency/performance) | 0.020/0.017 (S) | -0.006 | Very weak |
| | ESI | Driver (Legal/Regulatory demands) | 0.020/0.019 (S) | -0.082 | Very weak |
| | ESI | Driver (Societal/community influences/pressures) | 0.046/0.045 (S) | -0.019 | Very weak |
| | ESI | Benefit (Improved external/community relations) | 0.042/0.038 (S) | +0.084 | Very weak |

*(S) – Significant, (HS) – Highly Significant, (VHS) – Very Highly Significant*

*Table 5.14 (cont.) – Pearson's Chi-square p-values and measure of association for significant variable relationships*

| Variable Set 1 (Organisational Characteristics) | FACES Category | Variable Set 2 (EMSIFs) | Significant Chi Square/Monte Carlo p-values | Cramer's V/Kendall's $Tau_c$ | Strength of Association |
|---|---|---|---|---|---|
| Organisational Size | INEC | Barrier (Lack of resources) | 0.020/0.018 (S) | +0.075 | Very weak |
| | INEC | Barrier (Need to use external consultants) | 0.028/0.025 (S) | +0.310 | Strong |
| | INEC | Benefit (Reduced environmental accidents/Improved site safety) | 0.005/0.001 (VHS) | -0.150 | Weak |
| | ENEC | Driver (Potential market advantages) | 0.008/0.007 (HS) | -0.064 | Very low |
| | ENEC | Benefit (Better access to target markets) | 0.017/0.017 (S) | +0.740 | Strong |
| | ISI | Barrier (Lack of top management commitment) | 0.008/0.007 (S) | -0.142 | Weak |
| | ISI | Driver (Opportunity for new approach in environmental management) | 0.050/0.044 (S) | +0.605 | Strong |
| | ISI | Benefit (Improved environmental efficiency/performance) | 0.017/0.012 (S) | +0.110 | Weak |
| | ESI | Driver (Societal/community influences/pressures) | 0.006/0.004 (HS) | +0.023 | Very weak |
| | ESI | Benefit (Improved external/community relations) | 0.012/0.010 (HS) | +0.069 | Very weak |
| | ESI | Benefit (Enhanced corporate image) | 0.021/0.009 (HS) | -0.083 | Very weak |
| Organisation Ownership Structure | ENEC | Driver (Parent organisation requirement) | 0.048/0.042 (S) | 0.255 | Moderate |
| | ISI | Benefit (Improved environmental efficiency/performance) | 0.011/0.022 (S) | 0.261 | Moderate |
| | ESI | Benefit (Improved external/community relations) | 0.013/0.014 (S) | 0.273 | Moderate |
| Organisational Corporate Structure | INEC | Barrier (Need to use external consultants) | 0.007/0.007 (HS) | 0.324 | Strong |
| | ISI | Driver (Opportunity for new approach in environmental management) | 0.013/0.014 (S) | 0.266 | Moderate |
| | ISI | Benefit (Improved employee relations) | 0.038/0.035 (S) | 0.252 | Moderate |

*(S) – Significant, (HS) – Highly Significant, (VHS) – Very Highly Significant*

6. Geopolitical Zone/Barrier (Employees resistance/Lack of awareness) - Organisations in the North Central zone had the highest percentage ratings of 'very important/important' for this EMSIF (65%), while the Lagos and South South zones had lower percentages (47% and 37% respectively.
7. Geopolitical Zone/Barrier (Lack of concern about environmental issues) - Organisations in the North Central zone also had higher percentage ratings of 'very important/important' for this EMSIF (69%) while the Lagos and South South zones had lower percentages (45% and 40% respectively).
8. Geopolitical Zone/Barrier (Lack of conviction about environmental benefits) - Organisations in the North Central and North East zones had higher percentage ratings of 'very important/important' for this EMSIF (78% and 71% respectively) while the Lagos and South South zones had lower percentages (34% and 32% respectively).
9. Geopolitical Zone/Driver (Societal/community influences/pressures) - Organisations in the South South zone had highest percentage ratings of 'very important/important' for this EMSIF (57%).
10. Geopolitical Zone/Benefit (Improved external/community relations) - Organisations in all zones generally had higher percentage ratings of 'very important/important' for this EMSIF (South East – 100%, North West – 100%, North East – 100%, South South – 86%, Lagos – 78%, North Central – 71%).

#### 5.5.6.2 Industry sector and EMSIFs

1. Industry Sector/Benefit (Better customer loyalty/patronage) – this EMSIF was rated 'very important' or 'important' by 100% of respondents in the aviation industry sector. Organisations in the construction, consultancy/service provision, telecommunications, engineering, oil/gas, and 'other industry' also rated this EMSIF 'very important' or 'important' (95%, 83%, 80%, 69%, 65 and 67% respectively). Organisations in the financial services sector had the highest rating of 'not sure' (60%), indicating an ignorance or lack of awareness of this and possibly other EMSIFs.
2. Industry Sector/Benefit (Better access to target markets) - this EMSIF was rated 'very important' or 'important' by 100% of respondents in the aviation industry sector. Although organisations in the construction, consultancy/service provision and oil/gas rated this EMSIF 'very important' or 'important' (76%, 68% and 53% respectively),

ratings of ‘not sure’ were also relatively high for organisations in the financial services sector, telecommunications, government/parastatal and manufacturing sectors (60%, 50%, 33% and 32% respectively). This indicates ignorance or lack of awareness of the relevance and functionality of this and possibly other EMSIFs in these sectors.

3. Industry Sector/Driver (Desire for improved organisational efficiency) - This EMSIF was ‘very important’ or ‘important’ for a number of industry sectors. Organisations in the manufacturing, engineering, consultancy and service provision, oil and gas, government/parastatal, construction and ‘other industry’ rated this EMSIF ‘very important’ or ‘important’ (88%, 85%, 83%, 78%, 71%, 65% and 90% respectively). Ratings for ‘somewhat important’ and ‘not important’ were high for organisations in the aviation, telecommunications industries (75% and 40% respectively).
4. Industry Sector/Benefit (Greater economic returns/Cost savings) - This EMSIF was ‘very important’ or ‘important’ for a number of industry sectors. Organisations in the construction, manufacturing, consultancy/service provision, telecommunications, government/parastatal and oil/gas, and ‘other industry’ rated this EMSIF ‘very important’ or ‘important’ (100%, 87%, 76%, 75%, 71%, 70% and 62% respectively). Ratings for ‘somewhat important’ and ‘not important’ were high for organisations in the aviation, industry (100%).
5. Industry Sector/Benefit (Improved organisational and operational efficiency) – This EMSIF was ‘very important’ or ‘important’ for a number of industry sectors. Organisations in the construction, manufacturing, oil/gas, government/parastatal, consultancy/service provision, and engineering, ‘other industry’ and telecommunication industries rated this EMSIF ‘very important’ or ‘important’ (100%, 91%, 90%, 86%, 82%, 79%, 70%, and 67% respectively). Ratings for ‘somewhat important’ and ‘not important’ were high for organisations in the aviation, industry (67%). Furthermore, organisations in the financial services sector had the highest rating of ‘not sure’ (40%), indicating an ignorance or lack of awareness of this and possibly other EMSIFs.
6. Industry Sector/Driver (Opportunity to avoid/contain pollution) - this EMSIF was rated ‘very important’ or ‘important’ by 100% of respondents in the ‘other industry’ sector. Organisations in the construction, manufacturing, consultancy/service provision, oil/gas, telecommunication, engineering and government/parastatal rated this EMSIF ‘very important’ or ‘important’ (94%, 88%, 88%, 86%, 80%, 71% and 71% respectively). 50% of respondents in the aviation industry rated this EMSIF as ‘not

sure' indicating ignorance or lack of awareness of the relevance and functionality of this and possibly other EMSIFs.

7. Industry Sector/Driver (Opportunity for new approach in environmental management) -this EMSIF was rated 'very important' or 'important' by 100% of respondents in the aviation industry sector. Although organisations in the engineering, consultancy/service provision, construction and telecommunication rated this EMSIF 'very important' or 'important' (87%, 85%, 83% and 82% respectively), ratings for 'not sure' were also rated relatively high by organisations in the financial services and aviation sectors (50% and 50% respectively). This indicates ignorance or lack of awareness of the relevance and functionality of this and possibly other EMSIFs in these sectors.
8. Industry Sector/Benefit (Improved environmental efficiency/performance) - This EMSIF was rated 'very important' or 'important' by 100% of respondents in the government/parastatal sector. Organisations in the construction, oil and gas, 'other industry', consultancy/service provision, telecommunication, manufacturing and engineering rated this EMSIF 'very important' or 'important' (94%, 86%, 80%, 78%, 75%, 71% and 63% respectively). 60% of respondents in the financial services sector were 'not sure' and 67% of organisations in the aviation sector rated this EMSIF as 'somewhat important' or 'not important'.
9. Industry Sector/Benefit (Improved employee relations) - This EMSIF was rated 'very important' or 'important' by 100% of respondents in the telecommunication sector. Organisations in the construction, 'other industry', oil and gas, manufacturing, consultancy/service provision and financial services sector rated this EMSIF 'very important' or 'important' (83%, 70%, 65%, 62%, 61% and 60%). 67%, 50% and 40% of respondents in the aviation, government/parastatal and financial services sectors were 'not sure' about this EMSIF.
10. Industry Sector/Driver (Societal/community influences/pressures) - This EMSIF was rated 'somewhat important' or 'not important' by respondents in the aviation, manufacturing and telecommunication sector (75%, 64%, 60% respectively). Organisations in the 'other industry', oil and gas, government/parastatal and engineering rated this EMSIF 'very important' or 'important' (63%, 61%, 60% and 54%). 40% of respondents in both financial services and government/parastatal sectors were 'not sure' about this EMSIF.

#### 5.5.6.3 Organisational size and EMSIFs

1. Organisational Size/Driver (Opportunity for new approach in environmental management) - The smaller the organisation size, the more important this EMSIF was. This is shown by in the decreasing ratings with 84%, 80%, 58% and 61% of organisations with 1 – 10, 11 – 20, 51 – 250 and above 250 employees respectively rating this EMSIF as 'important' or 'very important'. 20% of organisations with above 250 employees were either 'not sure' or rated this EMSIF as 'somewhat important' or 'not important'.
2. Organisational Size/Barrier (Need to use external consultants) – The smaller the organisation size, the more important this EMSIF was. This is shown by the fact that 74% of organisations with 1 – 10 employees rated this EMSIF as 'important' or 'very important', while only 25% of organisations with above 250 employees did the same.
3. Organisational Size/Benefit (Better access to target markets) - This EMSIF was rated 'very important' or 'important' by respondents with 1- 10 employees, 51 – 250 employees and above 250 employees (60%, 62%, 65% respectively). However 40% and 29% respectively of organisations with 1- 10 employees, 51 – 250 employees were 'not sure' of the importance of this EMSIF to their pro-environmental behaviour.

#### 5.5.6.4 Organisational turnover and EMSIFs

1. Organisational Turnover/Barrier (Need to use external consultants) – Organisations with a lower turnover (NGN1 – 10m, NGN11 – 50m and NGN51 – 100m) rated this EMSIF higher (65%, 72% and 83% respectively) than those with a higher turnover of over NGN100m (31%). This indicates that the additional financial expense of consultants poses more of a barrier to organisations with lower turnovers. 52% of organisations with a turnover of over NGN100m rated this EMSIF as 'somewhat important' or 'not important' confirming that the need to use external consultant was less of a barrier for organisations with higher turnovers.

### 5.5.6.5 Organisational ownership structure and EMSIFs

1. Organisation Ownership Structure/Driver (Parent organisation requirement) – This EMSIF was of greater importance to organisations with foreign and mixed ownership, with 59% and 67% of respondents respectively rating it as 'very important' or 'important', and less important to locally owned organisations with 30% of respondents giving the same rating. 58% of locally owned respondents rated this EMSIF as 'somewhat important' or 'not important'.
2. Organisation Ownership Structure/Benefit (Improved environmental efficiency/performance) – The highest 'very important' or 'important' rating for this EMSIF was given by foreign owned respondents (88%). Interestingly, 20% of locally owned respondents were 'not sure' about the importance of this EMSIF indicating an ignorance or lack of awareness of its relevance to their pro-environmental behaviour.
3. Organisation Ownership Structure/Benefit (Improved external/community relations) - This EMSIF was of greater importance to locally owned organisations, with 85% of respondents rating it as 'very important' or 'important', and less important to foreign and mixed ownership organisations with 71% and 71% respectively of respondents giving the same rating. 29% of mixed ownership respondents rated this EMSIF as 'somewhat important' or 'not important'.

### 5.5.6.6 Organisational corporate structure and EMSIFs

1. Organisational Corporate Structure/Barrier (Need to use external consultants) - This EMSIF was of greater importance to sole proprietorships/partnerships, with 67% of respondents rating it as 'very important' or 'important', and less important to organisations with a public and limited liability structure with 50% and 55% respectively of respondents giving the same rating. 50% of organisations with a public structure rated this EMSIF as 'somewhat important' or 'not important'.
2. Organisational Corporate Structure/Driver (Opportunity for new approach in environmental management) - This EMSIF was of greater importance to sole proprietorships/partnerships, with 80% of respondents rating it as 'very important' or 'important', and less important to organisations with a public and limited liability structure with 56% and 62% respectively of respondents giving the same rating.

3. Organisational Corporate Structure/Benefit (Improved employee relations) - This EMSIF was of greater importance to sole proprietorships/partnerships and organisations with a limited liability structure, with 88% and 72% of respondents respectively rating it as 'very important' or 'important', and less important to organisations with a public structure with 59% of respondents giving the same rating.

### 5.5.7 Comparison of EMSIFs from study with EMSIFs from EMS studies conducted in other world regions

It is important to highlight that there are differences in methodology between this study and other EMS studies. While this study presents a specific number of EMSIFs and asks respondents to rate each one, some previous studies take a more investigative approach by attempting to discover what relevant EMSIFs affect organisations, thereby reporting them (Alemagi, 2006; Boiral, 2011). As such, the data sets presented in this study are different from those presented in other studies, restricting the opportunity for parallel comparison.

However, a comparison of results from this and other studies revealed that, whereas other studies in the 'developing country' category had a low study ratio for ENEC EMSIFs, the highest rated EMSIF in this study was an ESI EMSIF (enhanced corporate image). This difference implies that although organisations in developing countries are typically least likely to be influenced by ENEC EMSIFs such as operational efficiency and marketplace advantage as evidenced by other studies, they are in fact influenced by some ENEC EMSIFs like the need to enhance their corporate image.

Furthermore, whereas other studies showed that the 'emerging economy' and 'developed country' categories had the highest study ratios for INEC EMSIFs, this study revealed that organisations in the developing country setting of Nigeria also rated INEC EMIFS (reduced environmental accidents and improved site safety and improved organisational and operational efficiency) very highly. This suggests that the pro-environmental behaviour of organisations in developing countries is also influenced by operating efficiencies, though the exact extent is not known. This presents an opportunity for further research.

## 5.6 Discussion

### 5.6.1 EMSIFs influencing pro-environmental behaviour in organisations

**1. Pro-environmental drivers**

From research survey results obtained on EMSIFs, internal social institutional EMSIFs have the greatest driving influence on the pro-environmental behaviour of respondent organisations, as indicated by the observation that the first 4 of 5 of the top ranked EMS drivers fall into this category i.e. 'environmental concern' (84.2%), 'opportunity to avoid/contain pollution' (84%), 'desire to integrate environmental considerations into corporate strategy' (82.6%) and 'environmental/social responsibility' (82.1%). This demonstrates that organisations possess a considerable degree of internally generated environmental awareness and concern, which in turn drives their pro-environmental behaviour. Internal EMSIFs also appeared to influence respondent organisations to a greater extent than external EMSIFs.

Furthermore, external neoclassical efficient choice drivers like 'customer/client requirements' (68%), 'potential market advantages' (62.2%) and 'pressure from financial institutions' (32.4%) were not rated as highly as internal social institutional drivers by respondent organisations. Empirical literature on EMS drivers reports contrasting results, with studies (Gonzalez-Benito & Gonzalez-Benito, 2008; Heras & Arana, 2010; Zutshi & Sohal; 2004) generally suggesting that EMS motivations are more of an external nature, and fewer studies emphasizing that internal EMS drivers have a greater impact on organisational pro-environmental behaviours (Bansal & Bogner, 2002).

These studies assert that organisations' pro-environmental behaviour is strongly influenced by external factors such as the demands of their respective markets. For instance, studies such as Jiang and Bansal (2003), Tan (2003), Nawrocka and Parker (2008) and Zorpas (2010) conclude that customer demand is globally the most influential driver of pro-environmental behaviour and that the demand of an organisation's market has the most influential impact its environmental decisions. This influence in turn has a strong impact on environmental initiatives adopted by organisations. Pro-environmental behaviours such as formal EMS implementation are therefore of interest to organisations, as means by which they can gain not only environmental 'growth' or performance improvement, but also substantial value in their relevant markets. Organisations are likely therefore to pursue

pro-environmental behaviours such as EMS certification/registration to 'gain competitive advantage' and 'maintain competitive position in their markets'.

These studies present organisations as being primarily motivated by the external forces operating round them. As such, in cases where an organisation's external influencers require (or demand) greater environmental effort, organisations are bound to demonstrate pro-environmental behaviours in an attempt to satisfy this demand. However, it is apparent from results that organisations are also capable of and responsible for generating their own motivations for demonstrating pro-environmental behaviour. Such motivations flow from the desire of organisations to operate as responsible social entities. The influence of social forces on organisations pro-environmental behaviour has previously been discussed by Tomer (1992).

Specifically, external neoclassical efficient choice drivers such as customer requirements and market advantages do not appear to play a major role in motivating pro-environmental behaviour in respondent organisations potentially because, i) Nigerian organisations operate in markets where customers do not associate pro-environmental behaviours with product or service quality, ii) domination in these specific markets can be achieved without overt pro-environmental behaviours iii) respondent organisations generally do not service sensitive international markets, where supplier environmental performance is considered important, and is judged by the display of pro-environmental behaviour, iv) local markets (customers) are not as environmentally sensitive as their developed country counterparts (NCF, 2009; Ogunleye & Alo, 2010; NCR, 2011).

Although responses indicated that a low percentage of organisations were influenced by external social institutional drivers like 'societal/community influences' (43%) and 'other external influences' (46%) including trade associations, lobbyists, consultants, educational institutions, standard industry practices and managerial practices, a high percentage of organisations (81.4%) considered the external social institutional factor, 'regulatory/legal demands/pressures' to exert considerable influence on their pro-environmental behaviour. This result shows that societal factors like the surrounding community do not influence organisations' pro-environmental behaviour as much as regulatory pressures. This is especially true of organisations operating in developing countries, where communities are less educated and therefore less aware of the complex relationship between organisations activities and the natural environment. As such, external societal groups operating around

respondent organisations may not be sufficiently aware of environmental issues to exert substantial influence on organisational pro-environmental behaviour.

Previous research studies (Curkovic et al, 2005; Hoffman, 1997; Matsuzak-Flejsman, 2008; Zorpas 2011) conclude that government-backed regulation is a strong driver of pro-environmental behaviour, and will continue to promote such practices as the adoption of EMSs. In the absence of societal group awareness, regulatory pressures become a particularly influential driver or pro-environmental behaviour for organisations in developing countries. This is particularly because a failure to achieve regulatory compliance ultimately leads to unwanted outcomes like legal sanctions, fines, penalties and loss of operating licenses and permits, and organisations wishing to implement environmental initiatives become immediately aware of the existence of legal requirements, and their responsibility to operate within them.

**2. Pro-environmental benefits**

Of the top five EMSIFs (benefits) rated by respondents, three were internal benefits and two were external. The highest rated benefit was 'enhanced corporate image', rated by 91.9% of respondents as being 'very important' or 'important'. The next three top rated benefits were internally derived - 'reduced environmental accidents and improved site safety' (91.3%), 'improved employee awareness/knowledge of environmental issues (85%) and 'improved organisational and operational efficiency' (83.3%).

A total of 80.8% of respondents rated 'improved external (community) relations' as being a 'very important' or 'important EMS benefit. Conversely only 42.4% of respondents considered 'societal/community pressures/influences as 'very important' or 'important' EMS driver. The low rating of societal/community influences as a driver and high rating of improved community relations as an EMS benefit demonstrates that although Nigerian organisations are not primarily motivated towards pro-environmental behaviour by their external communities, they derive notable community benefits from these actions, indicating that surrounding communities in Nigeria are actually environmentally sensitive to some degree. Previous EMS studies report that implementing pro-environmental behaviour such as EMS adoption has a positive impact on organisations' relationships with surrounding communities, other external stakeholders and regulatory/government bodies. According to these studies, proactive environmental efforts endear organisations to external stakeholders by building trust, deflecting scrutiny and unnecessary interest,

relaxing regulatory controls, and reducing the risk of punitive measures in the event of environmental accidents (Bansal & Bogner, 2002; Matsuzak-Flejsman, 2008).

Results also showed that employee benefits like 'improved employee knowledge and awareness of environmental issues' and 'improved employee relations' were gained as a result of pro-environmental behaviour. Previous studies (Chan & Hawkins, 2010; Gavronski et al, 2008; Jiang & Bansal, 2003; Link & Naveh, 2006; Oliveira et al, 2011; Sambasivan & Fei, 2007; Zorpas, 2010) have reported the positive effect of environmental initiatives on organisation's employees, although this is often difficult to measure. These studies showed that pro-environmental behaviours such as EMS adoption were found to contribute to significant improvement in work environments, resulting in a visible impact on employee relationships.

The fact that external efficient choice benefits relating to an organisation's market such as 'better access to target markets' (57.2%), 'increased market value' (66.4%) and 'better customer loyalty/patronage' (71.7%) were not rated as highly as some internal efficient choice benefits such as 'reduced environmental accidents and improved site safety' demonstrates that respondent organisations did not derive as many market benefits from pro-environmental behaviour as internal efficiencies. The derivation of more internal benefits corresponds with the motivation of organisations toward pro-environmental behaviour by internal drivers. This is evidenced by research results, which indicate that internal drivers tend to produce internally derived benefits with no apparent distinction between the internal quadrants of the FACES model. Consequently, an internal social institutional driver such as 'environmental concern' may produce an internally derived neoclassical efficient choice benefit such as 'reduced environmental accidents and improved site safety'. However, this research has not been designed to determine direct relationships between specific pro-environmental drivers and the benefits, if any, they produce. This link between particular pro-environmental behavioural motivations and specific benefits they produce (or derived environmental performance) has not been extensively studied and presents an opportunity for further research.

Furthermore, respondent organisations, by deriving more internal than external benefits from pro-environmental behaviour demonstrate that organisations in developing countries do not gain as many externally derived market benefits as their developed country counterparts. The reasons for this are diverse. Firstly, the reduced environmental

consciousness or sensitivity of developing country markets leads these to demand lower levels of pro-environmental behaviour from organisations than developed country markets. Secondly, as market pressures on organisations are reduced, so are motivations to demonstrate pro-environmental behaviours specifically intended to operate as passports into specific markets e.g. externally verified/certified EMSs.

The link between market benefits and pro-environmental behaviour in developed country markets has been emphasized in a survey by Massoud et al (2010a), which demonstrated that 46.7% of organisations surveyed believed that their current (poor) environmental performance was possibly a barrier to exporting products to international markets. Approximately 51% believed that displaying pro-environmental behaviour in the form of EMS certification would greatly facilitate the export of their products to these markets. The same study showed that EMS certification standards were useful in overcoming difficult international trade barriers. As such, it was possible for organisations to lose their competitive position in local and international markets by failing to pay sufficient attention to pro-environmental behaviours. This premise has also been supported by other research studies including Oliveira et al (2010) and Quazi et al (2001). Specifically, Bellesi et al (2005) showed that 46% of respondents believed that EMS certifications contributed towards improved competitiveness within their industry sector in their country.

However as most developing country organisations, such as those in Nigeria, do not operate in environmentally sensitive markets, they are less likely to gain (or seek) externally derived market benefits. Consequently, developing country organisations that do display pro-environmental behaviours do so more as a result of internally generated motivations, as is evidenced by respondents EMSIF ratings. Pro-environmental behaviour is therefore exhibited to a greater extent by organisations operating within environmentally sensitive markets (Bansal & Bogner, 2002; Massoud et al, 2008).

Interestingly, the emphasis placed by organisations and markets alike is on the presence of obvious and outward forms of pro-environmental behaviour like EMS certifications, the existence of which can easily be equated with good environmental performance. These organisations are then likely to view environmental performance in the light of their motivations for adopting pro-environmental behaviour. The motivations and benefits of pro-environmental behaviour are so varied and apparently situational that, it may be that the benefits which an organisation derives from implementation are specific to that

organisation. Establishing a link between organisational perceptions of environmental performance and pro-environmental motivations will contribute to furthering the understanding the drivers and results of corporate environmental actions. The next research chapter (Chapter 6) will attempt to establish this link.

### 3. Pro-environmental barriers

The highest rated barriers considered 'very important' or 'important' by respondent organisations were 'cost of implementation/budget barriers' (72.9%), 'regulatory agency bureaucracy' (69.3%), 'lack of resources (69.2%), 'extensive documentation involved' (65.3%) and 'lack of top management commitment' (61.9%).

Studies on EMS barriers report that the cost outlay of pro-environmental behaviours is substantial (Chan & Hawkins, 2010; Curkovic et al, 2005; Jiang & Bansal, 2003; Zorpas, 2010). Organisations in general are cautious about incurring expenses considered not to have a direct link to organisational bottom-line, making them reluctant to expend additional capital on environmental initiatives. Such costs are even more difficult to incur in markets where pro-environmental actions do not bring about immediate and tangible market entry or acceptance.

An obvious barrier to pro-environmental behaviour in respondent organisations (and other organisations in general) is the challenge of dealing with environmental regulatory bodies, which pose additional challenges to organisations in developing countries through excessive bureaucracy. Regulatory bureaucracy is caused by the multiple overlapping functions within different environmental protection bodies leading to overlapping mandates, functions, jurisdictions and permitting systems. For instance, federal and state environmental protection bodies in Nigeria pose these specific problems to the organisations they seek to control. This makes organisations reluctant to approach them, resulting in a negative impact on pro-environmental behaviours (Tomer, 1992). According to Eneh (2011) and Allen (2011), there is a general lack of cooperation between regulatory bodies with environmental enforcement responsibilities in Nigeria, leading to bureaucratic delays. Interestingly, although 'regulatory agency bureaucracy' is rated as an important barrier amongst respondents, 'regulatory/legal pressures' and 'improved relationship with regulators' are also rated as important drivers and benefits respectively. This demonstrates that while organisations acknowledge the challenges in dealing with environmental

regulators, they are aware of the strong pro-environmental motivation posed by regulators, and the inherent regulatory benefits gained from pro-environmental behaviour.

In order to address the 'lack of top management commitment' barrier, it is recommended that research institutions in developing countries (or international developmental institutions funding projects in developing countries) should produce simple publications for top management officials of organisations, detailing sample costs vs. benefits of different pro-environmental behaviour initiatives such as EMS implementation.

### 5.6.2 Organisational characteristics and trends in pro-environmental behaviour

An organisation's pro-environmental behaviour is affected by such characteristics as its size, the existence of multinational operations or foreign ownership, active top management pressure, previous experience in displaying pro-environmental behaviours and existence of a quality system certification (Bellesi et al, 2005; Cashore et al, 2005; Curkovic et al, 2005; Delmas, 2002; Nishitani, 2009; Tan, 2003). This research investigated the impact of organisational characteristics (size, industry sector, turnover, geographical/geopolitical location, ownership structure and corporate structure) on respondent organisations' pro-environmental behaviour, by determining the existence of significant relationships between organisational characteristics and respondents rating of EMSIFs.

**1. INEC EMSIFs and organisational characteristics**

From examination of significant relationships, it is apparent that an organisation's physical location affects internal neoclassical efficient choice factors operating within it. Organisations in specific geographical zones (Lagos, South South and North Central) had higher percentage ratings for 'greater economic returns/cost savings' than those in other zones. This may be because these zones are significantly more economically vibrant than others in Nigeria, making organisations operating within them place a greater emphasis on profitability.

The industry sector in which an organisation operates has an impact on its pro-environmental behaviour, and affects EMSIFs like 'economic returns/cost savings' and

‘organisational and operational efficiency’. Organisations in the construction, manufacturing, consultancy/service provision, telecommunications, government/parastatal and oil/gas industry sectors rated these INEC EMSIFs significantly higher than those in the aviation and financial services sectors. Organisations in highly specialized and technical industries like the aviation sector have independent industry standards for operational efficiencies within which they must operate, and are subsequently not primarily motivated towards operational efficiencies by environmental factors. Financial services organisations, as a result of the indirect impact of their operations on the environment, tend to assume that their impacts are minimal and are less environmentally proactive as a result.

An organisation’s size, turnover and corporate structure also have an impact on INEC EMSIFs affecting it. Specifically, these characteristics affected how important organisations rated ‘the need to use external consultants’. INEC factors are related to organisations internal profitability and efficiency, making smaller organisations with a lower turnover and less complicated corporate structure less likely to expend large sums on additional costs considered not directly linked to performance (such as external environmental consultants).

In general, 56% of respondents considered the INEC EMSIF ‘past success with quality-based certification’ to be ‘very important’ or ‘important’. This demonstrates that the existence of quality management certifications like ISO 9000 gives organisations the confidence to proceed towards adopting pro-environmental behaviour, especially in the form of EMSs.

**2. ENEC EMSIFs and organisational characteristics**

Significant relationships between organisational characteristics and ENEC EMSIFs reveal that an organisation’s geographical location, the industry sector in which it operates and its size affect how that organisation interacts with its customers and within its market. Results from organisations in the more economically vibrant zones of Lagos, North Central and South South had higher percentage ratings showed a strong association between ‘customer/client requirements and ‘better customer loyalty/patronage’ than other geographical zones. Furthermore, organisations in the South East and Lagos zones, which are densely populated trading locations had higher percentage ratings for the EMSIFs ‘better access to target markets’ and ‘better access to insurance’. This result reveals that

organisations are sensitive to their surrounding external market conditions, and will place greater importance on external factors affecting their pro-environmental behaviour.

All (100%) of organisations in the aviation industry sector rated the ENEC EMSIF 'better customer loyalty/patronage' as being important to their pro-environmental behaviour. Organisations in this sector are largely dependent on maintaining good relationships with customers, while ensuring that customer satisfaction levels are high. Problems with customers could be catastrophic for these organisations, causing them to value and respond readily to customer opinion. This also explains why the ENEC EMSIF 'better access to target markets' was rated highly by the aviation industry. These ENEC EMSIFs were also rated highly by organisations in the construction, consultancy/service provision, telecommunications, engineering and oil/gas industries. These EMSIFs were not considered important by most respondents in the government/parastatal sector, most of which are not as customer focused in their approaches.

The ENEC EMSIF 'parent organisation requirement' is largely dependent on an organisations ownership structure, as foreign owned organisations with advanced environmental cultures are more likely to influence their subsidiaries to emulate this practice than their locally owned counterparts.

### 3. ISI EMSIFs and organisational characteristics

Results revealed several significant relationships between organisational characteristics and internal social institutional EMSIFs. An organisation's geographical location affects ISI EMSIFs such as 'employee resistance/lack of awareness', 'lack of concern about environmental issues' and 'lack of conviction about environmental benefits'. Organisations in the North Central and North East zones rated these EMSIFs highly, indicating that these were barriers to their pro-environmental behaviour. The extent to which internal stakeholders are aware of and enthusiastic about environmental initiatives significantly affects the pro-environmental behaviours an organisation adopts, as employees are an important element in the implementation of environmental initiatives.

The ISI EMSIFs 'organisational and operational efficiency' and 'environmental efficiency/performance' were affected by industry sector and organisational ownership structure. Although other industry sectors rated 'organisational and operational efficiency' as an important EMSIF affecting their pro-environmental behaviour, the aviation and

telecommunications sectors did not rate this EMSIF highly. Again, this is likely to be because these specialized sectors operate according to mandatory independent industry standards which must be adhered to and which are irrespective of particular organisations stances' on environmental issues. Foreign owned organisations rated 'environmental efficiency/performance' higher than locally owned organisations, probably because they operated at higher environmental levels in their home countries. This would cause the parent organisation to require the subsidiary to demonstrate minimum pro-environmental behaviours.

Interestingly, the ISI EMSIFs 'opportunity for new approach in environmental management' and 'opportunity to contain pollution' were rated as more important by smaller organisations and those with a sole/partnership structure than by larger organisations with a limited or public corporate structure. Determining the impact of an organisation's size and corporate structure on its pro-environmental behaviour presents an opportunity for future research.

### 4. ESI EMSIFs and organisational characteristics

ESI EMSIFs like 'societal/community influences/pressures', and 'improved external/community relations' were affected by geographical location and organisational ownership structure, with organisations in the South South zone rating these EMSIFs highest. This zone represents the most economically profitable and environmentally sensitive region in Nigeria, and surrounding communities have placed immense pressure on operating organisations to address environmental challenges which have been caused as a result of oil prospecting and production in this area. Results also reveal that locally owned organisations rated the ESI EMSIF 'improved external/community relations' higher than foreign owned organisations.

## 5.7 Research limitations, gaps and future research opportunities

Resource constraints and the high cost of cross-country travel for direct administration of questionnaires restricted the size of the sample population. Furthermore, the number of organisations analysed during this study was restricted to those organisations showing a willingness to respond to the survey. Nigerian organisations show a notable reluctance to respond to research surveys of this nature, and though a relatively large number of

questionnaires were distributed, only 200 responses were obtained. An important limitation is also a potential self-reporting bias as a result of respondents' individual influences on responses. As research data used in this study was self-reported, the accuracy of data could not be verified. This limitation has been identified by Boiral and Roy (2007) and Heras et al (2011). This quantitative study was based on the perceptions of respondent organisations' staff on EMS implementation aspects. Although data obtained from qualitative studies based on perception measures satisfies validity and reliability requirements, there may be an interpretive bias in respondent's responses to questions on motivations (drivers) and outcomes (benefits) of EMS implementation aspects. As identified in Heras et al, (2011), when questioned on EMS drivers and benefits, as is done in this study, respondents' views of drivers and benefits may suffer an interpretive problem, as EMS benefits may also be perceived as EMS drivers.

As highlighted by Christmann and Taylor (2006), conducting this research within the context of a single country provides the opportunity of having a constant environment, but may weaken the generalizability of findings.

A number of opportunities exist for future research into EMS implementation aspects, both in Nigeria and other developing countries. Future opportunities exist for conducting research focusing on; investigating trends or causal relationships between different organisational characteristics (such as size, industry sector, geographical location, turnover, ownership structure and corporate structure) in developing countries and how EMSIFs are perceived; investigating trends or causal relationships between organisational characteristics and organisations' level of environmental management in developing countries, and; comparing how organisations rate 'non-EMS' benefits (e.g. better customer loyalty) derived from EMS implementation against EMS benefits (e.g. reduced environmental incidents).

Furthermore, to encourage organisations towards compliance with regulations, environmental regulatory bodies operating in developing countries (such as those mentioned in this research) should compile, publish and distribute documents detailing the drivers, benefits and barriers to pro-environmental behaviour in organisations. The contents of this thesis would be an important input into proposed publication material.

## 5.8 Summary

In seeking to achieve the objectives of this chapter, the FACES model was used to analyse EMSIFs identified by respondent (Nigerian) organisations. Survey results revealed that respondent organisations were more motivated towards pro-environmental behaviour by internal (neoclassical efficient choice and social institutional) EMSIFs than by external EMSIFs. Respondent organisations also derived fewer market benefits from pro-environmental behaviour than their developed country counterparts, potentially because of a reduced environmental consciousness or sensitivity. Similar to organisations in developed and emerging economies, respondent organisations were hindered from exhibiting pro-environmental behaviour by INEC barriers such as the cost of EMS implementation, budget barriers, a lack of resources and the extensive documentation involved. Results revealed that regulatory agency bureaucracy, regulatory pressures and improved relationships with regulators were strong EMSIFs influencing pro-environmental behaviour.

Results also revealed that the organisational characteristics of geographical location, industry sector, size, turnover, ownership structure and corporate structure affected respondent organisations ratings of EMSIFs which affected their pro-environmental behaviour. Respondent (Nigerian) organisations' ratings of EMSIFs and the relationships between organisational characteristics and EMSIFs are an important indicator of pro-environmental behavioural trends of organisations in other world regions, especially those operating in less developed areas. Survey results raise important issues about the fundamental purpose of pro-environmental behaviour – which is the improvement of organisational environmental performance.

The existence of varying drivers, benefits and barriers to pro-environmental behaviours may impact the results that individual organisations intend to, and eventually achieve as a result of environmental actions. This also raises the following issues for consideration within this research – if organisations adopt or display pro-environmental behaviours to improve environmental performance, what do they consider environmental performance itself to be and what do they expect to achieve by their actions? Furthermore, how can performance be measured to demonstrate improvement, and what objective means may be used to determine the impact of pro-environmental behaviours on organisational environmental performance?

# CHAPTER SIX

# ORGANISATIONAL PERCEPTIONS OF ENVIRONMENTAL PERFORMANCE

## Structure of Chapter Six

## 6.1 Introduction

Chapter 5 of this thesis reports that the pro-environmental behaviours of organisations are affected by EMSIFs which drive, impede or provide benefits for these organisations. Research results presented in chapters four and five raise an important question about the overall aim of pro-environmental behaviour – what is pro-environmental behaviour by organisations intended to achieve?

Generally, organisations exhibit pro-environmental behaviours in an attempt to improve their environmental performance, and are affected by different drivers, benefits and barriers (EMSIFs) in this process. However, environmental performance is complex and multidimensional (Hertin et al., 2008), and because organisations have differing operations with different interactions with the environment, formal definitions are difficult to generalize. This creates subjectivity in the interpretation of environmental performance (Bellesi et al., 2005; Hertin et al., 2008). Furthermore, the difference in the relative rating of EMSIFs by organisations in different world regions (as reported in Chapter 5) indicates that organisations rate pro-environmental behaviour differently and seek environmental performance for different reasons. Subsequently, organisations are likely to have varying views of the meaning and understanding of environmental performance, and will approach performance improvement in different ways and seek it for different reasons.

Research on the relationship between pro-environmental behaviours and environmental performance has been inconclusive, with previous research revealing that there are variations in the meaning and interpretation of environmental performance (Bellesi et al., 2005; Perotto et al., 2007; Darnall et al., 2008; Hertin et al., 2008; Massoud et al., 2010). Understanding differing organisational interpretations of environmental performance will help to correctly ascertain the impact that pro-environmental behaviours are intended to have on organisations. It will also create the clarity required to address the issue of the means and methods by which environmental performance measurement should be approached. This chapter aims to identify organisations' views of environmental performance by ascertaining what respondent organisations (Nigeria in context) viewed it to mean.

## 6.2 Research objective

The objective of this chapter is to identify organisational views on environmental performance and critically analyse perceptions of environmental performance in a developing country context.

## 6.3 Review of literature

### 6.3.1 Environmental performance

A basic definition of environmental performance is that it is 'the measurable result of an organisation's management of its environmental aspects' (ISO, 2004). More detailed definitions given by Reis (1995) and Tibor and Feldman (1996) generally explain environmental performance as being the intended results organisations expect to achieve from undertaking a period in which they attempt to gain an understanding of the aspects of their activities, products and services that may pose significant environmental risk and impacts.

In the past two decades, the concept of environmental performance has attracted interest from organisations worldwide including industry, multinational companies and governments, and resulted in the increased popularity of pro-environmental behaviours such as the implementation of externally audited EMSs and the adoption of external certification standards (Corbett & Kirsch, 2001; Massoud et al., 2010b; Sambasivan & Fei, 2008). As environmental performance is a complex issue, different organisations, by viewing environmental performance in different ways, may have varying ways by which performance improvement is brought about.

There are a number of ways in which an organisation may view environmental performance, and its perception appears to be largely driven by pro-environmental motivations. These motivations may be environmental or non-environmental in nature, making the perception of environmental performance inherently environmental or non-environmental. Furthermore, environmental improvement can refer to the internal (operational performance e.g. lower emissions, reduced material consumption) or external environment (improved state of the environment e.g. better air quality or resource conservation) of an organisation. Organisations that are driven towards pro-environmental

behaviour to achieve multiple benefits view environmental performance in light of the attainment of such benefits. However, the interpretation of environmental performance in the light of purely environmental factors may be hindered by the fact that it has been difficult to show causality between pro-environmental behaviour and environmental improvement. Some studies have found that pro-environmental behaviour brings about positive impacts, such as reducing environmental accidents (Montabon et al., 2007). However, the evidence of a consistently positive relationship between improved environmental performance and corporate performance (as evidenced by cost savings, market position etc.) has not been strong (Curkovic et al., 2005), and relationships between pro-environmental behaviours and tangible environmental improvement have been difficult to prove (Gomez and Rodriguez, 2011).

Environmental performance may also be viewed from a non-environmental standpoint. In a survey of Swiss firms by Hamschmidt (2000) seeking to identify EMS benefits considered to be the highest priority by respondents, only three of the benefits highlighted ('risk minimization', ‘certainty of legal compliance' and ‘support of ecological transformation of the line of business’) had a direct link with environmental management. Other benefits were non-environmental. Organisations, in practice, may not consider environmental performance as defined by purely environmental factors such as EMS implementation or management. They may instead consider performance against the background of other organisation-specific or performance elements related to their reasons for demonstrating pro-environmental behaviour in the first place. The demonstration of pro-environmental behaviours (especially behaviours that involve long-term resource investments) leads to the interpretation of results according to driving pressures (Nawrocka and Parker, 2008). This leads organisations to link the results of pro-environmental behaviour (performance) with the drivers that led them to display it.

For instance, organisations driven largely by efficiencies and profitability are likely to view environmental performance as an improvement in efficiencies. Studies have confirmed that high levels of pro-environmental behaviour are associated with enhanced productivity and business performance, quality improvement, cost reduction, product innovation new product development and industry growth (Quazi et al 2001; Link & Naveh 2006; Montalbon et al., 2007). Environmental performance improvement is therefore viewed directly in the light of the attainment of these results.

Organisations led to display pro-environmental behaviours primarily by specific drivers e.g. regulatory pressures will directly associate (and interpret) environmental performance with an improvement in regulatory compliance with regulations and better relationships with regulators. Such organisations view environmental performance as having a positive effect on regulatory compliance and the subsequent avoidance of legal sanctions, fines, permit losses and penalties (Hoffman, 1997), which impact on business performance.

Organisations which face predominant market pressures or serve environmentally conscious customers are similarly likely to interpret their attempts at pro-environmental behaviour and expected environmental performance in the light of market performance (Darnall et al., 2008). Jiang and Bansal (2003) have reported that market pressures were the most influential factor driving organisations towards pro-environmental behaviour, with market demand placing strong and direct pressures on organisations. Such organisations are more likely to view environmental performance in the light of increased moral legitimacy within markets, improved customer acceptance and perception and greater market share. Organisations facing pressures from their social stakeholders – community groups, labor unions, employees, trade unions and shareholders – likewise view environmental performance in the light of social legitimacy. Social actors, now empowered by an increased availability of environmental information, can have substantial impact on the way an organisation is viewed by mobilizing public sentiment, altering established norms and changing perceptions (Hoffman, 2000).

In an attempt to avoid the consequences of negative societal publicity in the form of protests, boycotts and civil actions, and to address societal concern for employees and community members, organisations adopt pro-environmental behaviours. In turn, they expect environmental efforts to yield direct social gains such as improved corporate reputations. Such organisations are likely to view these social gains as direct measures of improved environmental performance.

A challenge in the interpretation of environmental performance and management is that it is dependent on organisation-specific elements such as size, location and nature of organisational processes, making it difficult to achieve uniformity in the assessment of performance, or to set uniformly recognized boundaries against which environmental performance may be considered within an organisation’s operations (Brouwer & van Koppen, 2008; Hertin et al., 2008). Due to differences and inconsistencies in its

interpretation, organisations are more likely to define environmental performance differently and its determination becomes subject to how it is defined by each individual organisation. There is no universally accepted approach to the task of weighing different environmental impacts against each other. Objective methods exist for the quantification and measurement of performance improvement through the use of indicators and benchmarking techniques, However, different organisations carry out their operations under varying economic, technological and regulatory conditions, making it difficult to eliminate subjectivity and adopt a universally accepted approach to the task of assessing and comparing different environmental impacts which determine environmental performance (Hertin et al., 2008).

Environmental performance is also particularly difficult to define because there has been a lack of agreement in studies attempting to identify relationships between pro-environmental behaviours like EMS implementation and environmental performance. These studies are few and relatively difficult to find, and they have failed to clarify the reasons and methods by which pro-environmental behaviours like EMSs improve environmental performance (Webb et al., 2006; Nawrocka & Parker, 2008; Gomez & Rodriguez, 2011).

### 6.3.2 Pro-environmental behaviour and environmental performance: ISO 14001 in focus

A demonstrable form of pro-environmental behaviour in an organisation is the implementation of an EMS. In order to ensure it is achieving targets for attaining improved environmental performance, an organisation with an EMS should periodically assess its performance against system criteria such as its environmental policy, objectives and targets (ISO, 2014; Perotto et al., 2006).

The formal EMS certification standard ISO 14001:2004 is targeted at addressing and eliciting a progressive spiral of improved organisational performance, and promotes the adoption of a systems approach to environmental issues and innovative technological and process control options. This is achieved by (i) the institution of a number of systemic internal processes encompassing the allocation of resources and responsibilities for specific environmental duties, (ii) employee training and participation and, (iii)

documenting and regularly auditing EMS-related activities to maintain standards and identify opportunities for improvement (Bansal & Bogner, 2002; Cashore et al., 2005; Curkovic & Sroufe, 2011; Nishitani, 2011; Quazi et al., 2001). The general belief is that, if functional, operational and efficient systems are in place to manage environmental interactions, a cycle of improved environmental performance will be triggered and maintained.

However, though there is some focus on environmental performance improvement, EMS standards such as ISO 14001 were not designed to operate as performance standards. ISO 14001 is rather described as a procedural management tool, which does not specify any optimum levels of performance improvement but instead focuses on the implementation of processes and procedures that should have a beneficial effect on an organisation's management of its interactions with the environment. In fact, the standard only requires the commitment to environmental legal compliance with applicable regulations as a minimum requirement (Bellesi et al 2005; Comoglio & Botta, 2011; Curkovic et al 2005; Melnyk et al., 2003).

It appears that emphasis is not on the actual achievement of better environmental performance but on the presence of structures able to bring this about. This situation may have a negative impact on operational environmental performance, especially in organisations driven to display this form of pro-environmental behaviour solely as a result of market or social pressures. It also confuses the interpretation and understanding of environmental performance because organisations may be led to think that the existence of an EMS denotes improved environmental performance. Furthermore, it raises the issue of whether organisations should be left to pursue environmental performance improvement as solely determined by what they consider their main pro-environmental drivers to be. Within the EMS standard ISO 14001, the means and procedures by which environmental impacts are identified and managed are emphasized rather than measures of such impacts, and organisations are simply required to determine '…. the criteria against which they will evaluate environmental performance, using appropriate indicators' (ISO, 2014).

As the standard does not provide an explicit means by which environmental performance or continual improvement may be measured, the issue of measuring environmental performance is laid open to much subjectivity and ambiguity (Casadesus et al., 2008;

Comoglio & Botta, 2011). The perception and understanding of environmental performance interpretation is then a function of the EMS implementer.

The annex to the draft ISO 14001:2014 does provide some additional information on how environmental performance measurement should be approached. The ISO 14031:2013 standard also provides operational methods by which environmental performance may be assessed, and is concerned with methods and approaches for the quantification of environmental information towards environmental performance evaluation. However, exposure to the ISO 14031:2013 document and its use is limited amongst certified companies (as is evidenced by Chapter 5 results). To bridge the gap, performance management elements including requirements for definition, measurement and monitoring have been included in the draft ISO 14001 standard to facilitate the ability of organisations to monitor performance and achieve continual improvement. However, still widely acknowledged is the standard's distant connection with performance levels, and that this lack of emphasis and specificity on performance creates ambiguity and leaves the decision as to the extent of environmental performance management to the organisation's discretion (Brouwer & van Koppen, 2008; Yin & Schmeidler, 2009; Curkovic & Sroufe, 2011). Indeed it is unlikely that a standard attempting to be relevant to all organisational types can (or should) provide more than a perfunctory guidance on environmental performance. Rather, such a widely applicable standard should only provide sufficient direction to enable organisations to identify specifically applicable performance management aspects.

Although potential benefits of ISO 14001 adoption are recognized, the exact mechanism by which environmental performance improvement is brought about remains unclear. Practitioners and academics seek a better understanding of different organisational aspects that promote the achievement of benefits from pro-environmental behaviour through EMS implementation (Lopez-Fernandez & Serrano-Bedia, 2006). This continued knowledge gap supports the argument that pro-environmental behaviour, in the form of EMS implementation, does not bring about performance improvement, and creates ambiguity as to what environmental performance should be. Organisations are likely to continue having wide ranging ideas as to what environmental performance is, and subsequently pursue its achievement in varying ways. However, little if any research has been conducted to confirm that organisations maintain differing views of environmental performance. Little has also been done to identify and analyse these views as a means of evolving more

accurate and appropriate ways in which environmental performance measurement may be carried out.

## 6.4 Methods used

Chapter 3 contains a full description of the main methods used in this research chapter and these are summarized here.

### 6.4.1 Qualitative data analysis

Qualitative data on organisations' opinion of the meaning of environmental performance was collated and analysed. Responses to the question 'What does environmental performance mean to your organisation?' were treated as empirical information from which inferences were made based on reasoning and simplification of the complexity of responses (Neuman, 2006). Qualitative responses were collected through an open-ended question included in the questionnaire. As the open-ended question was added to the questionnaire after some responses had been retrieved, existing respondents were followed up to answer the question via telephone. This was done to ensure consistency in the methodological approach. A total of 57 responses to the open-ended question were collected.

### 6.4.2 Quantitative analysis of qualitative data

Respondents' responses to the question 'what does environmental performance mean to your organisation?' were analysed quantitatively by dividing responses into sub themes and identifying the number of sub themes present in each response. The recurring presence of sub themes was then totaled and presented in graphical form.

### 6.4.3 Conceptualization, coding and analysis of qualitative data

Conceptualization involves the development of themes, concepts or topics upon which qualitative data analysis is based. The formation of concepts about data collected in this research chapter was used as a way of synthesizing and making sense of data. There is much debate and lack of agreement about the primary approach which should be adopted in qualitative data analysis, with some researchers suggesting that analysis should begin

with a list of concepts, and others preferring that researchers determine inherent concepts from the data itself. A deductive approach was taken in analyzing data, with the use of an existing theoretical proposition to design a framework for analyzing data (Saunders, Lewis and Thornhill, 2012). The FACES model developed in Chapter 4 of this thesis was used as a basis for discussing and analyzing qualitative data, and themes were extracted from EMSIFs arranged within this model. The model with its four quadrants encompasses influencing factors which drive and impede organisations pro-environmental behaviour, from which related themes and concepts about organisations' interpretation of environmental performance can be drawn.

Coding involves the categorisation of raw data into related codes. Miles and Huberman (1994) warn that the stage at which codes are developed is less important than the necessity for codes to follow a structural, conceptual order and to relate to one another in a coherent manner. Codes should typically have five parts – a short name, a definition, a description of how to recognize the code within data, referred to as a 'flag', exclusion or qualification criteria and an example (Neuman, 2006).

Figure 6.1 shows themes derived from EMSIFs and set within the FACES model. EMSIFs have been grouped into common themes within each FACES quadrant, with appropriate tiles allocated. Table 6.1 gives a detailed description of codes used to analyse data. Each code is provided with a definition, a flag (or description within the data), exclusion or qualification criteria and an example in order to aid the allocation of qualitative data to codes.

## 6.5 Findings and discussion

Figure 6.2 shows how answers to the question 'what does environmental performance mean to your organisation?' related to the subject themes obtained from the FACES model. From analysis of respondent opinions, organisational perceptions of environmental performance are interpreted more in the light of 'environmental impact consciousness' (improvement, potential or otherwise in environmental management aspects) and 'environmental efficiencies' (interpretations in light of pro-environmentalism or environmental friendliness), than 'organisations markets' (the market in which the organisation operates or plans to expand in, including its products, services, suppliers and

customers), 'organisational efficiencies' (related to organisational operational activities and internal efficiencies) or 'employee awareness and commitment' (responses involving employee input, commitment or resistance). Results also show that organisations views on environmental performance are associated with 'social pressures and influences' (influences arising from social groups in the organisation's external environment, including other organisations), and 'regulation' (regulatory and legal pressures, desires to comply and failure to comply).

Respondents' views revealed two additional subject themes associated with environmental performance. These were 'standard/industry best practices' and 'existence of documentation and other management system elements'. No organisational responses were associated with 'organisational resources' or 'management commitment'.

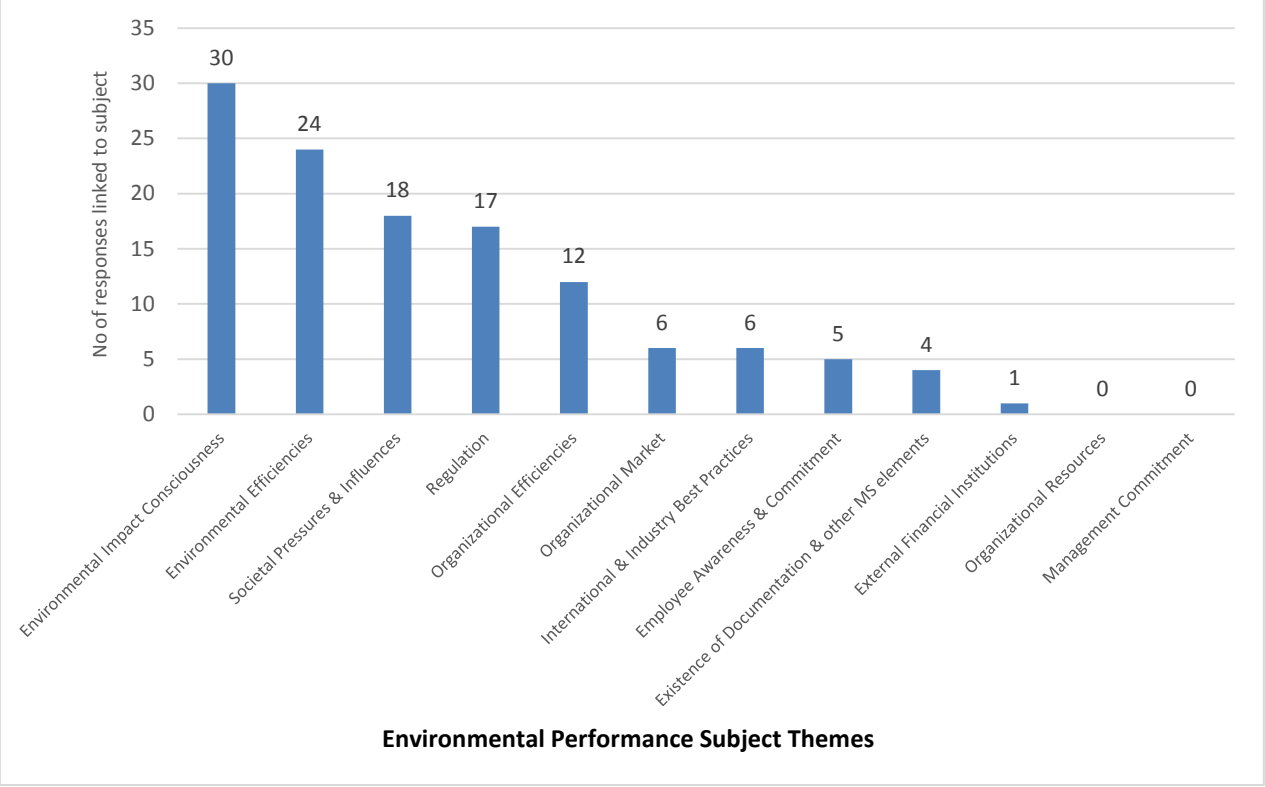



*Figure 6.2 – Respondents views on environmental performance*

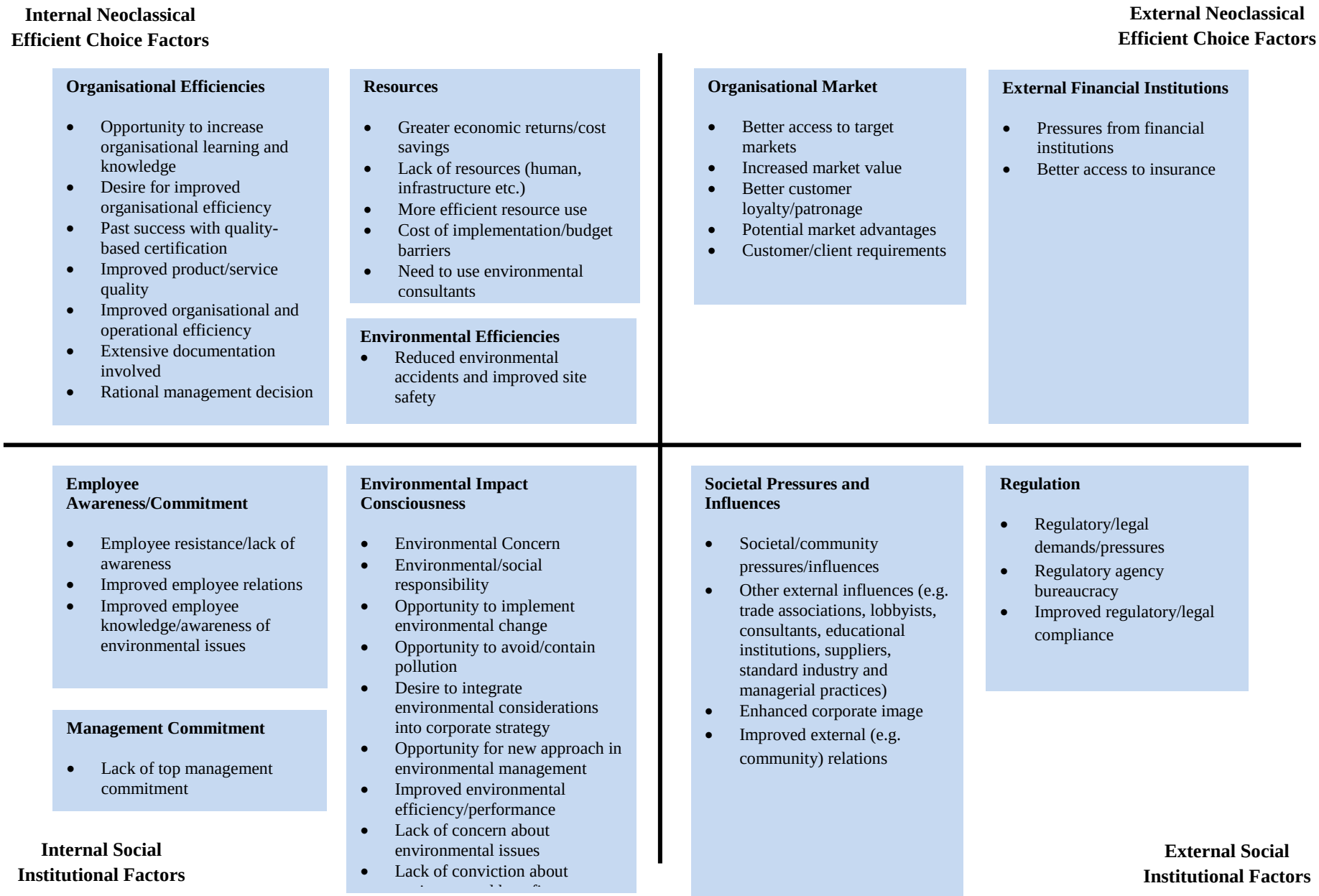



*Figure 6.1 – Qualitative analysis themes within the FACES model*

*Table 6.1 – Detailed description of qualitative analysis codes*

| **Code Components** | **Internal Neoclassical Efficient Choice Factors** | | | **External Neoclassical Efficient Choice Factors** | | **Internal Social Institutional Factors** | | | **External Social Institutional Factors** | | **Other** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label/Name** | **Organisational Efficiencies** | **Organisational Resources** | **Environmental Efficiencies** | **Organisational Market** | **External Financial Institutions** | **Employee Awareness & Commitment** | **Management Commitment** | **Environmental Impact Consciousness** | **Societal Pressures & Influences** | **Regulation** | **Other** |
| **Definition** | Related to organisational operational activities and internal efficiencies | Having to do with organisational resources including, economic and human resources | Improvement, potential or otherwise in environmental management aspects | The market in which the organisation operates or plans to expand in including its products, services, suppliers and customers | Evidence of influence from financial institutions operating in the organisation's external environmental | Responses involving employee input, commitment or resistance | Management intentions towards environmental effort | Interpretations in the light of pro-environmentalism or environmental friendliness | Influences arising from social groups in the organisation's external environment, including other organisations | Regulatory and legal pressures, desires to comply and failure to comply | Any theme not under the given themes |
| **Flag/ Description** | References to organisational processes, procedures or management systems | References to money, finances, employees or similar resources | References to environmental processes and benefits gained or targeted | References to the customer, customer requirements, business or the market | References to financial institutions or authorities | References to employees | Direct references to management, supervisory staff and superiors. | References indicating environmental concern, stewardship or the need to manage environmental aspects | References to local communities, labor/interest groups, trade associations | References to legislation, laws or regulatory authorities | Any reference to other themes or subjects |
| **Exclusions /Qualifications** | None specific | Excludes references to natural resources | None specific | None specific | None specific | None specific | None specific | None specific | None specific | None specific | None specific |
| **Example** | 'Waste generation has been minimized' | 'We are short-staffed in the environment department' | 'Our waste water treatment process is now more efficient' | 'It's what our customers expect' | 'Our insurance premiums went up last year' | 'Employees are happier with the organisation | 'Management doesn't care about the environment' | 'We believe that protecting the environment is important' | 'The local community are pleased with our organisation' | 'We need to ensure compliance' | |

Interestingly, 'environmental impact consciousness' emerged as the most popular subject theme around which respondents' views on environmental performance were centered. When asked, respondents equated environmental performance with environmental impact by giving such responses as '… how we impact the environment….', '……minimizing environmental risk to a barest minimum….', '….minimizing discharges….', '….trying to prevent harm to the environment…', '…..preventing air pollution….', '……reducing certain levels of environmental aspects….', '….trying to leave as little as possible of our carbon footprint…..', '…..carrying out operations without negative impact on the environment….' and '…..making sure that the environment is not degraded or polluted in any way…'.

Organisations also viewed environmental performance in the light of 'environmental efficiencies'. In responding to this question, specific reference was made by several respondents to environmental efficiencies, including '….we have a waste management plant where we compact our waste and use it for compost or fertilizer….', '….we want to reduce …. paper consumption and water consumption…', '….our aircraft use fuel efficient engines…', '….we have spent over 16 million Naira to upgrade our effluent treatment plant…..', '…..we are looking at options of using LED light to replace normal light bulbs…', '….reducing noise levels by using our new generation aircraft…' and '…wastes generated are collected, treated …. in an environmentally friendly manner'. Responses indicate that these organisations view environmental performance as being the degree to which they are able to efficiently use environmental resources while operating processes which minimize their negative impact.

Environmental performance is also viewed in the light of 'societal pressures and influences', with organisations making references to issues such as '….the corporate image of my organisation…', '….our level of social responsibility….', '….host communities where we work…', '….not hazardous…… to human beings around…', '….the company reputation …..', '….our name is our reputation….', '…… the health of the people living around….' and '…. guarantee that people in our immediate area are taken care of….'. Environmental performance, to these organisations is seen in relation to the impact that they have on surrounding stakeholders, judged by the impression which these stakeholders have of the organisation.

‘Regulation’ impacts the way environmental performance is viewed. Organisations made specific references such as ‘……it enables us to stay out of litigation….’, ‘….benchmarking all activities to environmental compliance….’, ‘….comply with all applicable …….regulations…..’, ‘……the associated penalties or fines paid….’, ‘…. The State government is all over the place….’, ‘….according to the standard speculated in the law….’ and ‘……we must meet the parameters of the regulatory authorities….’. To these organisations, environmental performance is synonymous with the extent to which they demonstrate compliance with environmental regulation.

Results show that organisations views of environmental performance are influenced by organisational realities and motivations. Organisations operating in the oil and gas industry tended to include statements relating to regulators, laws and compliance, indicating that they viewed environmental performance in light of regulatory compliance. External social pressures, such as those from regulators are likely to impact organisations operating in highly regulated industries (Tomer, 1992). These pressures are also likely to shape such organisations perception of environment performance. From respondents’ responses, these organisations showed an awareness and concern for environmental impacts, but they were also markedly aware of the regulatory pressures on them to operate within set laws. A number of respondents in this industry referred to ‘social responsibility’, ‘stakeholders’, ‘host communities’ and ‘people around’ indicating their sensitivity to and knowledge of the importance of corporate reputation. In pursuit of what they consider to be improved environmental performance, such organisations are likely to include elements like community relations and social responsibility projects and proactive interfaces with regulators as part of environmental efforts. For these organisations, achieving improved host community and regulator relationships is equated with improved environmental performance.

Organisations operating in the manufacturing industry made statements referring to operations, environmental efficiencies and parameters such as water consumption, waste treatment and management, air quality and noise quality. These organisations were aware of a need to be efficient in the use of resources and appeared to view environmental performance as an extension of this efficiency. Operational efficiencies are of importance in manufacturing organisations, and they are more likely to view environmental performance as an operational

necessity and a competitive priority (Gonzalez-Benito & Gonzalez-Benito, 2008; Massoud et al., 2010; Jabbour et al., 2011)

Organisations which provided services to other organisations e.g. oil and gas upstream, telecommunications and engineering service providers tended to include remarks relating to clients, standards, best practices and the presence of an EMS or environmental documentation. Environmental performance for these organisations was viewed as the extent to which they met customer and market requirements/expectations for doing business. This usually relates to the existence of tangible and presentable icons of 'performance' such as EMS documentation, compliance certificates and externally recognized certifications. For such organisations, the market in which they operate places substantial pressure on their decision to demonstrate environmental behaviour (Curkovic et al., 2005; Darnall et al., 2008; Nawrocka & Parker, 2008). These market drivers are also likely to impact the expected results of pro-environmental behaviour and organisations are likely to expect results which are clearly visible to their customers (Mohammed, 2001; Nishitani, 2009; Jabbour et al., 2011).

ISO 14001:2004 defines environmental performance as 'the measurable result of an organisation's management of its environmental aspects', also equating the concept with environmental impact (ISO, 2004). However, though the ISO standard defines environmental performance in terms of measurement, few respondents made reference to measurement in sharing their views. Though standards like ISO 14001 are criticized for not having a strong enough reference to environmental performance (Bansal & Bogner, 2002; Link & Naveh, 2006), the only way that a concept so subject to individual interpretation can be managed is through the definition of broadly applicable means of assessment. This has been done by the ISO 14001 standard through the use of the word 'measurable' in the definition of environmental performance and through the requirement for measurement in the assessment of environmental performance. Organisations should therefore clearly establish what they consider environmental performance to be and should set targets against which measurements can be taken, in order to properly determine performance improvement.

## 6.6 Research limitations, gaps and future research opportunities

The small sample size of organisations from which responses on the environmental performance definition was collected presented a limitation, as a larger sample size may have produced more generalizable results. Budget constraints made it impossible for more organisations to be included in the study.

Further research should be conducted on determining suitable means by which different organisations may identify environmental performance measurement approaches which are best suited to their specific realities, operations and pro-environmental behaviour motivations.

## 6.7 Summary

Environmental performance is interpreted in different ways by organisations, and is viewed in light of each organisation's realities and motivations. Subsequently, when an organisation achieves the environmental performance it set out to attain, it can be said to have achieved improvement.

Environmental performance in all its forms should be measurable. However, though environmental performance is viewed in differing ways by organisations, a constant set of indicators is usually employed in an attempt to measure performance. This results in a variance between what is being measured and intended outcomes. For instance, an organisation that is primarily motivated by societal pressures and influences and which views environmental performance in this light is not likely to derive value from simply measuring set operational performance indicators such as water utilization or recycling levels. It would be useful to determine methods/means of measuring the main subject themes around which environmental performance is viewed, as reported by this research. Chapter 7 will attempt to identify and report on the environmental performance indicators currently measured by organisations, identify gaps between the current measurement of performance indicators and organisations views of environmental performance, and suggest more appropriate means by which the measurement of environmental performance should be done.

# CHAPTER SEVEN

# THE SUITABILITY OF INDICATORS FOR MEASURING ENVIRONMENTAL PERFORMANCE

## Structure of Chapter Seven

## 7.1 Introduction

Research results reported from Chapter 6 of this thesis have shown that organisations interpret environmental performance in the light of their motivations for demonstrating pro-environmental behaviour. The fundamental assumption when demonstrating pro-environmental behaviour is that it will bring about measurable improvement in environmental performance. This assumption by organisations creates an important relationship between pro-environmental behaviour, the existence of environmental performance and its subsequent measurement. As different EMSIFs drive organisations to exhibit pro-environmental behaviour to a greater or lesser extent as revealed by this research, EMSIFs also act as a framework for interpreting the performance achieved by the display of pro-environmental behaviour. This in turn leads organisations to try to determine the existence of tangible environmental performance improvement through the definition and selection of performance measures.

However, the measurement of environmental performance can be a complex and multidimensional issue, especially as organisations have differing operations, regulatory environments and inherent values and interpretations of performance (Bellesi et al., 2005; Hertin et al., 2008). It is notable that environmental performance measurement is dependent on individual organisations' perceptions of what environmental performance is, this being closely related to their reasons for demonstrating pro-environmental behaviour in the first place.

To ensure continual improvement, organisations must show sustained progress in achieving set environmental objectives and improving environmental performance *per se*. Such progress must be clearly demonstrable to organisational stakeholders, which can be achieved through the use of specific, measurable, achievable, realistic and time-bound (SMART) performance indicators (Brouwer & van Koppen, 2008). These Environment Performance Indicators (EPIs) can be used by organisations in a number ways to measure, scale and monitor environmental performance (Zorpas et al., 2010). However, as EPIs are used as a marker of environmental performance, this being interpreted by organisations in light of particular pro-environmental motivations, it is logical that the selection and use of EPIs should accordingly reflect organisational perceptions of environmental performance.

While EPIs provide a useful means by which environmental performance may be measured, there have been criticisms about the generalization and non-specific recommendation of EPIs, especially by EMS frameworks. Frameworks such as EMAS (EMAS III includes six core environmental performance indicators that all EMAS registered companies are to use and report on) and the Global Reporting Initiative (which includes a common set of environmental, social and economic indicators which have a bearing on pro-environmental behaviours) have been able to recommend EPI measures for use by organisations (EMAS, 2010; GRI, 2011). However, different frameworks have been unable to provide uniform measures for environmental performance for different organisations (Delmas, 2002). Indeed, it is debatable whether, considering organisational differences, there should be strictly common EPIs used by all organisations. Still, the need for measurable and objective means for continually assessing environmental performance improvement remains, especially as it relates to each organisation's operations and perceptions.

This chapter makes the assumption that EPIs constitute an important means by which the impact of pro-environmental behaviour on environmental performance may be measured. Using data obtained from 200 organisations in Nigeria, the chapter aims to identify EPIs in use, and investigate trends in their use by different organisations. Results of this research will serve to introduce greater specificity into the use of EPIs while giving insight into more appropriate means by which environmental performance may be measured. The research also seeks to identify and clarify the link between organisational characteristics (organisational size, geographical location, industry, ownership, corporate structure and turnover) and the measurement of environmental performance through the use of EPIs as objective measures of performance.

## 7.2 Research objectives

The objectives of this chapter are:

1. To identify and analyse objective means for measuring environmental performance, by determining environmental performance indicators in use by organisations in a developing

country context, and by analyzing patterns in the use of environmental performance indicators;

2. To critically evaluate the extent to which environmental performance indicators being measured by organisations are suitable for measuring environmental performance (as it is perceived by organisations).

## 7.3 Review of the literature

### 7.3.1 Measuring environmental performance

There are different ways in which environmental performance can be measured, with a number of different models providing explanations of performance measurement. One model, represented in Figure 7.1 suggests that environmental performance should be measured in five dimensions (Tam et al., 2006). This model suggests that, for environmental performance to be effectively measured, emphasis should be placed on an organisation's environmental costs, product/service environmental aspects, the environmental efficiency of its production processes, environmental impacts and general management of environmental issues. While the model is useful to some extent, it does not provide further clarification of what environmental performance is, or suggest practical ways in which it may be measured.

Another model explains that the assessment or measurement of environmental performance can be viewed in two ways. The first is by expressing environmental performance through the use of objective indicators of operational performance such as emissions, water, energy and resource use and waste generation, as these quickly reflect short-term alterations in environmental performance. The second is by viewing environmental performance against the achievement of more subjective measures, such as perceived environmental improvements like better relations with the regulator/customer/supplier and market advantage (Nawrocka & Parker, 2008). However, it is debatable whether these environmental benefits are merely perceived. Indeed, once pro-environmental behaviour is practiced, benefits, especially those that can be measured such as cost savings, become tangible. Other methods of measuring environmental performance include taking note of the number of non-conformances issued

within an EMS, relative to the frequency of EMS audits and observing reports of marginal cases (Tam et al., 2006).


*Figure 7.1 - Model for measuring environmental performance (adapted from Tam et al 2006)*

The variation in these models shows the complexity of measuring environmental performance, as there are no widely agreed planes along which it may be viewed. The diversity of organisational operations, functions and settings also increases the complexity of environmental performance assessment. However, if different aspects of environmental systems implementation are linked to relatively simple and objective measures of performance such as indicators, it becomes possible to practically determine how an organisation is performing environmentally (Brouwer & van Koppen, 2008; Hertin et al., 2008).

### 7.3.2 Definitions of performance indicators and EPIs

Performance indicators are used by many organisations worldwide (Brouwer & van Koppen, 2008), and are defined in a number of ways. Perotto et al (2007) presents a number of definitions of performance indicators. One definition is that indicators *'parameters (or values*

*derived from parameters), which describe a phenomenon, environment or area with a significance extending beyond that directly associated with the parameter value'*. Another definition is that they are '*variables (an operational representation of an attribute i.e. quality, characteristic or property) that describe a system and represent the image of an attribute, defined in terms of the specific measurement or observation procedures'* (Perotto et al., 2007, p.520).

Figure 7.2 gives an overview of further definitions of EPIs as reported by previous research studies. These definitions have many similarities, each describing EPIs as tools, variables or numeric quantities. In all definitions EPIs are referred to as a means of measuring or assessing conditions relating to environmental management. Different EPIs possess the similarity of being used as convenient units of measurement. However, differences do exist in the nature of what is to be measured and reported. Since environmental performance covers organisations' entire operations, indicators are required to measure different forms of organisational elements such as core operations, production, management, sales and communication.

EPIs can be used by organisations to i) serve as a benchmarking tool that combines a number of management initiatives into simple indicative measures, ii) summarize complex operational environmental data, iii) identify gap or problem areas in environmental performance, useful in serving as a warning signal, iv) compare performance with industry standards, v) identify opportunities for environmental improvement and cost savings, vi) communicate effectively with external stakeholders by providing them with easily understood metrics about operations and environmental performance, vii) generally track environmental progress and performance (Zorpas et al., 2010). Though EPIs have many potential uses, it appears that organisations have not made full use of the advantages they present. There may also be a tendency amongst organisations to use similar EPIs regardless of the dissimilarities in their operations, organisational or pro-environmental motivations.

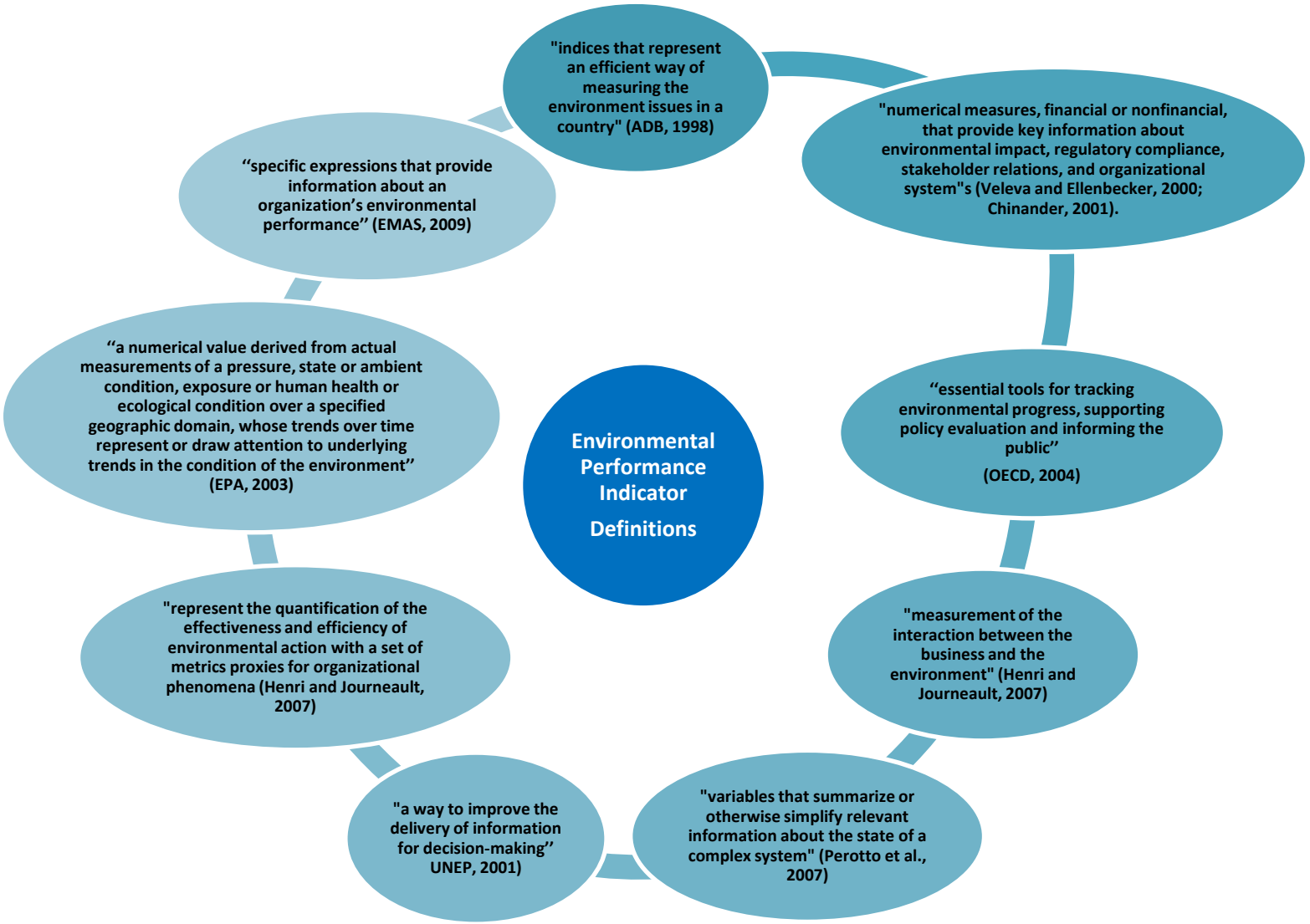



*Figure 7.2 – Environmental performance indicator definitions*

### 7.3.3 The categorisation of EPIs

A number of recognized EPI frameworks[19] have been developed for measuring organisational environmental performance through the use of EPIs, and indicators have been categorised by different performance indicator models. The ISO 14031:2013 guidance standard – *Environmental Management – Environmental Performance Evaluation – Guidelines* provides a framework for environmental performance evaluation built around the intra-organisational use of environmental indicators. According to ISO 14031:2013, there are two types of environmental indicators which organisations can use for evaluating environmental performance – EPIs and Environmental Condition Indicators (ECIs). While EPIs are expressions that provide information about organisational environmental performance, ECIs are defined as *'environmental performance indicators that provide information about the local, regional, national or global condition of the environment'* (ISO, 2013 pg. 2). According to the guidance document, the sub-category of EPIs is further classified into Operational Performance Indicators or OPIs (i.e. EPIs that *'provide information about the environmental performance of an organisation's operational process' pg. 3*) and Management Performance Indicators or MPIs (i.e. EPIs that *'provide information about the management activities to influence an organisation's environmental performance' pg. 3*).

However, despite the widespread adoption of the ISO 14001 EMS standard, ISO 14031:2013 is criticized for its continued generalization and lack of specificity in recommending EPIs, and its inability to provide uniform measures for environmental performance across a range of industries (Delmas, 2002). Other support standards – ISO 14032:1999 and ISO 14033:2012 exist but these have done little to reduce criticisms. ISO 14032:1999 focuses on environmental performance evaluation and does not refer to specific performance indicators and ISO 14033:2012 gives a more detailed approach to developing and applying quantitative indicators for environmental performance evaluation (ISO 1999; ISO 2012).

Continued criticism may be due to the non-specificity of the main EMS standard itself, which merely provides direction for the setting up of a system to manage environmental issues within a range of organisations in all industry sectors. As the standard attempts to

[19] ISO 14031:2013 - Guidelines for Environmental Performance Evaluation, The Global Reporting Initiative (GRI), Social Accountability (SA 8000), the World Business Council for Sustainable Development (WBCSD), the European Environmental Framework of the European Environmental Agency (EEA) and the Eco Management and Audit Scheme (EMAS III) (Brouwer and van Koppen, 2006).

provide guidance without giving specific direction to organisations, it also does not specifically recommend EPIs for use in measuring environmental performance. An argument can be made that, in the same way that a single management system standard cannot address EMS processes in different organisations in specific detail, a set of EPIs cannot be prescribed which will be equally relevant or applicable to a range of organisations with different operational realities.

Internationally recognized frameworks developed for measuring organisational environmental performance include the Eco Management and Audit Scheme (EMAS), which addresses three categories of performance indicators (operational performance indicators, management performance indicators and environmental condition indicators), the Global Reporting Initiative (GRI), which are guidelines for sustainable reporting on economic, environmental and social aspects of activities, products and services, the Social Accountability (SA 8000) standard which addresses eight categories of performance indicators, including environmental indicators, the World Business Council for Sustainable Development (WBCSD) framework, which is a coalition of 170 international companies jointly committed to sustainable development across three pillars (economic growth, ecological balance and social progress), and the European Environmental Framework of the European Environmental Agency (EEA), which is a framework that provides 32 environmental indicators for the measurement, communication and analyzing of sustainable development (Brouwer & van Koppen, 2008). The criticism of the lack of specificity of these performance indicator frameworks in addressing the measurement of environmental performance may be unfounded, as these frameworks must maintain a certain degree of generality to remain applicable to a wide range of organisations. As such, it appears that a measure of specificity is compromised in order to ensure that indicator frameworks are more widely applicable. However, there are overlaps and commonalities between frameworks, with the most generic EPIs being listed in Table 7.1.

Interestingly, these generic EPIs do not address all of the factors that were identified in Chapter 6 as being influential in shaping organisational perceptions of environmental performance. The subjectivity in perceptions of environmental performance also makes the selection and use of EPIs an issue of subjectivity for organisations, as the measurement of environmental performance should reflect pro-environmental organisational motivations responsible for shaping perceptions. This may explain why environmental standards such

as ISO 14001 do not specifically recommend indicators, but instead make general statements on the need for organisations to monitor and measure performance.

*Table 7.1 – Environmental performance indicators common to performance indicator frameworks (Source: Brouwer & van Koppen, 2008)*

| **Category** | **Performance Indicators** |
|---|---|
| Output/Process Indicators (equivalent to operational performance indicators as categorised by ISO 14031:1999) | Energy use (fossil fuels, renewable energy, recycled energy) |
| | Material use |
| | Specific emissions to air ($CO_2$, $NO_x$, $SO_2$, H(CFCs), VOC |
| | Amount of discharged waste water |
| | Amount and composition of waste (domestic, industrial, dangerous) |
| | Recollection of waste for recycling/recovery |
| Management Indicators | Total environmental costs |
| | Total environmental investments |
| | Amount and/or investment in environmental education |
| | Number of incidents and accidents |
| | Number of complaints |
| | Number of environmental ideas of personnel |

## 7.4 Methods used

### 7.4.1 Sampling, questionnaire design and administration

Data was collected from 200 organisations operating in the developing country setting of Nigeria. Information was retrieved from organisational respondents using structured questionnaires. Respondents were given a list of EPIs, including OPIs and MPIs, and asked to indicate which EPIs they measured frequently, occasionally or not at all. Chapter 3 of this thesis contains details of questionnaire design and administration methods used for this research survey.

### 7.4.2 Data analysis

Data analysis was done using Microsoft Excel® (Version 2013) and SPSS software (Version 20). Chi squared analysis and contingency table interpretation was done to analyse findings and identify trends in EPI use. The following variables were investigated from data collected:

a) Percentage of organisations using each EPI both frequently and occasionally (Most popularly used EPIs)
b) Percentage of organisations using OPIs vs. percentage of organisations using MPIs
c) Percentage of organisations using EPIs vs. percentage of organisations not using EPIs
d) Analyses of significance in the relationship between organisational characteristics (level of environmental management, industry and size) and the use of EPIs (whether or not an organisation used EPIs)
e) Extent to which EPIs reflect organisational perceptions of environmental performance

## 7.5 Findings

### 7.5.1 Summary statistics

EPIs included in the questionnaire from EPI frameworks, and summary statistics for questionnaire response variables are shown in Table 7.2.

### 7.5.2 Most popularly used EPIs

EPIs used by respondents either frequently or occasionally were analysed. The study reveals that the three (3) most popularly measured EPIs were 'electricity/energy consumption' (used frequently or occasionally by 59% of respondents), 'water consumption' (51%), and 'air emissions' (48%). This is shown in the graph in Figure 7.3.

### 7.5.3 Percentage of organisations using OPIs vs. percentage of organisations using MPIs

Figure 7.3 shows the percentage of organisations using each EPI. The percentage of organisations using EPIs classified as OPIs ranged from 59% (electricity/energy consumption) to 41% (noise levels). However, the percentage of organisations indicating they used MPIs ranged from 39% (use of resources) to 28% (number of environmental ideas of personnel), a significantly lower range than organisations using OPIs. This indicates that OPIs are more used by organisations than MPIs.

*Table 7.2 – Showing summary statistics for questionnaire response variables*

| Variable | N | Minimum | Maximum | Mean | Std. Deviation | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| OPIs MPIs | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| Environmental performance indicators - Water consumption | 101 | 1 | 2 | 1.39 | .489 | .475 | .240 | -1.811 | .476 |
| Environmental performance indicators - Electricity/Energy consumption | 117 | 1 | 2 | 1.31 | .464 | .844 | .224 | -1.310 | .444 |
| Environmental performance indicators - Noise levels | 82 | 1 | 2 | 1.48 | .502 | .100 | .266 | -2.040 | .526 |
| Environmental performance indicators - Air emissions | 95 | 1 | 2 | 1.57 | .498 | -.281 | .247 | -1.963 | .490 |
| Environmental performance indicators - TOC (total organic compounds) Concentration | 76 | 1 | 2 | 1.63 | .486 | -.557 | .276 | -1.737 | .545 |
| Environmental performance indicators - Volume of wastewater released | 83 | 1 | 2 | 1.52 | .503 | -.074 | .264 | -2.044 | .523 |
| Environmental performance indicators - Volume of solid waste released | 84 | 1 | 2 | 1.39 | .491 | .447 | .263 | -1.845 | .520 |
| Environmental performance indicators - Volume of materials recycled | 65 | 1 | 2 | 1.43 | .499 | .286 | .297 | -1.980 | .586 |
| Environmental performance indicators - Use of resources | 77 | 1 | 2 | 1.40 | .494 | .405 | .274 | -1.886 | .541 |
| Environmental performance indicators - Total environmental cost | 65 | 1 | 2 | 1.38 | .490 | .486 | .297 | -1.821 | .586 |
| Environmental performance indicators - Total environmental investment | 63 | 1 | 2 | 1.40 | .493 | .432 | .302 | -1.874 | .595 |
| Environmental performance indicators - Amount and/or investment in environmental training/education | 66 | 1 | 2 | 1.42 | .498 | .314 | .295 | -1.962 | .582 |
| Environmental performance indicators - No of environmental incidents and accidents | 88 | 1 | 2 | 1.26 | .442 | 1.105 | .257 | -.797 | .508 |
| Environmental performance indicators - No of environmental complaints | 70 | 1 | 2 | 1.39 | .490 | .480 | .287 | -1.823 | .566 |
| Environmental performance indicators - Number of environmental ideas of personnel | 55 | 1 | 2 | 1.47 | .504 | .112 | .322 | -2.064 | .634 |
| Environmental performance indicators - Other EPI | 22 | 1 | 2 | 1.41 | .503 | .397 | .491 | -2.037 | .953 |

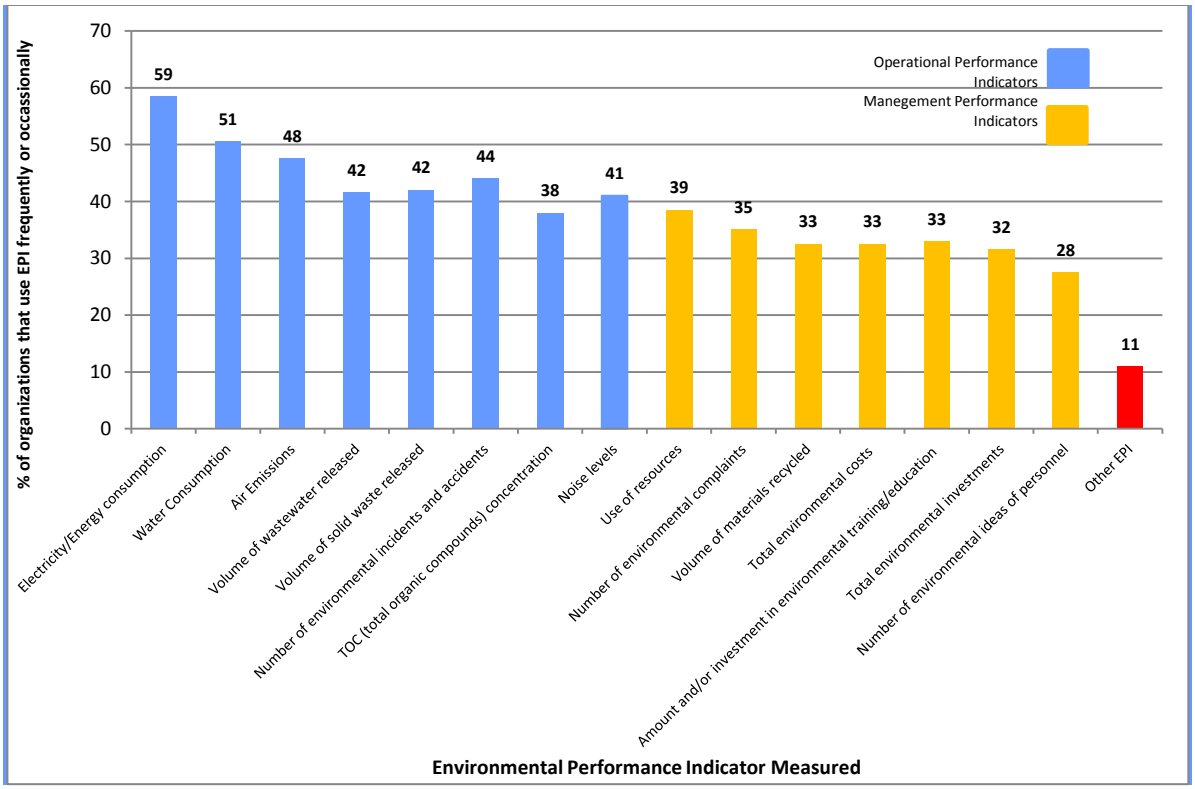



*Figure 7.3 – Percentage of organisations that use EPIs (OPIs and MPIs) frequently or occasionally*

A scatter graph representing EPI use in different industry sectors is depicted in Figure 7.4. The graph was obtained by plotting the number of OPIs used against the number of MPIs used in each of the 200 organisations involved in the survey. A linear XY dividing line was plotted on the graph. The scatter graph function plots each point, thereby producing hundreds of plot points which are divided by the linear XY line. A higher density of plot points on one side of the 1:1 line indicates that that EPI type is more frequently used than the other. The scatter graph produced a significantly larger density of plot points on the OPI side (x-axis), revealing that a larger proportion of organisations use OPIs than MPIs.

Furthermore, in the manufacturing and telecommunications industry sectors, plot points were spread across both axes, indicating that organisations in these sectors generally used both OPIs and MPIs. The oil and gas industry sector had significantly more plot points on the OPI side, showing that organisations in this industry sector used mainly OPIs.

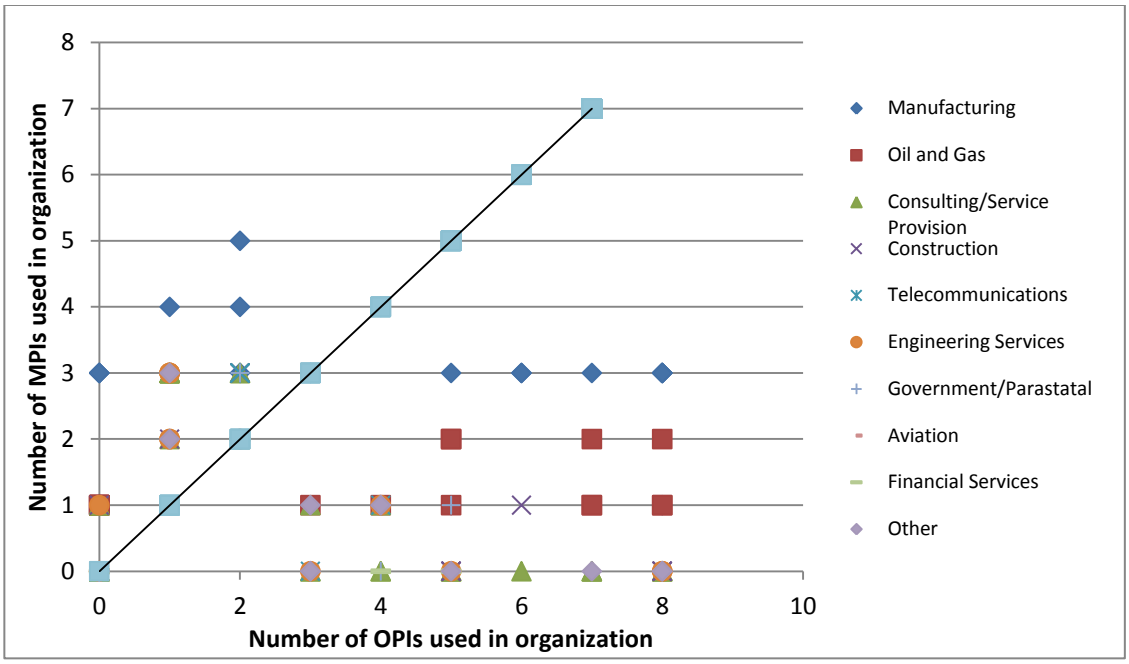



*Figure 7.4 – Scatter diagram showing trends in EPI use in different industry sectors*

### 7.5.4 Percentage of organisations using EPIs vs. percentage not using EPIs

The majority of organisations (84%) responding to the questionnaire indicated that they used EPIs. The remaining 16% did not indicate any use of EPIs.

### 7.5.5 Analyses of significance in relationship between organisational characteristics and the use of EPIs

The Pearson's Chi Square ($\chi^2$) test was used to determine the degree of significance in the relationship between organisational characteristics (level of environmental management, industry, size and turnover) and the use of EPIs. This was done by computing a ($\chi^2$) value, where:

*If ($\chi^2$) p-value < 0.05, the relationship between variables is significant,*

*if ($\chi^2$) p-value < 0.01, the relationship between variables is highly significant and,*

*if ($\chi^2$) p-value < 0.001, the relationship between variables is very highly significant*

Table 7.3 shows calculated $\chi^2$ values. Results reveal significant relationships between EPI use and level of environmental management, organisational turnover and organisational size. There was no significant relationship between an organisation's industry sector and its use of EPIs.

*Table 7.3 – Chi-Square Analysis Results*

| Variable A vs. Variable B | Pearson's Chi-Square Statistic | Significance |
|---|---|---|
| Organisation's level of environmental management vs EPI use | 0.000 | Statistically very highly significant relationship (i.e. the organisational characteristic has a strong impact on the use of EPIs) |
| Organisational industry sector vs EPI use | 0.557 | No significant relationship, no impact (i.e. there is no relationship between the organisational characteristic and the use of EPIs) |
| Organisational size vs EPI use | 0.023 | Statistically significant relationship (i.e. the organisational characteristic has an impact on the use of EPIs) |
| Organisational turnover vs EPI use | 0.000 | Statistically very highly significant relationship (i.e. the organisational characteristic has an impact on the use of EPIs) |

However, though Chi Square statistical tests indicate the existence of significant relationships between groups of variables, they do not determine the direction or nature of these relationships. Further analysis of data, by examining row x column (RC) frequency contingency tables was undertaken to determine the nature of any significant relationships between variables. Chi Square p-value results on the existence of relationships between organisational characteristics and the use of EPIs are shown below.

a) **Organisations' industry level of environmental management affects the use of EPIs** - There is a statistically significant relationship between an organisation's level of environmental management and its use of EPIs (Pearson's Chi-Square p-value of 0.000). This means that an organisation's use of EPIs is affected by the extent to which it manages environmental issues. On further interpretation/analysis of the RC frequency contingency table generated during Chi Square analysis, the following frequency ratios where observed (shown in Table 7.4).

*Table 7.4 – Level of environmental management R x C frequency ratios*

| Level of Environmental Management | Ratio of EPI use vs. non-use |
|---|---|
| (1) ISO 14001 Certified | 11:1 |
| (2) Working towards ISO 14001 certification | 16:1 |
| (3) Formal EMS Certification | 10:1 |
| (4) Informal EMS | 7.6:1 |
| (5) Some environmental procedures | 8.1:1 |
| (6) No environmental system/procedures | 0.4:1 |

Results in Table 7.5 show that the higher the level of environmental management, the greater the use of EPIs, as organisations with 'no environmental system/procedures in place' had a significantly lower ratio of EPI use than other levels of environmental management.

b) **Organisations' industry sector does not affect the use of EPIs** - From the results of Chi-Square analysis, there was no statistically significant relationship between an organisation's industry sector and its use of EPIs (Pearson's Chi-Square p-value of 0.557). This indicates that an organisation's use of EPIs is not affected by the industry sector in which it operates.

c) **Organisations' size affects the use of EPIs** - There was a statistically significant relationship between an organisation's size (number of employees) and its use of EPIs (Pearson's Chi-Square p-value of 0.023). This means that an organisation's use of EPIs is affected by its size. On interpretation/analysis of the R x C frequency contingency table generated during Chi Square analysis, the following frequency ratios where observed (shown in Table 7.5).

*Table 7.5 – Organisational size R x C frequency ratios*

| Organisational Size | Ratio of EPI use vs. non-use |
|---|---|
| (1) 1-10 Employees | 1.7:1 |
| (2) 11-50 Employees | 7.4:1 |
| (3) 51-250 Employees | 6.3:1 |
| (4) Above 250 Employees | 7.3:1 |

Results in Table 7.5 indicate that very small organisations (with 1 – 10 employees) had a lower rate of EPI use than larger organisations (with 11 or more employees).

d) **Organisations' Turnover affects the use of EPIs -** There was a statistically significant relationship between an organisation's turnover and its use of EPIs (Pearson's Chi-Square p-value of 0.000), indicating that an organisations use of EPIs is affected by its turnover. On interpretation/analysis of the RC frequency contingency table generated during Chi Square analysis, the following frequency ratios were observed (Table 7.6).

*Table 7.6 – Level of environmental management frequency ratios*

| Organisational Turnover (Nigerian Naira – NGN)[20] | Ratio of EPI use vs. non-use |
|---|---|
| (1) – Below 10 million NGN | 1.5:1 |
| (2) – 11-50 million NGN | 9:1 |
| (3) – 51-100 million NGN | 13:1 |
| (4) – Above 100 million NGN | 16.5:1 |

Results in Table 7.6 indicate that, the higher the turnover of an organisation, the more likely it is to use EPIs.

### 7.5.6 Extent to which EPIs used reflect organisational perceptions of environmental performance

In order to assess the extent to which currently used EPIs reflect actual organisational perceptions of environmental performance, EPIs in use were compared with perceptions influencing organisations' interpretation of environmental performance, as shown in Table 7.7. Organisational perceptions were matched with existing EPIs (from EPI Frameworks) suitable for measuring environmental performance based on those perceptions. Appropriate EPIs were suggested for perceptions with no suitable existing EPIs or where there were opportunities for additional EPIs. Table 7.7 shows that organisations did not measure any EPIs suitable for the following perceptions - 'Organisational Market', 'Environmental Impact Consciousness', 'Existence of Documentation and other Management System Elements' and 'International and Industry Best Practices'.

[20] 1NGN (Nigerian Naira) = 210USD (United States Dollar) as at May 2015

## 7.6 Discussion

### 7.6.1 Trends in the use of EPIs

This study reveals that more organisations in general use EPIs (84% of respondent organisations used EPIs and 16% did not). EPI use does not appear to be affected by the region in which an organisation operates.

Of all EPIs used by Nigerian organisations in this study, the three most frequently measured were 'electricity/energy consumption', 'water consumption', and 'air emissions', these all being OPIs. Study findings also reveal that out of the top ten (10) EPIs cited by respondents as being used 'frequently' or 'occasionally', eight (8) were OPIs. This is further confirmed by scatter diagram results which showed that more scatter points (dots) fell within the OPI half of the graph.

This result indicates that organisations within the study sample used OPIs more than MPIs. OPIs are more easily applicable and relevant to organisations' operations and overall bottom-line, leading more organisations to measure or benchmark environmental performance using OPIs. OPIs also have a more direct impact on performance improvement, revealing opportunities for better operational efficiencies and cost minimization (such as in energy and water minimization as revealed by the study) and providing an input for objective/target setting, performance measurement and environmental reporting. All these functionalities are more readily understood and interpreted by management.

*Table 7.7 – Assessment of suitability of EPIs for measuring environmental performance*

| Environmental performance perception | Suitable existing EPIs common to EPI frameworks (as included in research questionnaire) | EPI type | Additional EPIs suggested for improved environmental performance measurement | EPI type |
|---|---|---|---|---|
| Organisational Efficiencies | Volume of wastewater released | OPI | None | - |
| | Volume of solid waste released | OPI | | |
| Organisational Resources | Water consumption | OPI | None | - |
| | Electricity/Energy consumption | OPI | | |
| | Use of resources | MPI | | |
| | Total environmental cost | MPI | | |
| | Total environmental investment | MPI | | |
| Environmental Efficiencies | Noise levels | OPI | None | - |
| | Air emissions | OPI | | |
| | TOC (total organic compounds) Concentration | OPI | | |
| | Volume of wastewater released | OPI | | |
| | Volume of solid waste released | OPI | | |
| | Volume of materials recycled | OPI | | |
| Organisational Market | None | - | Customer opinion on environmental performance | MPI |
| | | | Number of viewings (hits) on publicly available online environmental documents | MPI |
| External Financial Institutions | Total environmental cost | MPI | Environmental savings (ISO, 1999) | MPI |
| | Total environmental investment | MPI | Amount spent on environmental research and development (ISO, 1999) | MPI |
| | Number of environmental incidents and accidents | MPI | | |
| Employee Awareness & Commitment | Number of environmental ideas of personnel | MPI | None | - |
| | Amount and/or investment in environmental training/education | MPI | | |
| Management Commitment | Amount and/or investment in environmental training/education | MPI | Number of management reviews held on environmental matters | MPI - |
| | Total environmental investment | MPI | | |
| Environmental Impact Consciousness | None | - | To be addressed in discussion (Section 7.6) | |
| Societal Pressures & Influences | Number of environmental complaints | MPI | Public opinion/favorability ratings on environmental performance (ISO, 1999) | MPI |
| | | | Disclosure of environmental expenditure (Ilinitch et al., 1998) | MPI |
| | | | Number of enquires about environmental matters (ISO, 1999) | MPI |
| | | | Number of press reports on environmental performance (ISO, 1999) | MPI |

*Table 7.7 (cont.) – Assessment of suitability of EPIs for measuring environmental performance*

| Environmental performance perception | Suitable existing EPIs common to EPI frameworks (as included in research questionnaire) | EPI type | Suggested additional EPIs | EPI type |
|---|---|---|---|---|
| Regulation | Number of environmental incidents and accidents | - | Number of environmental regulatory violations, penalties or fines | MPI |
| | | | Number of regulators' visits/inspections (GEMI, 1998) | MPI |
| | | | Monetary value of significant fines (GRI, 2011) | MPI |
| | | | Number of corrective actions issued by regulators | MPI |
| Existence of Documentation & other Management System Elements* | None | - | Number of internal management system (environmental) audits held (ISO, 1999) | MPI |
| | | | Number of non-compliances issued or audit findings during internal (or external) management system audits (Ilinitch et al., 1998; ISO, 1999) | MPI |
| | | | Number of procedure/documentation reviews done (ISO, 1999) | MPI |
| International and Industry Best Practices* | None | - | Existence/Number of international endorsements held (certifications, best practice standards etc.) | MPI |
| | | | Number of management system audits held | MPI |
| | | | Number of non-compliances issued or audit findings during management system audits (Ilinitch et al., 1998; ISO, 1999) | MPI |

* New factors obtained from respondents qualitative responses to meaning of environmental performance question

Some studies claim that organisations, irrespective of characteristics such as size, industry and turnover usually carefully measure, monitor and document information on their OPIs (Comoglio & Botta, 2011; Radonjic & Tominc, 2007). However, this study reveals that EPI use is affected by organisations' level of environmental management, size (number of employees) and turnover. Results of Chi Square analysis and R x C frequency table interpretation showed the existence of statistically significant relationships between EPI use and organisation's level of environmental management, size and turnover. Statistical tests and interpretation confirmed that there is a skew towards the use and measurement of EPIs irrespective of organisational characteristics.

Results indicate that as the level of environmental management decreases (i.e. from EMS certification to having no environmental system or procedures in place at all), EPI use also decreases. Results also indicate that larger organisations (those having from 11 employees upwards) use more EPIs than very small organisations (with less than 10 employees). Apparently, as an organisation increases in size, its need to improve and monitor its operational performance may lead to the subsequent adoption of EPI measurement. However, it may also mean that larger organisations have more staff resource available for measuring and monitoring EPIs. From the results, it appears that an organisation may begin to realize this need as it increases in size. Additionally, results indicate that there is no difference in EPI use between smaller organisations having between 11 and 50 employees and very large organisations having over 250 employees.

There is a statistically significant difference between organisations' turnover and EPI use, and results reveal that, as an organisation's turnover increases, its use of EPIs also increases. Most organisations require substantial resources (human, financial and time), usually only available to richer organisations, to establish and maintain EPI monitoring programs.

Though EPIs may present an objective means for measurement, the fact that perceptions of environmental performance may differ in different organisations makes it difficult to determine improvement even though information from EPI parameters is available.

### 7.6.2 EPI use and environmental performance perceptions

There is a lack of consistent alignment between organisations' use of EPIs and their perceptions of environmental performance. EPIs predominantly used were OPIs associated with environmental performance perceptions such as organisational efficiencies, organisational resources and environmental efficiencies. Indeed, OPIs are generally more frequently used by organisations, although pro-environmental motivations and perceptions of environmental performance are not always directly associated with OPIs being measured. Though the predominant use of OPIs indicates that organisations view environmental performance in the light of operational and environmental efficiencies, Chapter Six results on issues guiding organisational perceptions reveal that more organisations viewed

environmental performance in the light of organisational markets, regulation, existence of documentation (and other management system elements) and international (and industry) best practices.

Interestingly, EPIs associated with these later-mentioned perceptions (most of which are represented by MPIs) are not frequently used by organisations. Although these MPI-type EPIs exist and have been designed and recommended for use by a number of frameworks and research bodies, the popularity and seeming preference of OPIs over MPIs has been consistent. OPIs appear to symbolize a more objective and quantifiable representation of environmental performance than MPIs, explaining why they may be preferred by organisations. Organisations may also be more historically familiar with measuring OPIs. This may be because early performance indicator frameworks such as EMAS, SA 8000 and ISO 14000 placed more emphasis on OPIs than MPIs in the measurement of environmental performance. Other than this, it is unclear why organisations arbitrarily lean towards using OPIs rather than MPIs, especially as there is no specificity in the use of EPIs.

'Environmental impact consciousness' emerged clearly from respondents' views of environmental performance, with responses like, "…..we place a high premium on the environment"…., "…..what we are doing with respect to impacting the environment…..", "….the environment matters to us…..", "… the impact of our activities on the environment….", "….. our ability to carry out our operations without any negative impact on the environment….." and "…. making sure that the environment is not in any way degraded….". The consciousness of environmental impacts is not an objective, tangible quantity and presents difficulties for measurement. However, it is an important perception shaping an organisation's view of environmental performance because it results in a view that environmental performance means reducing negative impacts, leading to the greater (and more efficient) use of EPIs. As such, this perception should contribute to the basis for the selection and measurement of EPIs. EPIs directly relating to this perception were not found in previous literature, EPI frameworks or management system standards, but there are opportunities for using or amending existing EPIs for measurement. EPIs for measuring performance in organisations with this perception should reflect the extent to which the organisation is aware of (and making attempts to minimize) its environmental impact. As with

perceptions, the selection of EPIs in this case would also be specific to the organisation. A suitable EPI for measuring environmental impact consciousness is an organisation's carbon footprint, mainly because this EPI represents a proactive step taken by an organisation to understand its entire environmental impact. It has been noted that the suitability of this EPI is dependent on the organisation using it (Laurent et al., 2010), the presence and regularity of review of an environmental aspects register, and the number of environmental training events attended by employees within a specific period. However, organisations may also measure their carbon footprint without necessarily being conscious of actual impacts or having a good understanding of how greenhouse gases affect the environment.

Organisations with an 'organisational market' perception of environmental performance face the challenge of attempting to measure environmental reputation as perceived by their respective markets. These organisations should focus on selecting and measuring MPIs related to customer views and reactions to organisational environmental image, including 'customer opinion on environmental performance' and 'number of viewings (hits) on publicly available online environmental documents'.

Suitable EPIs for measuring environmental performance in organisations with 'international and industry best practices' and 'existence of documentation and other management system elements' perceptions would be the existence/number of international endorsements held (e.g. certifications and best practice standards), the number of management system audits held, the number of non-compliances issued or audit findings during audits (Ilinitch et al., 1998; ISO, 1999) and the number of procedure/documentation reviews done (ISO, 1999). These EPIs provide organisations with the advantage of benchmarking themselves against industry and best practice, while monitoring performance. EPIs for measuring continual improvement are also applicable, as this is a fundamental element of management system/standard implementation.

Organisations' operations and environmental aspects and impacts have an important influence on the EPIs they select and use, and in fact provide the basis for this selection. However, environmental performance relates to not only organisational operations and physical environmental aspects/impacts, but other components including the social, regulatory,

political and economic environments surrounding organisations. Subsequently, organisations' use and measurement of EPIs should encompass all these considerations.

EPI frameworks and management system standards, in not prescribing specific EPIs but advising organisations to choose EPIs best suited to them for assessing environmental performance, acknowledge the subjectivity inherent in the perception and assessment of performance. EPIs are primarily meant to elicit data which gives information about how well organisations are performing 'environmentally'. This performance is based not only on organisational operations, environmental aspects and impacts but on each organisation's main perceptions, pro-environmental motivations and objectives.

## 7.7 Research limitations, gaps and future research opportunities

Data analysis was restricted to data provided by organisations' responses to questions. Data analysis was also restricted by a moderate number of non-responses (8% of responses), in which respondents did not provide any information on EPI use. It was difficult to ascertain if these non-responses were as a result of not using a particular EPI or a lack of understanding of the question.

Future research opportunities exist in further investigating the nature of relationships between organisations' characteristics (such as size, turnover, industry) and EPI use. It would also be useful for research to be conducted in determining reasons for the use of or preference for OPIs over MPIs, as well as determining possible organisational trend relationships within this preference. In addition, broader research indicates that there is a close association between EMSIFs, perceptions of performance and the use of EPIs. Further research should explore overlapping EMSIFs and how multiple perceptions of performance affect the use of EPIs.

## 7.8 Summary

Nigerian organisations make use of different EPIs, measuring more OPI-type EPIs than MPI-type EPIs. The three most popularly measured EPIs were 'electricity/energy consumption', 'water consumption' and 'air emissions', with OPIs being more related to organisational

efficiencies and bottom-lines, organisations tend to focus on them as a means of measuring environmental performance. However, the perceptions shaping organisations' views of environmental performance should be reflected in the selection and use of performance indicators. Organisations, in acknowledging their inherent perceptions should instead focus on selecting and using EPIs that reflect such MPIs as - customer opinion on environmental performance, number of viewings (hits) on publicly available online environmental documents, number of management reviews held on environmental matters, disclosure of environmental expenditure, number of enquires about environmental matters, number of press reports on environmental performance, number of environmental regulatory violations, penalties or fines, number of regulators' visits/inspections, monetary value of significant fines, number of non-compliances issued or audit findings during internal (or external) management system audits, and the existence/number of international endorsements held.

# CHAPTER EIGHT

# SYNTHESIS OF FINDINGS AND SUMMARY

## 8.1 Synthesis of findings and overall research summary

Pro-environmental behaviour of organisations involves actions, direct and indirect, taken in the interest and for the benefit of the natural environment. The intended result of all forms of pro-environmental behaviours is an actual (or perceived) improvement in environmental performance. Evaluating organisational pro-environmental behaviours is an important step in the process towards understanding organisational motivations, and establishing a link between the demonstration of pro-environmental behaviour and a change in environmental performance. Such knowledge leads to a better understanding of the pro-environmental behaviours which actually bring about a positive change in environmental performance. This is vital in fostering the creation of enabling conditions for organisations to demonstrate and sustain pro-environmental behaviour.

In an attempt to evaluate pro-environmental behaviours, several studies have developed categorisation systems or models for grouping factors related to organisational motivations. Such factors include the drivers motivating organisations towards pro-environmental behaviour, the benefits (potential or actual) that they gain from these actions, and the barriers preventing them from displaying such behaviour. To collectively refer to factors affecting pro-environmental behaviour, in this thesis the term EMS implementation factors (EMSIFs) has been adopted. The models of pro-environmental behaviour factors that have been developed to date have supported geographically-specific or organisationally-specific studies, but have limited wider applicability. Therefore, this thesis describes the development and application of a new, more robust categorisation model that can facilitate the effective assessment and evaluation of EMSIFs affecting pro-environmental behaviour across the broad range of organisational contexts.

The Factors Affecting Corporate Environmental Systems (FACES) EMSIF categorisation model developed in Chapter 4 consists of four quadrants which effectively address the

grouping of EMSIFs affecting organisations. According to the model, EMSIFs may be internal neoclassical efficient choice factors, external neoclassical efficient choice factors, internal social institutional factors or external social institutional factors. The four FACES quadrants represent major classifications historically explaining organisational pro-environmental behaviour motivations. Pro-environmental behaviour EMSIFs can be functionally categorised using the two prominent theoretical perspectives in organisational motivational research – the neoclassical efficient choice and the social institutional perspectives. The neoclassical efficient choice quadrant represents traditional organisational motivations, where organisations are driven to exhibit such actions as pro-environmental behaviour primarily by efficiencies, profitability and productivity, and the social institutional quadrant represents social factors interacting with organisations which also influence and drive behaviour, including people, societal groups and institutions.

EMSIFs also exist on a geographical plane and can stem from (or impact) the internal or external environment of organisations, providing the basis for the internal-external divide of the FACES model. In cross-combining these two divides, the model provides a comprehensive set of categories useful for evaluating factors affecting organisational pro-environmental behaviour. This makes the model very useful in analyzing the factors that make organisations take decisions in favor of preserving or improving the natural environment. Furthermore, by analyzing the interplay between factors that influence organisational behaviour, the model can lead policy makers to better understand the factors to which organisations will respond, thereby assisting them in the creation of enabling conditions to encourage, nurture and sustain pro-environmental behaviour.

EMSIFs reported from previous EMS studies (n=22) were successfully evaluated by the FACES model, demonstrating its ability to categorise a large number of pro-environmental behaviour factors. To confirm its usability, the model was used by independent researchers (n=12) to successfully categorise EMSIFs from previous EMS studies. 6 of these researchers were able to fit 100% of EMSIFs (n=141) into a FACES model category.

With its broad applicability confirmed, the FACES model can be used to analyse a range of pro-environmental behaviours. The model was used to assess pro-environmental behaviour across different geographical and economic regions by categorising the same EMSIFs

arranged according to the regions in which studies were conducted. Results showed that pro-environmental behaviour is affected by geographic and economic factors. Studies based in Africa and West Asia had the lowest study ratios for internal neoclassical efficient choice EMSIFs, indicating that the pro-environmental behaviour of organisations in these regions is least affected by internal efficiencies and profitability. Studies in the North America region had the highest study ratio for external neoclassical efficient choice factors, indicating the strength of external institutions like financial institutions and customer markets in influencing pro-environmental behaviour. The Europe region recorded the highest study ratio for internal social institutional EMSIFs, while the Far East region had the lowest ratio for this category, indicating that European organisations are more greatly affected by internal social groups, such as employees than their Far Eastern counterparts. Within the economic categorisation, the developing country category had the lowest study ratio for external neoclassical efficient choice EMSIFs, implying that organisations in developing countries are least likely to be influenced by external neoclassical efficient choice EMSIFs such as marketplace advantage. The ability of the FACES model to assess EMSIFs across geographic and economic regions shows that the model may also be used to achieve the same objective across country and other functional categories.

The FACES model was also used to evaluate results of EMSIF ratings gathered through a structured questionnaire, from 200 organisations across 9 industry sectors in the developing country setting of Nigeria. Findings revealed that organisations were primarily motivated towards pro-environmental behaviour by internal social institutional EMS factors, and they gained more internal benefits and were barred more by internal barriers than external. The first 4 of the top 5 ranked EMS drivers were internal social institutional EMS factors. These were 'environmental concern', 'opportunity to avoid/contain pollution', 'desire to integrate environmental considerations into corporate strategy' and 'environmental/social responsibility'. Respondent organisations possess a considerable degree of internally generated environmental awareness and concern, which in turn drives their pro-environmental behaviour. Interestingly, 3 of the top 5 rated benefits - 'reduced environmental accidents and improved site safety', 'improved employee awareness/knowledge of environmental issues and 'improved organisational and operational efficiency' were internally derived benefits. Similarly, out of the top 5 rate barriers, 4 were internal. They were 'cost of

implementation/budget barriers', 'lack of resources', 'extensive documentation involved' and 'lack of top management commitment'. Three (3) of these barriers were internal neoclassical efficient choice EMSIFs. The use of FACES model quadrants in assessing EMSIFs from respondent organisations provides a uniform method for evaluating EMSIFs across industry sectors.

Variations in respondents' ratings of EMSIFs show that there are differences in the exhibition of pro-environmental behaviour in different organisations. Most importantly, organisations experience varying motivations to display pro-environmental behaviour. These variations are as a result of fundamentally different characteristics owned by each organisation. Comparisons between respondent organisational characteristics and EMSIF ratings revealed that pro-environmental behaviour is affected by characteristics such as organisation size, industry sector, turnover, corporate structure and ownership structure. Subsequently, the extent to which EMSIFs impact on organisations' pro-environmental behaviour is dependent on their fundamental characteristics. This research shows that the importance of internal neoclassical efficient choice EMSIFs such as cost of EMS implementation, insufficient resources, budget barriers and economic returns/cost savings to organisations is dependent on the industry sector in which they operate. The impact of the internal neoclassical efficient choice EMSIF, 'need to use external consultants' on organisations pro-environmental behaviour was found to be dependent on organisation size, turnover and corporate structure. Similarly, results showed that organisations geographical location, industry sector and size affect how external neoclassical efficient choice factors such as interaction with customers and market impacted on pro-environmental behaviour. Research results also reveal that organisational characteristics affect how internal and external social institutional factors impact on pro-environmental behaviour. Further research should be conducted into analyzing the nature of relationships between organisational characteristics, EMSIFs, pro-environmental behaviour and resulting environmental performance.

An improvement in environmental performance is the primary result sought by organisations demonstrating pro-environmental behaviour. However, there is no one generally accepted definition of environmental performance. Environmental performance is interpreted in different contexts by different organisations, and its perception is based on the characteristics

and pro-environmental behaviour motivations of each organisation. Predominantly, organisations interpret environmental performance in the light of perceptions such as environmental impact consciousness (interpretations in the light of pro-environmentalism or environmental friendliness), environmental efficiencies (improvement, potential or otherwise in environmental management aspects), societal pressures/influences (influences arising from social groups in the organisation's external environment, including other organisations) and regulation (regulatory and legal pressures, desires to comply and failure to comply).

The way an organisation perceives environmental performance should have a substantial impact on how it measures the extent to which it is achieving intended performance levels. The setting of performance criteria and the selection of indicators should both reflect organisational priorities and opinions of performance.

Subsequently, the main perceptions shaping respondents views of environmental performance (environmental impact consciousness, environmental efficiencies, societal pressures/influences and regulation) as reported in this research should be directly reflected in the selection and measurement of performance through indicators by these organisations. This would be typically demonstrated through the use of management performance indicators (MPIs), more appropriate for measuring the main environmental performance perceptions held by respondents. However, results from Chapter 7 reveal that more respondent organisations measured environmental performance indicators (EPIs) such as water and energy consumption than MPIs such as number of environmental ideas of employees. The identification of methods for ascertaining individual organisational environmental performance perceptions, and selecting correlating performance indicators presents an opportunity for further research.

# CHAPTER NINE

# CONTRIBUTION TO KNOWLEDGE, RECOMMENDATIONS AND FURTHER RESEARCH

## 9.1 Contribution of the study to knowledge

The FACES model addresses gaps created by the existence of several different categorisation models reporting on and describing EMSIFs of pro-environmental behavior. The model brings consistency into the interpretation of EMSIFs and reduces differences, variations in interpretation, repetition and disparity in EMSIF description (Darnall et al., 2008; Gonzalez, Sarkis & Adenso-Diaz, 2008; Heras & Arana, 2010). The FACES model also contributes to clarifying differing views of environmental performance recorded in previous studies (Bellesi et al., 2005; Perotto et al., 2007; Darnall et al., 2008; Hertin et al., 2008; Massoud et al., 2010). The model was used to develop subject themes around which environmental performance could be viewed, and which explain ways in which organizations perceive the concept of environmental performance.

Furthermore, by developing an EMSIF categorisation model, this study provides a practical means by which future research(ers) may classify, interpret, and analyse EMSIFs in organisations across world regions and industry sectors. The effectiveness of the FACES model in analysing EMSIFs across economic and geographic boundaries has been demonstrated within this research. Sections 4.5.8 and 4.5.9 of this thesis show the existence of trends in pro-environmental behaviour across organisations in different geographic and economic regions. This confirms the speculation of previous studies such as Darnall et. al (2008). This area of research requires further study using the FACES model as a research tool.

The ability to clearly assess EMSIFs affecting organisational pro-environmental behaviour enables the understanding of challenges and factors influencing organisations behaviour in this area. This presents important value, instrumental in the creation and fostering of conditions conducive for encouraging further pro-environmental behaviour, as well as addressing its barriers in organisations. The development of enabling, conducive conditions

for organisations to demonstrate pro-environmental behaviour is of primary importance to policy making initiatives, which must focus on encouraging organisations to reactively and proactively make decisions than benefit the natural environment. Conducive conditions range from the development of regulatory incentives for encouraging and rewarding pro-environmental behaviour, to capacity and awareness-building initiatives for organisations and the provision of support and resources to promote pro-environmental behaviour (Bansal & Bogner, 2002; Boiral, 2011).

By presenting an analysis of data that furthers an understanding of organisational views of environmental performance and EPI use in organisations, the study provides clarification in the understanding of environmental performance, while suggesting more appropriate indicators by which it may be measured. The FACES model can also be used as an important tool in the development of environmental performance indicators which reflect organizations views on performance as well as all the factors which influence pro-environmental behavior.

Research knowledge providing a more realistic understanding of perceptions shaping environmental performance should bring about performance optimization in organisations. This study, by being situated in a developing country setting, furthers the understanding of pro-environmental behaviour in less developed world regions, where studies have been few. Environmental management research is of particular value in these regions where environmental problems are severe and proactive approaches to environmental challenges are required (Massoud et al., 2010).

## 9.2 Potential beneficiaries of the research

The outcome of this research benefits the following groups:

1. Foreign and local certification bodies: This study will provide access to information on EMSIFs, as is impacted by pro-environmental behaviour.
2. Organisations aspiring to formal EMS implementation and certification: This research provides a subject-matter reference and guide in the development and successful implementation of EMSs.

3. Environmental Regulatory Bodies: Nigerian environmental regulatory bodies such as the Federal Ministry of Environment, the National Environmental Standards and Regulatory Enforcement Agency, the Department of Petroleum Resources and State Environmental Protection Agencies will better understand the nature, applicability and gains of pro-environmental behaviour in organisations.
4. Environmental Policy Formulators: Knowledge of EMSIFs affecting organisations will give policy formulators a better understanding of the enabling environment that needs to be created to improve pro-environmental behaviour in organisations worldwide and across industry sectors.
5. Organisations with a developing country focus - International organisations with operations in developing countries, local organisations, certification bodies, environmental regulatory bodies and policy formulators specifically focused on developing countries will benefit from understanding implementation factors specifically affecting these regions.
6. Academia and International and Local Knowledge Banks: The academic and international communities will benefit from additional empirical research knowledge on the impacts of pro-environmental behaviour on organisations in developing countries.

## 9.3 Recommendations

The following are practical recommendations made as a result of this research work:

**a. FACES Model Analytic and Diagnostic Tool** – The FACES model should be used to develop a diagnostic tool which may be used by government environment ministries and regulatory agencies to profile EMSIFs affecting pro-environmental behaviour in organisations on an industry-by-industry basis. The diagnostic tool can be used to profile organizational behaviour across industry sectors, geographic location or economic classification, by eliciting information on EMSIFs and categorising them into FACES quadrants. The use of the tool to identify EMS drivers and benefits will reinforce the promotion of enabling conditions to encourage more pro-environmental behaviour. Furthermore, the identification of EMS barriers will help regulatory agencies address challenges hindering pro-environmental behaviour.

Employees of these agencies should be provided training on the model and its components. Results obtained using such a diagnostic tool will also help organisations themselves gain a better understanding of their pro-environmental behaviour.

**b. Development of Pro-environmental Behaviour Support Documentation** – To encourage organisations towards compliance with regulations, environmental regulatory bodies operating in developing countries (such as those mentioned in this research) should compile, publish and distribute documents detailing the drivers, benefits and barriers to pro-environmental behaviour in organisations. The contents of this thesis would be an important input into proposed publication material. To increase the effectiveness of such documentation, an industry-by-industry perspective should be adopted, furthered by giving organisations the opportunity to freely contact regulators for additional guidance or explanatory information on complying with regulatory stipulations. The development and dissemination of such documentation will serve to augment the typical command and control approach adopted by regulators in developing countries with a more supportive and participatory approach.

**c. Regulator-Organisation Engagement** – Environmental regulators in developing countries should set up forums where they can regularly meet and share information with organisations. Such forums should be used as a medium to address barriers and challenges to organisations' display of various pro-environmental behaviours.

**d. Setting up a Knowledge Management Support Network** – A network of organisations in developing countries, which have consistently and successfully demonstrated pro-environmental behaviour such as implementation of EMSs, should be set up to document and share their experiences with other organisations through mediums such as chambers of commerce, manufacturing associations and trade associations. Such initiatives should be set up on a country-by-country basis, so that country specificities in pro-environmental EMSIFs are represented. If feasible, an industry-by-industry perspective could also be adopted in the development of such support documentation. Similar initiatives have been undertaken in Germany, where case studies of successful EMS implementations have been documented and shared by the chamber of commerce and industry associations (Babakri et al., 2003).

**e. Pro-environmental Behaviour Rebates –** Government/regulatory agencies should offer rebates to organisations displaying specific pro-environmental behaviours. This would serve to address main challenges to the display of pro-environmental behaviours identified in this research, specifically 'cost of implementation/budget barriers' and 'lack of resources'. Such rebates would be in the form of reduced tax in goods/services procurement, importation and exportation, tax exemptions and free access to government training schemes. Rebates could also be in the form of regulatory relief, for example fewer visits or inspections by regulators, and could include cost reduction incentives especially if regulatory inspections attract an administrative fee. In particular, small organisations more likely to be sensitive to the costs of displaying pro-environmental behaviour will benefit from rebates such as cheaper access to loans through government-sponsored schemes. Governments and regulatory bodies can also improve the low EMS certification rates in developing countries by offering similar rebates to successfully certified organisations. Regulatory bodies should work closely with certification bodies to provide literature to organisations on the process and benefits of EMS certification.

**f. Use of Supplier Relationships –** Pro-environmental behaviour in small to medium organisations can be impacted greatly through the use of client-supplier relationships. Governments and regulatory agencies should partner with principal organisations within each industry sector, influencing them to require specific pro-environmental demonstrations (development of environmental policies and goals, risk assessments, environmental training and use of EPIs) from suppliers. Regulators should set up a monitoring system by which each organisation's suppliers' environmental records and progress is monitored. Complying organisations that allow access to their suppliers should be given rebates in the form of tax exemptions. This approach will produce the benefit of getting smaller, nondescript organisations to display pro-environmental behaviours, while also improving relationships between larger organisations and regulatory bodies.

**g. Top Management Forums** – 'Lack of top management commitment' was one of the top 5 barriers to pro-environmental behaviour as reported by this research. Research institutions in developing countries (or international developmental institutions funding projects in developing countries) should communicate the sample costs vs. benefits of different pro-environmental behaviour initiatives such as EMS implementation to top management officials

of organisations. Top management, if presented with explicit cost-benefit implications of pro-environmental behaviour, are likely to pose fewer challenges.

**h. EPI Awareness** – 10% of surveyed organisations indicated that they did not use any EPIs at all. Chapter 6 also reports disparities between organisations perceptions of environmental performance and the EPIs they use to measure performance. Organisations, especially those operating in developing countries, need to be made more aware of the existence and application of EPIs. Industry or trade associations in partnership with certification bodies should develop and deliver short training programs to enlighten environmental personnel on the meaning and use of EPIs. Particular emphasis should be put on the selection and use of MPIs in measuring environment management indices. Information on EPIs should be put in a suitable form for dissemination to smaller organisations that may not actively belong to industry or trade associations.

## 9.4 Further research work

Future opportunities exist for conducting research in further analysis of EMSIFs using the FACES model across more current and future studies. This will further demonstrate the model's usefulness in analyzing EMSIFs across geographical, economical and functional boundaries, and investigating the relationship between EMSIF perceptions and organisational characteristics in developing country organisations. It will also demonstrate the usefulness of the model in investigating relationships between organisational characteristics and organisations' level of environmental management in developing countries, and in comparing how organisations rate 'non-EMS' benefits (e.g. better customer loyalty) derived from pro-environmental behaviour against EMS benefits (e.g. reduced environmental incidents).

Future research opportunities also exist in investigating the nature of relationships between organisations' characteristics (such as size, turnover and industry) and EPI use. It would also be useful for research to be conducted in determining reasons for the use of or preference for OPIs over MPIs, and as well as determining possible organisational trend relationships within this preference (Henri & Journeault, 2007; Perotto et al., 2007).

From previous studies, it is unclear whether the pro-environmental behaviour in the form of implementation of EMSs has a tangible effect on environmental performance (Nawrocka & Parker, 2008). Though studies have reported some improvement in performance after organisations effected environmental change, improvements may have been as a result of EMS implementation directly or simply due to upgrades in operational efficiency. Organisations may remain unaware of changes in performance levels, as the definition of environmental performance is complicated by the contradictory results of available literature on its relationship with EMS implementation.

Only a small proportion of studies addressing EMS and environmental performance have discussed the quantitative, objective and tangible effects of implementing EMSs on specific aspects of environmental performance, instead focusing on more generalizable impacts, usually based on in-company respondent-supplied information, which the implementation of EMS features have brought about (Franchetti, 2011; Hertin et al., 2008; Heras & Arana, 2010). A few studies have focused on the impact of EMS implementation on single aspects of environmental performance, and though this approach may lead to more generalisable results (Comoglio & Botta, 2011), it does provide objective evidence of the impact of EMS implementation. Subsequently, future research should focus on establishing a relationship between pro-environmental behaviour and environmental performance, and in particular identifying if pro-environmental behaviours like EMS implementation impacts environmental performance positively or negatively (Lopez-Fernandez and Serrano-Bedia, 2007). Results of previous research on the connection between EMS and corporate environmental performance are inconclusive. More research on determining the link between pro-environmental behaviours like EMS implementation and performance improvement is required, to clarify the impact of pro-environmental behaviours on performance. Such research should be focused on determining means by which organisations may identify environmental performance measurement approaches best suited to their specific realities, operations and pro-environmental behaviour motivations. Further research should also be carried out on a more extensive scale in determining what organisations views of environmental performance are. Studies based in multiple countries with distinct degrees of culture may produce new insights in this research area.

# CHAPTER TEN

# CONCLUSION

## 10.1 Objectives 1, 2, 3, 4 & 5 (Refer to Section 1.2)

Organisations are affected by several factors which determine the extent to which they display pro-environmental behaviour. The FACES model was developed as a part of this research work to better identify, categorise and analyse factors affecting pro-environmental behaviour in organisations. The model was used to evaluate pro-environmental factors identified through a structured survey of respondent organisations in a developing country setting.

This study revealed that respondent organisations were influenced by different factors (drivers, benefits and barriers) that affected their display of pro-environmental behaviour. Study results also revealed that organisational characteristics (size, industry, turnover, geographic location, corporate structure and ownership structure) had an influence on the way these factors informed pro-environmental behaviour.

## 10.2 Objectives 6, 7 & 8 (Refer to Section 1.2)

Improved environmental performance is the goal of all organisations seeking to display various forms of pro-environmental behaviours. However, research studies have found it difficult to establish direct causal links between forms of environmental behaviour and an improvement in environmental performance. Greater clarity is needed in defining what is meant by environmental performance to begin with.

This research has shown that environmental performance cannot be universally defined, but is instead interpreted in the light of individual organisational motivations and perceptions. Respondent organisations were also found to measure environmental performance indicators that did not fully reflect their perceptions of environmental performance. To ensure that they are achieving intended goals of pro-environmental behaviour, organisations must identify their

specific interpretations (definitions) of environmental performance, and select appropriate metrics for measuring performance.

Several further research opportunities exist as a corollary to this work. They include using the FACES model to assess EMSIFs across more current studies. Of interest would be the use of the FACES model in studies identifying and evaluating pro-environmental behaviour in organisations in developed and emerging economies. Research opportunities also exist in investigating the nature of relationships between organisations characteristics (such as size, turnover and industry) and EPI use, determining what organisations views of environmental performance are and determining means by which organisations may identify environmental performance measurement approaches best suited to their specific realities, operations and pro-environmental behaviour motivations.

Recommendations as a result of this research include but are not limited to: the development of a FACES model diagnostic and analytic tool, the development and distribution of pro-environmental behaviour support documentation for use by organisations, improved regulator-organisation engagement, setting up of a knowledge management network for organisations, and the use of supplier relationships to promote pro-environmental behaviour.