REVIEW OF ENVIRONMENTAL TRAINING PRACTICES IN SELECTED BUSINESSES IN DURBAN

Submitted in fulfilment of the degree in Master of Science: Environmental Science. Discipline of Geography in the School of Agricultural, Earth and Environmental Sciences in the College of Agriculture, Engineering and Science of the University of KwaZulu-Natal

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ABSTRACT

Environmental management has moved from a policy concept to a proactive strategy defining business responsiveness to stakeholder and market-related pressures for more environmentally sustainable business practices. Paradoxically, the financial benefits accrued to businesses at the often externalised expense of environmental goods and services, is the very advantage that best positions it to respond to the environmental crisis. The importance of a systematic and proactive environmental response from the business community is compelled by the fact that environmental impacts are predominantly caused by errant pollutant and non-compliant business activities which is increasingly regulated through South African environmental legislation. The business response through corporate sustainability and environmental management is considered a sweeping change to business as usual. Increasing environmental regulations make the adoption of environmental management systems such as ISO 14001 more commonplace. In adapting to these changes in the workplace, it makes environmental training and awareness of employees a material avenue of investigation which further directs the aim of this study. In applying the ISO 14001 certification criterion, through a purposive and non-probable sampling technique, twenty-four (24) Durban businesses have participated in this study. Similarly, in addition, fifteen (15) employees undergoing environmental training along with five (5) other role-players and stakeholders that relevantly bear on environmental training practices participated in this research, which was conducted through the use of survey questionnaires. The extent of adoption of environmental training and its effective reach across company structures has been assessed against seven (7) developed environmental training principles of this study. The selected businesses and other respondents in Durban show keen awareness, attitudes and perceptions regarding environmental training. Environmental training is a widely practiced activity across all the businesses sampled with topic coverage focussed predominantly on waste management, hazardous chemicals, and environmental auditing. The environmental training activities are largely combined with other Safety and Health priorities. Whilst this has no perceived negative impact on the content of environmental training, there is an indication that environmental training budget allocations are not effectively prioritised in combination with other training activities. The implementation of training across the company tiers shows executive levels in need of greater exposure to this activity. While the respondents predominantly showed limited satisfaction with environmental training received, various areas of improvement became clear such as greater management commitment, greater institutional assistance for clarity of training standards, course offerings and inter-industry collaboration in environmental training.

PREFACE

This thesis was completed at the University of KwaZulu-Natal, in the School of Agricultural, Earth and Environmental Sciences between March 2014 and June 2015 under the supervision of Dr Michael Gebreslasie. The work contained in this thesis is my own, and where the work of other authors has been used, it has been acknowledged accordingly. This dissertation has not been submitted in any form for a degree to any other University.

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DECLARATION 1 - PLAGIARISM

I, DIANNE SENNOGA, declare that:

1. The research reported in this thesis, except where otherwise indicated, and is my original research.

2. This thesis has not been submitted for any degree or examination at any other university.

3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.

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5. This thesis does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the thesis and in the References sections.

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ACKNOWLEDGEMENTS

"Things won are done, joy's soul lies in the doing" William Shakespeare

There are many efforts that supported the completion of this work. There is heartfelt appreciation to my supervisors Dr Gebreslasie and Dr Ahmed, for firstly seeing the potential of this area of research and for providing the necessary support to assist me in its completion.

I am also full of gratitude for the patience, prayers and encouragement of my family and friends especially during the often long periods of absence as I worked on my thesis. There are no words sufficient enough to thank my husband Fred Sennoga for his unrelenting patience, encouragement and support. I am ever grateful for his listening ear and broad shoulders to lean on, along with the many midnight coffee-breaks and treats.

Finally, I am in awe of God and how He has orchestrated and directed my every step in this journey. He truly has shown me once again that all things are possible with His strength, a strength that I am wholeheartedly grateful for above all else.

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ACRONYMS

COP17	17th Conference of the Parties
BRICS	Brazil, Russia, India, China and South Africa
CDP	Carbon Disclosure Project
DAEA	Department of Agriculture and Environmental Affairs
DCCI	Durban Chamber of Commerce and Industry
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DHET	Department of Higher Education and Training
EMP	Environmental Management Plan
EMS	Environmental Management System
EIA	Environmental Impact Assessment
HCDS	Human Capital Development Strategy
ESSP	Environmental Sector Skills Plan
ETA	Environmental Training and Awareness
GDP	Gross Domestic Product
GGEI	Global Green Economy Index
GHG	Greenhouse Gas
GRI	Global Reporting Index
HRM	Human Resources Management
IDC	Industrial Development Corporation
IEM	Integrated Environmental Management
IPAP2	Industrial Implementation Action Plan
ISO	International Standards Organisation
JPOI	Johannesburg Plan of Implementation
JSE	Johannesburg Stock Exchange
MDG	Millennium Development Goals
NDP	National Development Plan
NBI	National Business Initiative
NSDP	National Development Skills Plan
NEMA	National Environmental Management of Act
NEPA	National Environmental Protection Agency
NQF	National Qualifications Framework
NSSD	National Strategy for Sustainable Development
NGO	Non-government Organisations
PES	Proactive Environmental Strategies
QCTO	Quality Council for Trades and Occupations
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environment and Quality
SETA	Sector Education Training Authority
SEDA	Small Enterprise Development Agency
SAQA	South African Qualifications Authority
SARI	South African Renewables Initiative
SARS	South African Revenue Services
SDCEA	South Durban Community Environmental Alliance
SPES	Strategic Plan for the Environmental Sector
SDG	Sustainability Development Goals
SRI	Sustainability Reporting Index
UN	United Nations
UNCED	UN Conference on Environment and Development

UNCHE	UN Conference on Human Environments
UNCSD	UN Conference on Sustainable Development
UNEP	UN Environmental Programme
UNFCCC	UN Framework Convention on Climate Change
WCED	World Commission on Environment and Development
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation

CHAPTER ONE: INTRODUCTION

1.1 PREAMBLE

Globally, it has become increasingly urgent to address the evident challenges between economic growth and environmental sustainability, which has been the subject of much debate and discourse in recent decades (Elkington, 1989; Owen and Unwin, 1997). A notable shift in thinking has been the idea that environmental management in tandem with capitalist corporate growth can be achieved in a sustainable manner. This has broadly been the contribution of the ecological modernisation discourse (Hajer, 1995; Poncelet, 2004). Ecological modernisation has practically led to an optimistic understanding in terms of the compatibility and mutually beneficial interaction between business and environmental sustainability, wherein reformist, as opposed to radical action is envisaged (Dryzek, 1997; Orsato and Clegg, 2005). Key to this idea is the consensus that the environment can be managed through the use of cleaner technologies and management systems (Oelofse *et al.*, 2006; Pataki, 2009). In so doing, business can benefit in terms of risk reduction, profit widening, brand improvement, and competitive advantage (Pojasek, 2010). Ecological modernisation often considered a synergistic ally to sustainable development within a neoliberal and market driven society, is not without significant critique and shortcomings in failing to address social inequities or lacking in substantial reform impetus for the ecological task at hand (Buttel, 2000; Cohen, 2006). Green washing and co-opting by big business of the environmental dialogue and contestations between civil and government groups, remain significant stigma in the promotion of ecological modernisation strategies (Oelofse *et al.*, 2006).

Inasmuch as business can no longer avoid the call to adapt to environmentally responsible change, this change is encouraged within a highly contested terrain. For example, Smart (1996:53), argues that perilous environmental problems are not exclusively caused by capitalistic growth instead these problems "can be solved by a common-sense alliance of business, government and environmentalists. Among these, only business has the resources of technology, finance and organisational competence to implement the necessary changes." Political, economic and philosophical ideologies often conflict with ecological imperatives. For example, in the economic sphere, Anderson and Leal (2005: 212) arguing from an anthropocentric perspective for alternative market based environmentalism, dismiss the intrinsic value motive for securing environmentally responsible business behaviour in favour of

individual-motivated business decision making that will ultimately produce the demanded ecological goods for society. The philosophical ideology that counters this, known variously as ecocentricism, asserts that nature has intrinsic value and strongly opposes the value traditions of anthropocentric politics and economic logic that "sanction the domination of nature" essentially creating the ecological crisis at hand (Eckersley, 2005: 364). However,Eckersley (2005: 365) emphasises that these philosophical traditions and their preoccupation on differences are a foolhardy exercise better reserved for exploring more pragmatically the political resolve through 'nature advocacy' within existing democratic polities coined as "green political theory". The previously named South African Department of Environmental Affairs and Tourism (DEAT) confirms that amidst the growing body of South African legislative requirements for environmental compliance, companies have widely been encouraged to adopt Environmental Management Systems (EMS) as part of establishing an Integrated Environmental Management (IEM) tool (DEAT, 2004). In so doing, a systematic process for meeting minimum legal requirements and addressing broadly the necessary steps to achieving an environmentally sustainable business becomes seemingly more achievable. The widely adopted International Standards Organisation (ISO), namely ISO 14001 is a prominent example of such an EMS (World Bank, 2000). Importantly, environmental training and awareness is a requirement as part of the iterative implementation and operation stages of the ISO 14001 EMS (ISO, 2004).

Although, an EMS is a voluntary mechanism to ensure compliance to legal requirements, public as well as corporate competitive pressure, have in recent years made environmental sustainability mandatory (Pojasek, 2010). South African business has responded to the call for environmental sustainability evidenced by, but not limited to, the adoption of voluntary ISO 14001 certification processes for example. South Africa is among the top three African countries to have significant certification (World Bank Policy Research Report, 2010).Durban is an economically vibrant city, and supports a major portion of the eThekwini's municipal national Gross Domestic Product (GDP) contribution of over 10% to South Africa's economic output (eThekwini Municipality, 2006b). Durban is a port city, representing an important gateway to the country's import and export industries as well as manufacturing, transport, retail and financial service sectors (eThekwini Municiplality, 2014). These factors broadly make for a discerning geographic locale in which to further research the extent of corporate environmental sustainability practices.

Environmental training and awareness is one of the key stages in a robust EMS as it forms part of the iterative process of improvement and increased environmental performance (ISO, 2004; Prakash and Potoski, 2006;Testa *et al.*, 2014). With the changing environmental legislative and regulatory context in South Africa, it is imperative that adequate capacity building investment within business occurs(Davis, 1991; Orr, 2012). Furthermore the move to integrate environmental sustainability efforts into business strategy is strongly promoted to effect internal business environmental innovation and environmental legislative compliance (Freemantle, 2008). Porter and Van de Linde (1996), asserts environmental issues have historically been dealt with as an outsourced, end-of-pipe strategy to meet minimum compliance requirements and this is counterproductive to meaningful and effective environmental change required of businesses. Instead an integrated approach is promoted that requires management leadership and ownership of environmental performance and employee buy-in to effectively roll-out, adapt and innovate within the changing environmental requirements of doing business (Halme, 1997; Fourie *et al.*, 2012). For example, such integration of environmental performance reporting with traditional business reporting is strongly promoted in South African businesses through the sustainability reporting initiatives such as King III, the United Nations (UN) Global Compact and the Global Reporting Index (GRI) which is a compelling challenge to employers to recognise that a financial focus alone is a limited view of business performance (Fourie *et al.*, 2012; Roberts, 2012). The notion that environmental management is considered change management, is negotiated through concerted environmental training such that the entire company embrace a learning organisation culture towards environmental management, is supported by several studies(Davis, 1991; Pall and Welford, 1997; Welford, 1998; Jimenez and Lorente, 2001). It is also argued that effective risk management is an employee-centred strategy that strongly influences much needed employee buy-in to get involved in effectively enacting a sustainable and risk minimising EMS(Mentis, 2010). This integration of environmental priorities into business activities through environmental training can overcome the innovation resistance in business often due to ignorance of the companies environmental priorities and changes (Porter and Van de Linde, 1996). Businesses are at the forefront of environmental impacts, thereby necessitating that employees and management engage in environmental training and awareness to effect meaningful change in promoting environmental best practice through corporate culture and values (Sakr *et al.*, 2010).The key to maintaining continuous improvement as espoused in an EMS is to not confuse the use of innovative technology as the solution to better environmental performance but it is rather an output of a well-managed team of dedicated and informed

employees that can "identify, prioritise and evaluate environmental opportunities" (Bavaria, 1996: 54).

1.2 RATIONALE FOR THE STUDY

The enduring environmental conflicts that roused civil outcry in the 1960's and 1970's were primarily around the issues of errant pollutant industrial activities (Poncelet, 2004). In particular Rachel Carson's *Silent Spring*, ignited an apocalyptic narrative in environmental advocacy (Killingsworth and Palmer, 1996; Gupta, 1998). This persistent conflict between the protection of the environment and the need for economic growth has spawned a proliferation of literature and societal interest (Dryzek, 1997; Lafferty, 1998; Fuggle and Rabie, 1999). A broad and constantly evolving debate, compatible economic growth and environmental longevity and protection had its defining start in the ideas presented on sustainable development in the Brundtland Report in 1987 following the World Commission on Environment and Development (WCED) (WCED, 1987; Gupta, 1998; Mawhinney, 2002).

Sustainable development has proved both an elusive and indispensable construct in bridging the gap between economic development and environmental protection (O'Riordan and Voisy, 1998; Mukhurjee and Kathuria, 2006). The development and environmental gaps resulting from immense social inequalities and environmental negligence require action on the ground, in a practical and decisive manner to close such gaps (O'Riordan and Voisy, 1998; Christie and Warburton, 2001). As business is the main agent for bringing about development and socio-economic change, it consequently carries a substantial burden for environmental change(Davis, 1991).

The interface of interaction with historically dire environmental and social inequities with economic development within the capitalistic and neoliberal paradigm, places a specific set of challenges on business as usual. As Siebenhüner and Arnold (2007: 340) succinctly state, "companies trying to implement sustainable development find their conventional operations fundamentally challenged." However, therein lays much opportunity as sustainability offers a means of change by integrating best practice and new modes of sustainability into business thereby aspiring in practical terms, to integrate economic, social and ecological imperatives (the triple bottom line) (Blackburn, 2008). While other authors assert that this is a challenging task, it is a well located one as business controls much of societies technological and

productive capacity, therefore change and innovation also lie within its grasp and businesses are in a position to effect meaningful environmentally sustainable change (Gupta, 1998). In addition, Mammatt (2012) asserts that sustainability is probably the most urgent conversation businesses can have due to the inextricable links between business operations' longevity and ecosystem sustainability. The business response to this change is positioned within broader business priorities that can be considered as enlightened self-interest as opposed to an altruistic or intrinsic moral sense of corporate responsibility although the framing of the latter context is often used (Hanks, 2012). This self-interest is particularly important as a motivator to reducing perceived risks posed by environmental legislation and regulation, penalties and taxes, operational disruption and corporate reputation (Freemantle, 2008). Managing risk is an important subset of the corporate challenge to embrace sustainability while in balance seeking the opportunities provided in this change to business as usual. These opportunities can arise through operational resource efficiency, building reputational capital and securing value creation opportunities through competitive advantages (Hanks, 2012).

The question arises as to whether companies are doing enough or merely green washing rather than pursuing an authentic sustainability response. Many authors agree that much is to be done in this area and that pivotal launching of effective corporate sustainability is to incorporate the sustainability challenge into core business strategy and not as an adjunct or once-off compliance exercise (Welford, 1998; Sneddon *et al.*, 2006; Staib, 2009; Hawken, 2012). A commonly expressed approach is to integrate business functions across the company along the lines of a comprehensive EMS such as ISO 14001 (Zackrisson *et al.*, 2004; Prakash and Potoski, 2006). Giles (2008), for instance, elaborates that a company's EMS is a starting point for achieving environmentally sustainable business performance and stresses that no management system however well designed can be effective without improving the ability of the employees and management toward environmentally aware decisions and behaviour. A company's EMS is thus only as good as the people that implement, innovate and internalise environmental action. Further, Sakr *et al.* (2010), advocates the adoption of best practices throughout the different tiers of the corporate structure in raising awareness of environmental issues and impacts. The urgency to conduct business sustainably cannot be ignored, and there is therefore a great need to ensure that businesses are capacitated and informed to innovate and engage with the changing environmental pressures (Clayton and Radcliffe, 1996; Owen and Unwin, 1997).

There is a large body of work presented within corporate sustainability, managing sustainable development and the call for businesses to innovate and conduct sustainable business as good corporate citizens (Davis, 1991; Levy, 1997; Pall and Welford, 1997; Paton, 2000; Smith and Pangsapa, 2008). However, there is consensus and growing interest in academic contributions that environmental training and awareness is a critical stage in managing businesses' ability to innovate and perform within environmental best practice (Welford, 1998; Smith and Pangsapa, 2008). Environmental training is recognised as a crucial element of environmental performance within the integrated management and environmental management systems rhetoric (Cairns and Crawford, 1991; Owen and Unwin, 1997; Sadgrove, 1997).

1.2.1 Significance of the research

Despite the plethora of corporate sustainability and environmental training contributions globally, there are, according to available resources, only two distinct South African academic works that expound specifically on environmental training practices (Craffert and Fourie, 1997; Mabunda, 1998). Craffert and Fourie (1997) researched the environmental training practices of industry across South Africa whilst Mabunda (1998) in an unpublished thesis, investigated two industries within the Eastern Cape of South Africa. Both studies revealed the emergent trend of environmental training within industry, and the severity of inadequacy in the endeavour. From this initial review there appears to be a paucity of literature specifically elaborating on environmental training, key attributes and specific outcomes of training in the South African context. This presents an opportunity to elaborate further on the extent and nature of such training within actual businesses in an economically active metropolitan city as Durban. It is envisaged that the contribution of this research will add to the growing interest in environmental training and its importance in being an engine to drive change and innovation within businesses to improve environmental performance and promote sustainable business practices in a local context. Environmental training has been correlated positively with environmental performance (Zilahy, 2003). Therefore a study into the local context of this assertion is an important contribution to the environmental management and corporate sustainability rhetoric.

1.3 AIM OF THE STUDY

The aim of this research is to review the environmental training and awareness practices within selected Durban businesses.

The business arena vitally intersects with environmental impacts within a city and it is therefore imperative to investigate the basic environmental knowledge and performance practices established through environmental training that inform these businesses and their activities. Understanding the environmental training in this context will reveal practices that are supported by particular employee and management perceptions, attitudes and commitment of resources towards environmental training activities.

1.4 OBJECTIVES

The objectives of this research include the following which direct the course of the undertaken investigations of this study:

1. To investigate the extent of environmental training and Awareness (ETA) within Durban businesses

   Durban is considered a bustling and vibrant metropolitan city and within this context business activities within Durban provide a fertile ground of research. The specific spatial and regional context of Durban lends great opportunity to contextually examine its business activities and environmental practices specifically in terms of environmental training.

2. Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.

   Effective training is ideally a company-wide activity and more than an activity is should be embraced in an organisational culture of learning. This is often best indicated by the how widespread the environmental training reach is within a company.

3. The perceptions of company management and relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation

   Attitudes and values are key drivers in enabling a rigorous environmental training and learning culture. Identifying the perceptions of company management can indicate the weight of value placed on environmental training.

4. Develop a set of ETA principles to evaluate the ETA practices

   ETA is a relatively new addition to the complement of training materials deemed pertinent to corporate performance in the past decade. There is therefore a decidedly significant information gap regarding this particular practice. What therefore becomes expedient is to clarify what might be guiding principles that will elucidate best practice as a benchmark which can be useful to assessing the results of this study.

1.5 SCOPE AND LIMITATION OF THE STUDY

The scope of this study is delineated by the ISO 14001 certified business participants available in Durban within the eThekwini municipality. While there is a keen focus on corporate sustainability and the advantages of environmental education and training, this research is not aimed at investigating the impact of environmental training on corporate profitability nor is it attempting to address issues specifically or broadly related to the discipline of environmental education. This study is instead positioned within the environmental management discourse and will examine environmental sustainability outcomes achieved through environmental training and awareness. The methodology employed to investigate the specific aims of this research and its possible limitations are further detailed in Chapter four.

1.6 CHAPTER OUTLINE

Chapter two expounds on the conceptual framework of this research which is positioned within the contributing influences of environmental training through sustainable development, environmental management and ecological modernisation. In addition, the voluntary market mechanisms of environmental management systems through the implementation of ISO 14001 within the corporate environmental management context, is examined further. Chapter three examines the specific institutional and legislative arrangements that underpin environmental training. Also discussed is the national policy drive to mainstream environmental skills in the workplace in addition to the ethical traditions that motivate an environmental ethic in sustainable business practices. Specific organisational factors that enhance environmental performance and the effectiveness of environmental training in the workplace are also elaborated. Chapter four presents the background to the study and methodology of the research. The study area of Durban is examined and the chapter contextualises its socio-economic and environmental priorities. The methodology is described as a mixed-methods research approach which is undertaken as a phenomenological and exploratory study into environmental training

practices in Durban. Chapter five presents the results and discussion of the research within the context of the aim and objectives of the study earlier outlined. Chapter six presents the summary of the main findings, interpreted within the set objectives and developed environmental training principles. Based on this discussion, recommendations are presented followed by the conclusion.

1.7 CONCLUSION

The growing challenges of integrating environmental considerations into business priorities necessitates the incorporation and inclusion of environmental best practice knowledge and training across the company spectrum of board members to employees in order to effectively implement and engage with the changing legislative and stakeholder pressures for environmentally sustainable business practices. Environmental sustainability is perhaps the most urgent conversation businesses can have as it is fast becoming the determining factor for business longevity and the health of the ecosystem it depends on. The wide spanning topics of cultural adaption and learning organisations have been alluded to in this chapter as intrinsic ingredients to adapting to the changes brought about by environmental demands. These topics will be explored in greater depth in the following chapter that explores the conceptual framework underpinning environmental training.

CHAPTER TWO: CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

Businesses are at the forefront of the changes needed to secure a viable and liveable earth for present and future generations. The sweeping and inter-generational topics that underlie the motivation for businesses to do so, as well as how they can pragmatically approach this mammoth challenge, are explored in greater depth in this chapter. This chapter also looks specifically at the emergence of and underlying impetus for the sustainable development ideology that is today as synonymous a term in organisational and industrial activities as the democratic institutionalism that gave rise to it. Sustainable development remains an important guiding principle as succinctly stated by one author that, "ultimately sustainability is perhaps the most important and urgent conversation we can have in our organizations. It has two equal parts: one is letting go of the illusion – understanding which parts of our modern economy and society cannot last forever and why. The other is deciding what really matters to us and working out how we will build a fresh economy and society around these values" (Willis, 2012: 1).At the business level the emergence and dominance of environmental management and related themes such as IEM, EMS and ISO 14001 EMS are examined and discussed in critical detail. Furthermore these topics are incompletely explored without a critical examination of the driving philosophy of sustainable development and environmental management, that is, ecological modernisation

2.2 SUSTAINABLE DEVELOPMENT

2.2.1 Changing Notions of Sustainable Development

Sustainable development has become a buzzword embracing an ideology as politically, and institutionally embedded in our globalised society to be as morally, economically and socially imperative as democracy itself (Lafferty, 1998; D'Souza, 2002). It is a highly contested idea that is often incongruent to the ideals it represents (Dylan, 2012; Allenby, 2012). It is challenged by the often conflicting development and social priorities. Brown (2011) for example, cautions that priorities at global and national scales will worsen in an increasingly warmer earth, with finite tradable resources, and deteriorating earth systems to sustain increasing economic and social demands. In addition, Dylan (2012) argues that in many respects, sustainable development is an outdated idea and given the urgency of environmental

collapse, more radical measures are required to engage with the urgent changes needed. However, several authors view sustainable development as a unifying concept for global harmony and attaining the triple bottom line and is therefore a concept in need of revitalizing and not removal (Morrow and Rondinelli, 2002; Ciegis *et al.*, 2009; Brown, 2011). On an optimistic note, Martin *et al.* (2011: 2) states that, "sustainable development gives us a new way of thinking through and managing human impact on the world – one that can generate long-lasting positive results for the greater benefit of human societies".

The history of sustainable development as a concept and as a regime has proliferated from an increasing global platform through various negotiated consensus based conferences established by the UN to tackle a constantly evolving global dilemma of abating environmental destruction amidst socio-economic disparities, not least of which is exacerbated by continuing socio-economic inequities of global North-South realities (D'Souza, 2002; Wagner, 2007; Wagner, 2013; Danilov-Danilyan, 2014). There have been several UN sustainable development conferences in the past three decades, where the milestone conferences include:

- The 1972 UN Conference on Human Environments (UNCHE) in Stockholm Sweden.
- The 1987 UN-established World Commission on Environment and Development (WCED, 1987)
- The iconic 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro, and
- The most recent UN Conference on Sustainable Development (UNCSD) in 2012 held again in Rio de Janeiro, coined as Rio+20 (D'Souza, 2002; Wagner, 2013).

The fora of globally attended UN conferences have shown an increasing intensity and complexity surrounding sustainable development (Depledge and Chasek, 2012; Springett, 2013). These conferences converge and emerge with a plethora of non-legally binding outcomes such as those agreed on at 1972 UNCHE and 1992 UNCED and multilateral legally binding treaties such as those achieved more recently within 2012 Rio+20. According to Wagner (2013) there is an intensifying focus on the environment which has led to over 1000 Multilateral Environmental Agreements (MEAs) since UNCSD with over 200 legally binding treaties since UNCED in 1992. In the expanse of these UN negotiating systems in all the complexity and profundity of environmental, social and economic issues over the last decades, specific themes of environmental focus have been identified by Bodansky (2010) and

elaborated on by Wagner (2013) to include three waves of environmental concern that have been influenced by environmental law. These include conservation, pollution prevention and sustainable development in sequence with the UNCHE, UNCED and UNCSD respectively. Brown (2011), further elaborates that the intricate linkages and dependency relationships between the holistic health of the environment and the social and economic systems it nurtures has become more clearly defined throughout the history of sustainable development, amidst inertia-prone global economic development and social trajectories.

The 1972 UNCHE recognised the environmental and social impacts of economic development and aimed to create a new movement that addressed the inextricable links between economic development and the environment with a key focus on environmental conservation (Blackburn, 2008). A decade later the Brundtland Commission heralded an era of increasing awareness of the systemic interrelated problems of environmental degradation, societal inequity and disparity amidst a backdrop of globally uneven economic growth. The WCED, convened in 1982, deliberated and consulted widely through public hearings and stated in the seminal Brundtland Report the following:

> *Through our deliberations and the testimony of people at the public hearings we held on five continents, all the commissioners came to focus on one central theme: many present development trends leave increasing numbers of people poor and vulnerable, while at the same time degrading the environment. How can such development serve next century's world of twice as many people relying on the same environment*(WCED, 1987: 12).

The humanistic basis of the idea of sustainable development is coined in the oft quoted definition of sustainable development which is:

> *Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs*(WCED, 1987: 15).

The interrelated nature of the social and environmental aspects of the global challenges highlighted against the ideal of sustainable development cannot be separated from the economic growth paths that have created the problem or the institutional arrangements that cause these issues to persist as further highlighted by WCED (1987: 15):

> *Yet in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. We do not pretend that the process is easy or straightforward. Painful choices have to be made. Thus, in the final analysis, sustainable development must rest on political will.*

The globalised nature of the sustainable development challenge does not overlook the national and local call to industry to mobilise and embrace the changes that this radical ideal proposes. Specifically the Brundtland Report identifies the critical role that national institutions of government and business in this endeavour. According to the WCED (1987:153):

> *Industry's response to pollution and resource degradation has not been and should not be limited to compliance with regulations. It should accept a broad sense of social responsibility and ensure an awareness of environmental considerations at all levels. Towards this end, all industrial enterprises, trade associations, and labour unions should establish companywide or industry-wide policies concerning resource and environmental management, including compliance with the laws and requirements of the country in which they operate*

The sustainable development call to action has set the stage for a new era of business operations that fundamentally challenge the ethics and normative theories and practices of economics (Bavaria, 1996; Meima, 1997; Blackburn, 2008; Hazelton, 2009). Following on the momentum generated from the Brundtland Commission and amidst grave environmental disasters such the Love Canal toxic release in New York or the deadly Bhopal incident in India, and growing concerns over ozone depletion and global warming, the UNCED endorsed forging specific sustainable development outcomes through various declarations and agreements on a multilateral level (Morrow, 2012; O'Riordan *et al.*, 2012; Danilov-Danilyan, 2014). The Rio Declaration encapsulated a sprawl of sustainability goals, aspirations, and an "ambitious Agenda 21, plus three international Framework Conventions on Climate Change, Biodiversity, and Desertification" respectively (O'Riordan *et al.*, 2012: 45). The main shift in focus between Brundtland and Rio, was, the protection of the environment as integral in informing social and economic concerns, thus allowing for a greater understanding of the dependence on the health of the environment as a precursor to environmentally sound development that can also accomplish social imperatives in combating poverty and addressing

wider socio-economic issues (Morrow, 2012). In other words the environment was seen as more foundational to social and economic issues as opposed to having an equal footing with these (Springett, 2013; Dylan, 2012). Rio '92 at the time was unrivalled by the scale of participation and complexity of the global environmental agenda (Danilov-Danilyan, 2014).One of the Rio '92 outcomes, the adoption of Agenda 21, hailed as a blueprint to rethink economic growth, advance social equity and ensure environmental protection also had a distinct ground roots approach, colloquially termed *think global, act local* (Allenby, 2012; Dylan, 2012). Agenda 21 was adopted as a voluntary initiative by 178 countries at the 1992 Rio conference and has been reaffirmed at multiple conferences since, with many governments, non-profit organizations, and business associations working to implement many of its principles(Norton, 2014: 325).The UNCSD (1992:289), for instance endorses these principles in the claim that, "business and industry, including transnational corporations, should recognise environmental management as among the highest corporate priorities and as a key determinant to sustainable development."In addition, the UNCSD encourages business to cooperate with workers and trade unions to engage in environmental training to implement sustainable development, stating:

> *Industry and business associations should cooperate with workers and trade unions to continuously improve the knowledge and skills for implementing sustainable development operations(UNCSD, 1992: 290).*

A decade later, the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg was considered a failure compared to the outcomes a decade earlier which included two major conventions along with Rio Principles (Speth, 2003; Allenby, 2012). Despite not achieving the goals of Rio '92 , the WSSD Johannesburg Plan of Implementation (JPOI) was considered only an encouragement to developing countries to meet their Kyoto Protocol obligations (Speth, 2003). The JPOI had returned once again to more social and economic issues centralised around the Millennium Development Goals (MDGs) and relegated environmental issues to the background of these issues (Morrow, 2012). South Africa, a signatory to the Kyoto Protocol for the United Nations Framework Convention on Climate Change (UNFCCC), with developing country status and obligations, was also the host of the 2011 UNFCCC COP 17 in Durban(DEA, 2011a; Allenby, 2012). However, Allenby) comments that only a vague commitment was made to formulating new policy to replace the Kyoto Protocol. The most recent staging of the sustainable development fora was in 2012 at the UNCSD Earth Summit in Rio de Janeiro (Rio+20). Rio+20 was however strongly criticised for "adhering to sentiment"

as stated byAllenby (2012: 2). Contextualised by a recent economic recession, the conference had a distinct shift towards social and economic agendas as opposed to sustainable development (Brown, 2011; Morrow, 2012; O'Riordan *et al.*, 2012). Conceptualised here are the ideas of a green economy that harnesses a triple win in terms of sustainability, equity, and social development (Allenby, 2012; Morrow, 2012). A green economy is envisioned as one that still operates in the neoclassical paradigm of economic growth to advance human wellbeing but in a way that capitalises on ecological and environmental protection measures through innovative and adaptive green technology, an environmentally adjusted market and restructured economy (Martin *et al.*, 2011; Musango *et al.*, 2014). This New Green Deal highlights the shift in greater emphasis on ecological economics and the internal accounting of ecological services previously discounted, including a revived global economy less dependent of non-renewable resources such as crude oil and with the overarching aim of uplifting the impoverished majority globally (Bauhardt, 2014). There was also a move towards committing governments to the formulation of Sustainability Development Goals (SDGs) which would extend beyond the near-expired MDGs that will more holistically frame the poverty protocol needs of a changing global poverty landscape than at the onset of the MDGs in 2000 (Clarke and Feeny, 2011; Griggs *et al.*, 2013; Brolan *et al.*, 2014).

The criticisms of the 2012 UNCSD in forging a new era of sustainable development with the co-operation of national governments, is proving to be insufficient and one of the subtle successes of Rio+20 was the increased inclusion and involvement of Corporate Executive Officers (CEOs) and Non-Governmental Organisation (NGO) members. This inclusion of 1500 CEOs from around the world, showing commitment to environmental performance is indicative of the move once again to continue to strive for sustainability at the grassroots and corporate business level(Allenby, 2012).

2.2.2 Sustainable Development Critique

Sustainable development has evolved into a contested concept as it cuts across several disciplines of enquiry and pertains to all scales of organisation from global to local governments, businesses and individuals in an attempt to mobilise, change and create new forms of governance within economic, social and environmental paradigms(Griggs *et al.*, 2013; Blackburn, 2008). Sustainable development has also evolved in a global context of competing political, ethical, sociological and ecological ideologies which has provided multiple avenues

of critique. The teeming interdisciplinary work and academic pursuits of the concept has led to it being argued as a diffuse concept embracing a revolutionary ideal but providing little direction on how to achieve it(Springett, 2013). Sustainable development is also a political concept as it sirens a need for global change and call to balance the hegemonic power in competing global issues around economic development and social and environmental issues. It challenges a global restructuring of economic models of production and as well as consumption patterns such as those currently discussed as a precondition for the new era of green growth and ideas around 'de-growth' which pertain to addressing governance around human consumption patterns that drives the free market machine which has historically taken humanity into an ecological cliff-edge (Brown, 2011; Lorek and Fuchs, 2013).

The Brundtland ideas have furthermore received strong criticisms as legitimising business as usual by positioning the environment on an equal footing as the economic or social goals instead of giving it a foundational position and therefore represents a weak ecological model for change (Morrow, 2012). Others have criticised the concept of being a repackaged rhetoric of old imperialist development agendas as a precursor to the sustainable development ideas where global north economies and environmental ideals are not threatened by global south development ambitions (Brown, 2011; D'Souza, 2002). Difficulties related to the definition of sustainability show that sustainable development is a complex and multidimensional issue, which combines efficiency, equity, and intergenerational equity based on economic, social, and environmental aspects. Sustainable development has been incrementally implemented over that last couple decades and this approach is considered insufficient for the urgent tipping point crisis currently faced (Clapp, 2008).

Globally, the challenge to restructure our economies to improve ethically and equitably in global trade that fosters development which enables the present generation to access a quality of life that will not betray the environment to destruction is a radical challenge. However this sentiment is prone to the vagaries of political will influenced strongly by powerful corporate monopolies and national development priorities(Karliner, 1997). As a case in point, the conflicting multilateral priorities of the World Trade Organisation (WTO) and those of the Kyoto Protocol have been argued to undermine global climate change carbon reduction strategies for arguably, equally important trade barrier reduction measures (Frankel, 2005; Aichele and Felbermayr, 2013). Similarly Bond (2013),provides a critique of the South African neoliberal, enabling sub-imperialistic tendencies of hegemonic economic development

activities that are considered ecologically and socially maleficent. Several researchers have identified the enormity of this challenge as a source of criticism of sustainable development, often to be dismissed as wholly unachievable, elusive or prone to legitimising institutional monopolies that make the idea inert (Blackburn, 2008; Springett, 2013). Brown (2011: 95) however contextualises the enormity of the debate over sustainable development within the contemporary ecological crisis by stating that as "the world today is ecologically and economically interdependent, today's environmental crises are uniquely global in scope".

2.3 Influence of Ecological Modernisation in Environmental Management

Ecological modernisation is a policy-orientated discourse initiated by German, Joseph Huber, in the 1980s, theorising that the ecological stage of industrial development would harness technology to overcome the polluting and environmentally unfriendly industrialisation of the day (Mol, 1995; Barry, 2005; Oelofse *et al.*, 2006). Various authors have agreed that ecological modernisation continued to be developed in the 1990s, with a range of scholarly contributions to interpreting ecological modernisation such as a legitimising ideology and new departure in environmental policy; and as an approach to policy analysis and as a social theory (Mol 1995; Weale, 1992; Elkington and Burke, 1991; Young, 1993 cited in Barry, 2005). Although ecological modernisation has come to be as contested as sustainable development in its interpretation, it is fundamentally an innovation-orientated and technology-based approach to environmental policy analysis (Barry, 2005; Jänicke, 2008). In agreement Buttel (2000), comments that ecological modernisation is perhaps a synonym for sustainable development.

The impact of these ideas on corporate organisation and greening is significant as commented on by Jänicke (2008) who notes that ecological modernisation is a global process placing significant demands on industry to change from dirty industrialism to innovative clean technologies and embrace environmental management. While there remains a strong emphasis on the adoption of clean technologies as an outcome of this discourse, some authors contend that there is limited scholarly attention to the application of ecological modernisation in organisational greening (Murphy and Gouldson, 2000; Pataki, 2009).

Ecological modernisation has been explored from various academic perspectives which range from prescriptive uses to descriptive deployment of the approach in environmental management, corporate organisation and government regulation (Murphy and Gouldson,

2000). The prescriptive and descriptive uses of ecological modernisation lends itself to various interpretations mainly as a sustainable model for society, industry, government interactions or the descriptive use for analysing environmental policy, economy, and institutional interactions (Barry, 2005). Ecological modernisation bears significant relevance to this thesis as an explanatory construct for corporate environmental management, shifts to voluntary self-regulation and the tool of environmental training in adapting to increasing techno-based solutions to cleaner production and environmental responsibility. The prescriptive use of this idea is widely promoted as both a political and social theory that analyses the globalizing *new world order* couched within a global environmental crisis underpinned by the dominant theory of ecological modernisation (Hajer, 1995; Buttel, 2000; Mol, 2000). In addition ecological modernisation was seen to be a timely approach in the 1990's to meet the increasing demand for eco-friendly products and services, and growing government commitment to environmental protection (Barry, 2005).

2.3.1 Technological development

Ecological modernisation is underpinned by the promotion of advancing science and technology in driving innovation by capitalizing and economising ecological capital and ecological services through cleaner technologies (Pataki, 2009). Science and technology are seen as vehicles of this approach to environmentally sustainable economic development through resource efficiency and pollution prevention (Christoff, 1996; Blowers, 2000; Berger *et al.*, 2001). Technological development that leads to innovation and competitiveness is harnessed within a motivating regulatory environment where governments create sufficient regulatory impetus to overcome organisational inertia to innovate to use clean technologies instead of control technologies(Murphy and Gouldson, 2000; Er *et al.*, 2012).Ecological modernisation is characterised by innovative technological advancement and diffusion prevalent in policy and industrial rhetoric as 'industrial ecology' or a new 'green deal' that supports eco-innovation for environmental changes (Jänicke, 2008; Er *et al.*, 2012). This type of innovation is underpinned by a shift from end-of-pipe treatments to proactive eco-efficient management and technological advancements (Jänicke, 2008). Inherent in this theory and relevant to this study is the negotiated terrain of the environment-business-regulation nexus to enhance innovation and competitive advantages of environmentally progressive corporations. Within this, environmental training is critical for the development of technical knowledge that enables the ecological modernising of industry by empirically examining the effect of

regulation that fosters innovation for environmental change in industry ((Murphy and Gouldson, 2000). Furthermore, Murphy and Gouldson (2000:35), argue that, "firms which have successfully mastered the operation of old technologies and techniques commonly face difficulties in overcoming the limits of existing skills and knowledge and in acquiring the new skills and knowledge needed to successfully apply new technologies and techniques".

2.3.2 The Commoditisation of the Environment

Ecological modernisation promotes an optimistic view that environmental concerns are not in conflict with existing polities of advanced capitalistic systems. For example, Jänicke (2008: 1), states "…an environmental problem proves less difficult to resolve if a marketable solution exists." Ecological modernisation challenges the zero-sum, economy-pitted-against-the-environment way of thinking of the 1970's and '80s, where environmental protection and economic growth were predominantly thought of as mutually exclusive ideals (Barry, 2005). Ecological modernisation motivates for a market-driven, technologically innovative business response to environmental problems, essentially equating environmental problems to manageable and profitable business problems. Hajer (1995: 32), argues that ecological modernisation is "basically a modernist and technocratic approach to the environment that suggest there is a techno-institutional fix for the present problems." Several authors indicate the commoditisation of air quality for example through carbon credits is a case in point or the implementation environmental management systems such ISO 14001 (Jänicke, 2008; Sonnenfeld and Mol, 2011; Aichele and Felbermayr, 2013). As Cohen (2006: 532), points out, such a techno-orientated shift, "is not a matter of ensuring superior performance based on narrow environmental criteria, rather [it] entails the full integration of environmental considerations into product design and process organization. Such a shift becomes an important source of comparative advantage." This is the keen rhetoric used to consider the motivations of EMS adoption examined further in this chapter.

In business terms ecological modernisation has been promoted by ascent to the environmental Kuznets Curve hypothesis which states that "beyond a certain level of income some aspects of environmental quality improve further with economic growth" (Elkins, 2000 cited in Barry 2005:307). Ecologically modernisation is consistent with this view, that pursuant to the internalisation of ecological externalities in business, the economic reward can only be deliberatively realised through policy and market based instruments (Barry, 2005; Orsato and

Clegg, 2005). There is therefore no trade-off between environmental protection and economic growth but rather a win-win outcome which presents a very optimistic view of ecology-economy dilemma (Orsato and Clegg, 2005). There is a theoretically positive link between pollution reduction and greening corporate activities such that the normative application of ecological modernisation in win-win rhetoric is at the apex of its success. As several authors have alluded, this is indicated by the increasing presence of corporate social responsibility, corporate environmental management, environmental certification schemes (such as ISO), green technology adoption as well a cooperative partnering with NGOs and government regulators to further environmental protection(Janicke and Weidner, 1995; Mol and Spaargaren, 1993,2000 cited in Selim, 2011).The real benefits of ecological modernisation are in its corporate competitiveness appeal whereby "instead of seeing environmental protection as a burden on the economy, the ecological modernist sees it as a potential source of future growth (Weale 1991 cited in Cohen 1997: 109).

2.3.3 Changing role of Government

The role of government in this discourse has remained an imperative, to set standards and provide a conducive political and regulatory climate for innovative and competitive production and corporate activities such that the government is an enabler of successful economic activities with the dual purpose of promoting environmental protection (Barry, 2005). Jänicke (2008) further emphasises the changing role of the state in the development of this discourse to one that encompasses 'smart regulation' as a key driver for environmental management innovation and competitive advantage. Here, regulation benefits business by creating or supporting markets for domestic industry, creates a predictable corporate environmental management playing-field; and reduces internal business organisation impediments to environmental change on the basis of legal compulsion. Regulated capitalism is therefore making a comeback but on a newly negotiated terrain to meet economic development and protect the environment. However, Barry (2005:307) asserts that in ecological modernisation, market-based solutions are preferred for environmental management where government's role is "setting of environmental targets and leaving it to the market actors to decide on how best to achieve them."

In addition, an involved and participatory society is mobilised to challenge institutional limitations to effect changes in greater innovation and knowledge development such that

environmental impacts are reduced. This is argued as a reflexive institutional response in Beck's 'Risk Society' analysis calling for organisational and government cooperation to redistribute and manage environmental and technological risks (Beck, 1992; Cohen, 1997). Ecological modernisation has seen shifting contributions to the role of government from command and control to partnerships, cooperation and the building of social capital between stakeholders, corporations and government. This emphasis on cooperation is considered less reactive and one that promotes participatory governance. However, Christoff (1996: 482) argues that ecological modernisation is a "discursive strategy useful to governments seeking to manage ecological dissent and to re-legitimise their social regulatory role". Jänicke, (2008:561) asserts that ecological modernisation is a global response to changing stakeholder pressures such that the globalised nature of the environmental crisis has created a "constellation of environmental policy actors" contributing to an "explosion of complexity" where multi-level and multi-stakeholder pressures, force industry to conform to better standards of environmental best practice. The complexity of the environmental challenge and multiple governance actors previously only limited to government and industry, has now expanded to non-government organisations (NGO's), civil society, environmental groups, and consumers, and this has created a policy environment of uncertainty that is considered one of the driving forces of ecological modernisation (Jänicke, 2008). Social theorists interpret the ecological crisis to induce a state of flux in global institutionalism, economic development and corporate responsibility where there is indeed, "the proliferation of non-governmental environmental governance regimes, around for instance various certification schemes" (Er *et al.*, 2012: 772).

Some of the characteristics of environmental reform, which can be identifiably traced back to environmental management practices discussed throughout this chapter, coincide with the perspective adopted by Cohen (1997:109), who states that:

- As part of a process of super-industrialization, key element of environmental reform is to change to cleaner technologies, becoming more resource efficient and therefore cost efficient. A move keenly motivated by regulations and expectations of which are managed in businesses more successful through the implementation of an EMS.
- Secondly is a proactive and anticipatory planning approach to developments such as envisioned in the precautionary principle of sustainable development, and serves as one of the adaptive determinants to the implementation of a proactive EMS.

- Lastly is the organisational internalising of ecological responsibility as is seen in corporate governance and environmental management.

2.3.4 Critiques of Ecological Modernisation

The critiques offered by several authors of ecological modernisation reveal that it is not a radical interpretation of sustainability but subjects the environment to the supremacy of the market and science-led technology, to pursue economic growth while purporting environmental benefits (Mol, 1995; Cohen, 1997; Jänicke, 2008). The de-linking of the environment from technological advancement has been the cause for significant critiques involving securing a lasting change towards environmental harmony, social justice, institutional reform, and global environmental justice. Ecological modernisation has a significant body of work alluding to the weaknesses of this ideology from radical environmentalists to post-modernists such as Sachs (1993), Blowers (1997), Christoff (1996) and Berger *et al.* (2001). The debates revolve around the continuum of weak and strong ecological modernisation (Table 2.1), as described by Christoff (1996). Gibbs *et al.* (1998) concur that weak ecological modernisation promotes a form of ecological sustainability while lacking in substance by perpetuating environmentally destructive, extractive, hegemonic and socially inequitable economic growth.

Table 2.1: Weak and Strong Ecological Modernisation from Christoff (1996:490)

Weak ecological modernization	**Strong ecological modernization**
Economistic	Ecological
Technological (narrow)	Institutional/systemic (broad)
Instrumental	Communicative
Technocratic/neo-corporatist/closed	Deliberative/democratic/open
National	International
Unitary (hegemonic)	Diversifying

The monetising of the environment is specifically seen as a weak model of sustainability and voluntary regulatory mechanisms or self-regulation represents weak governance and a co-opted government enabling, a debatably, business-as-usual capitalism (Sachs, 1993 cited in Selim, 2011). It has also been criticised as the imposition of western hegemonic scientific and technocratic ideas theorised and imposed on developing countries. This is deemed to be dealing

simplistically and even unjustly to differing social and economic realities (Christoff, 1996). Radical environmentalists view the technocratic approach of ecological modernisation as perpetuating a utilitarian exploitation of resources and presents no radical shift in demand to restructure economic development (Pepper, 1998). Furthermore, the prized benefits of ecological modernisation such as resource efficiency are considered a dilution of the urgency of the environmental crisis such as climate change by narrowly subjecting it to scientific and managerial expertise(Dryzek, 1997; Oelofse *et al.*, 2006). In reluctant defence to this assertion, Orsato and Clegg (2005) assert that ecological modernisation identifies that the design of systems of production and consumption within capitalism require greening reform but not necessarily ceding to a negative causal relationship between expansionism and environmental degradation.

Ecological modernisation has been further critiqued for being a western construct that has gained legitimacy as a proponent of sustainable development albeit a weak interpretation of the concept. It does however, represent the mainstream approach to environmental management (Christoff, 1996; Oelofse *et al.*, 2006). South Africa has not been immune to this influence and is considered a country that has adopted the mainstream weak ecological modernisation model from developed western countries (Oelofse *et al.*, 2006). The challenge of adopting this model in South Africa, according to Oelofse *et al.* (2006:64), is the inadequate development and presence of requisite conditions for the adoption of this ideology such as "advanced democracy, capital, capacity and technology". The challenge of adopting ecological modernisation is further highlighted in the developing context where the extremes of poverty and environmental degradation render ecological modernisation untenable (Blowers and Pain, 1999; Oelofse *et al.*, 2006). The inattention to the social disparities and institutional inadequacies of the developing country context is explained by the scientific and technological leanings of this discourse, rendering immeasurable the social and developmental contexts of its deployment. On a macro-level, "radical reformism" is proposed to transition societies to ecological modernities that engage deliberatively, democratically and reflexively with social actors in bringing about incremental institutional reform while radically pursuing technological advancements to further ecologically sustainable development (Orsato and Clegg, 2005: 264).

2.3.5 Corporate Response to Ecological Modernisation

Corporate environmental reformism is a response to the ecological modernisation approach, and it is characterised by incremental change working within the rules of economics to produce sustainable ecological change (Orsato and Clegg, 2005). Incrementalism, as Orsato and Clegg (2005) continue to explain, is a guiding principle of organisational changes in the adoption and implementation of EMS such as ISO 14001 and it is this anthropocentric incrementalism that is critiqued by radical environmentalists as being insufficient for the ecological task at hand. These debates continue in the search for alternative theoretical frameworks until which time an impasse looms on economic development that will simultaneously appease radical environmentalism and incremental reformist approaches. Monbiot and Porritt, (2000 cited in Barry 2005:315) states that "self-interest...works far more powerfully than vapid moralising when dealing with the company as a whole...its real success lies in the unceasing, undramatic, persuasion and pressure, leading to a steady and incremental change amongst both politicians and business people". As Cohen (2006: 536) points out, speaking to the similarities between Pinchotism and ecological modernisation, " industrial corporations acting in their own interests rather than out of an altruistic sense of social responsibility, would be the engines of environmental reform."

2.4 ENVIRONMENTAL MANAGEMENT

Environmental management is a misleading term as this approach is not about managing the environment but rather managing the interactions and activities of modern societies and their impact on the environment (Delvin, 2011). The exact definition of environmental management remains elusive but is rather a collective idea that has been articulated in law, policy and strategies to further sustainable development and to regulate economic and social activities that may impact the environment adversely (Nel and Kotze, 2009). Mentis (2010), advocates the strong link between environmental management and environmental risk, wherein risk is reduced and environmental impacts are managed to an acceptable level. In a corporate sense environmental management is the business management of risk, by protecting shareholder value, securing competitiveness and is part of the corporate drive to innovate and adapt to change (Walley and Whitehead, 2000; Lesourd and Schilizzi, 2001). The framing of environmental problems and the range of economic and social changes required is the broader debate for sustainable development which informs this regulatory approach. Environmental management is an encompassing approach to realise sustainable development at the point of

environmental impact which is the interface with economic development and its activities with a particular emphasis on managing industrial, development and corporate processes to minimise impacts, and maintain compliance to regulatory standards and norms through operational policies and practices that address these efforts (Jabbour and Santos, 2006). There is consensus from several authors that the main motivating drivers for corporate environmental management are based on ethics, competition and legitimisation (Lesourd and Schilizzi, 2001; Pitelis, 2013; Lannelongue *et al.*, 2014b).

Environmental management was originally conceived as a regulatory measure with a hierarchical command-and-control approach stemming from various international legal and international treaty influences as well as early narratives such as the 1970's Limits to Growth publication warning of apocalyptic results from unchecked production and consumption patterns (Jabbour and Santos, 2006; Stevens *et al.*, 2012). Environmental management is firmly rooted in environmental law and legal sciences and legislative imperatives shape and determine corporate activities; while the response of companies to the environmental legislative context shapes much of the corporate governance discourses(Benn and Dunphy, 2007; Nel and Kotze, 2009). The wave of environmentalism that influenced and continues to influence environmental law formulation such as the US Environmental Protection Act (EPA) or the South African National Environmental Management Act 107 of 1998 (NEMA), is evidence of the commitment to publicly steward and protect the biosphere which is an accepted political reality though what remains is the negotiation of the level and methods of environmental protection (Sabel *et al.*, 2005).

Regulatory-led compliance has made important advances in reducing industrial pollution and spurring business activities to greater levels of environmental compliance and corporate governance (Stevens *et al.*, 2012). One of the major shifts is the growing acceptance by business for environmentally responsible behaviour. Notably the shifts in these ideas are from regulatory led measures to private voluntary institutionalism of environmental management which moves environmental management beyond reactive compliance to proactive stewardship of the environment in economic and business activities (Wurzel *et al.*, 2013). Voluntarism however does not mean abdication of government authority on environmental issues as it pertains to businesses but rather moving from adversarial between business and regulators to partnering for improved environmental stewardship(Sabel *et al.*, 2005; Gale, 2006). Delmas and Toffel (2008) distinguish the market from the non-market institutional pressures that drive

beyond-compliance organisational adoption of strategies such as those within environmental management, indicating market pressures from customers and suppliers are considered as key drivers for organizational environmental management change such as adopting ISO 14001.

2.4.1 Legal Leanings of Environmental Management

The onset of environmental concern was strongly met with a technocratic and pollution prevention approach of environmental legislation initially promulgated in the USA in terms of the NEPA, with the growing and regionalised western impetus of sustainable development in the late 1980's integration of social, environmental and economic issues gaining more focus (Sowman *et al.*, 1995) . This challenge was met in part by adapting environmental management ideas into integrated ideas of environmental management. The growing trend resulted in 1989 with the passing of South Africa's first environmental legislation though limited in scope, and relatively late globally, as the Environmental Conservation Act 73 of 1989 (ECA)(Sowman *et al.*, 1995; Nel and Kotze, 2009). The ECA adopted principles of sustainable development and used integrated environmental management as a key approach to legislatively promote sustainability and conservation. The NEMA has, in subsequent years, repealed the greater part of the ECA and stands as the fundamental legislative framework for governing environmental protection, compliance as well as enshrining important constitutional rights. The NEMA is a regulatory framework, which upon implementation, addresses the effects of social and economic activities on the environment. The NEMA is fundamentally founded on principles of ecological sustainable development with a strong emphasis on constitutional environmental rights (Kidd, 1997a; Nel and Kotze, 2009). This is endorsed through Section 24 Constitution of the Republic of South Africa, Act 107 of 1996 (RSA, 1996.-a) which states that,

Everyone has the right-

a. *To an environment that is not harmful to their health or wellbeing; and*
b. *To have the environment protected, for the benefit for present and future generations, through reasonable legislative and other measures that –*
    i. *Prevent pollution and ecological degradation;*
    ii. *Promote conservation; and*
    iii. *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

The NEMA is the legal measure of the Constitution of the Republic of South Africa (hereafter referred as the Constitution) and gives legislative effect to the Bill of Rights in Section 24 of the Constitution (Kotze, 2007). The environmental right is couched in terms of human well-being and the environment is valued instrumentally for this purpose as is further stated in the NEMA S2(2) wherein environmental management "must put people and their needs at the forefront of concern" (RSA, 1998.-a). Legislative instruments such as the NEMA is important to regulate much needed economic development without eroding social and environmental capital (Sowman *et al.*, 1995; Ridl and Couzens, 2010).

The definition of the environment alludes to an anthropocentric legislative lean as espoused in the NEMA Section 1 as "… the surroundings within which humans exist …" (RSA, 1998.-a).This definition leaves considerable room for ecocentric and anthropocentric interpretation when negotiating sustainable development within economic, social and ecological priorities (Nel and Kotze, 2009). Furthermore, the environmental right is given equal footing in the Constitutional Bills of Rights in Section 24 and therefore economic arguments can no longer have exclusive consideration in decision making and South African courts for example reflect this integrated and equally weighted notion (Kotze, 2007; Nel and Kotze, 2009).

However, development and business responsibility are further emphasised in the principles of environmental management in the NEMA to be risk averse and precautionary whilst creating significant liability in the event of errant non-compliant actions as stipulated in the Environmental Management Principles of the NEMA Chapter 1 Section 2 (4) (RSA, 1998.-a), "*The costs of remedying pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment."*

Furthermore Glazewski (2000) and Van der Linde (2009) allude to the following key attributes of the NEMA:

- It fosters cooperative governance through government institutions that will enforce environmental protection within Scheduled regulations and legal penalties for violations,
- Promotes integrated environmental management and environmental impact assessment
- Makes provision for environmental decision making and gives environmental issues a substantial platform for consideration in various levels of decision making.

Furthermore the NEMA gives ascent to the integrated nature of environmental problems and to this end calls for an IEM approach in Chapter 1 Section 2(4) of the Environmental Management Principles(RSA, 1998.-a):

"Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option"

2.4.2 Integrated Environmental Management (IEM)

Tensions persist in the search for sustainable development within a developing economy and environmental management is not without considerable challenges as businesses strive to lobby economic interests in which environmental and social considerations can seem adversarial (Ridl and Couzens, 2010). Environmental management by definition extends to various inter-disciplinary spheres and therefore a co-ordinated approach is imperative such as is offered through IEM (Margerum and Born, 2000). The NEMA aims to provide the legislative basis for establishing institutions to foster cooperative governance, and a holistic and IEM approach and to this end; IEM is a guiding philosophy in NEMA. According to DEAT (2004: 6), "the implementation of IEM was largely focused on one tool, the Environmental Impact Assessment (EIA) that focused on new project proposals….the key challenge is to support sustainable development through the use of a wider range of environmental assessment and management tools across the full activity life cycle and by all sectors of society." IEM was initially envisioned as an approach combining a suite of environmental evaluation tools notably the EIA. However, with the advent of the NEMA, the approach has been revised to be more holistic and not just limited to EIAs. IEM also facilitates decision making at all stages of a development cycle including guiding consideration at the policy, programme, plan and projects levels (Sowman *et al.*, 1995; DEAT, 2004). The DEAT (2004:8) defines IEM as "a holistic framework that can be embraced by all sectors of society for the assessment and management of environmental impacts and aspects associated with an activity for each stage of the activity life cycle, taking into consideration a broad definition of environmental and the overall aim of promoting sustainable development."

There is a synchrony between the NEMA, sustainable development and IEM, where IEM is an approach and a philosophy that supports sustainable development. As stated in the preamble of

the NEMA, IEM is described as 'the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations" (RSA, 1998.-a). Within the NEMA Section 2, the environmental management principles embrace the IEM philosophy and have been further outlined by DEAT (2004) to include 19 underpinning principles of IEM which include relevant concepts of co-operative governance, precautionary approach, polluter pays and transparency. Furthermore, IEM objectives are outlined in the NEMA Chapter 5 Section 23(2) as follows (RSA, 1998.-a):

The general objective of IEM is to-

(a) Promote the integration of the principles of environmental management set out in Section 2 into the making of all decisions which may have a significant effect on the environment;

(b) Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in Section 2;

(c) Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;

(d) Ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;

(e) Ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and

(f) Identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in Section 2.

Given the weight of legislative credence to the concept of IEM, it is also prone to the vagaries of misinterpretation and this has been critiqued as a significant shortcoming to realising sustainable development outcomes (Nel and Du Plessis, 2004). The misunderstandings of IEM can undermine co-operative governance and regulatory effectiveness of environmental management by perpetuating the duplicity of the term which has come to mean different things to different people as outlined in Nel and Kotze (2009:30):

- IEM is a synonym for EIA

- IEM means integrated environmental governance of fragmented environmental governance efforts at different spheres of government
- IEM as meaning adoption of the NEMA principles and tools by other organs of state in line with duty of co-operative governance
- IEM as meaning the adoption of a holistic and integrative perspective of planning and decision processes by considering numerous parameters to inform decision-making processes.

Nel and Du Plessis (2004:190), note that a clarification of the term IEM in so far as, "...policy, intent and definitions are concerned is therefore an imperative first step to realise the objectives of co-operative governance."

IEM has significant implications for businesses and integrating environmental concerns into core business strategy is promoted. Economic development is not always complementary to the ideals of environmental sustainability but it is inextricably linked and these linkages require an integrated approach to maximise the benefits and opportunities within the greening of business activity (Walley and Whitehead, 2000; Bernardo, 2014). Integration of environmental priorities is considered a proactive strategy that will help companies move from limited and reactive compliance to an adaptive and environmentally sound business strategy that can pre-empt and successfully negotiate the uncertain and changing environmental terrain in which businesses find themselves operating in today (Lesourd and Schilizzi, 2001; Bernardo, 2014). Jabbour and Santos (2006), further highlight that companies are motivated to integrate environmental management into business organisations at varying degrees of commitment but are encouraged to do so by the broad categories of realising economic benefits and strategic benefits. Nel and Kotze (2009: 13), explain that proactive and adaptive strategies are very important as business operates in a fluctuating and fast changing social and ecological environment characterised by the following:

- Complexity and interconnectedness of environmental issues along with the high levels of uncertainty and unpredictability of cause and effect relationships,
- Spatial and temporal scales of environmental issues add new layers of complexity and these are in a state of flux. This therefore necessitates a multidisciplinary, integrated approach among others.

The suite of IEM environmental assessment tools, which span some twenty different environmental assessment methodologies, give rise to the need to understand its applicability as a significant enabler for corporate environmental management (DEAT, 2004; Bernardo, 2014). This understanding is essential at company-level activities and for regulatory compliance which can be seen to further necessitate environmental training. The management of environmental issues at a company or project level has historically been promoted to address legal compliance with environmental regulations (Meima, 1997; Nel and Kotze, 2009). To this end, environmental management is couched in the traditions of management and Deming Management cycle of Plan, Do, Check, Act (PDCA) in which follows the sequential steps of environmental management systems such as ISO 14001 (Nel and Kotze, 2009).

2.4.3 Environmental Management Systems

The increasing regulatory context in which companies operate and the combined societal, stakeholder, and consumer pressures for environmentally sound products and processes, creates an evolving reality of increasing environmental pressures that has had significant impact on corporate behaviour in the last three decades(Karliner, 1997). However businesses do still present ambivalence according toFreemantle (2008: 10), "but many still regard sustainability issues as peripheral to their core business and an unnecessary burden or a task to be tacked as an adjunct to business as usual". While there is a strong indication that environmental management has been understood traditionally as an add-on to company management, the idea is evolving to include companywide integration (Freemantle, 2008).

The growing adoption of EMS's globally in excess of 88,800 facilities certified under ISO 14001 for example since 1996, has attracted significant scholarly attention to the discipline of EMS's (Darnall *et al.*, 2008: 364). A succinct definition of an EMS is presented by Zorpas (2010: 1547) as "a set of processes and practices that enable an organisation to reduce its environmental impacts and increase its operating efficiency. An EMS is a continual cycle of planning, implementing, reviewing and improving the processes and actions that an organisation undertakes to meet its business and environmental goals". An EMS incorporates a range of regulatory agency standards, international treaty standards, and specific industry standards where such standards are developed by national or regional standard setting organisations (Krut and Gleckman, 1998). Historical examples of EMS systems developed internationally include the British Standards Institution, BS7750 developed in 1992 and in

1993 the regionally developed European Commission Eco-Management and Audit Scheme (EMAS) (Krut and Gleckman, 1998). The voluntarism of an EMS such as ISO 14001 is voluntary only by omission in legislation but is perceived by industry and government officials as beneficial and therefore is ambiguously mandatory (Krut and Gleckman, 1998; Morrow and Rondinelli, 2002).

Government-enforced adherence to legal regulations to ensure compliance to environmental laws is a plausible method of managing the interface of industry and its environmental impact but has been met with varying criticisms of ineffectiveness of resources and enforcement (Potoski and Prakash, 2013). The effectiveness of command-and-control enforcement have been countered by business to address issues of efficiency that do not compromise effective environmental compliance (Kashmanian *et al.*, 2010). The business case argues that compliance is a narrow business response and does not guarantee overall sustained business change towards efficient and effective environmental management (Fourie *et al.*, 2012). In addition avoiding and managing the risks of environmental liability is met with broader corporate issues of competitiveness and shareholder value and stakeholder pressures (Smith, 1993; Karliner, 1997). An EMS represents a shift from exclusive hierarchical government imposed regulation to the assimilation of the environmental imperatives into business strategy. The shift in environmental management thinking has largely been preceded by changes in various policy instruments in corporate environmental management as detailed in Table 2.2.

Table 2.2: Typology of Environmental Policy Instruments from Wurzel (2011:27)

Types of Environmental Policy Instruments	Examples
Voluntary Instruments	Voluntary agreements and eco-management and audit schemes such
Market Based Instruments	Eco-taxes and emissions trading schemes
Regulatory Instruments	Regulation(including traditional command-and-control regulation and innovative smart regulation)

An EMS as part of voluntary policy instruments do not replace but rather complement and supplement regulatory and market based instruments. Environmental policy is inherently regulatory by nature and the top-down command-and-control method of addressing industrial activity has seen shifts in ideas from government to governance (Wurzel *et al.*, 2013). Contemporary literature alludes to the terms government and governance not being synonymous but rather represents a shift wherein industry can be self-regulated beyond

government-led regulation (Potoski and Prakash, 2013; Jordan *et al.*, 2005). Government intervention is still imperative in setting the legal framework and policing compliance, however the complexity of environmental issues and its interface with business efficiency calls for a shift and internalising of environmental imperatives wherein government is seen to have a declining ability to steer societal actors in this new age of constraints(Polity.org.za, 2013; Biermann *et al.*, 2012).This shift is received with varying degrees of scepticism and optimism. The role of corporate environmentalism is considered on one hand to override ecological sustainability with an agenda of economic globalisation thus usurping the possibility of authentic sustainable development futures (Karliner, 1997). On the other hand, more optimistically the CEO of Walmart in 2008 is famously quoted as saying that " sustainability represents the single biggest business opportunity of the 21st century and the next main source of competitive advantage"(Hanks, 2012: 7). Continuing in this optimism, Hanks (2012) asserts that while the greatest medium to long-term benefits for implementing an EMS is to systemically streamline processes and strategies with an environmental best practice focus to ultimately benefit the environment by limiting and avoiding negative impacts, an EMS has other benefits to businesses as well.

As environmental risk is an important consideration in business management, an EMS is considered a mechanism for accounting and managing this risk. Environmental risk is a complex problem as it is interrelated with other risks such health and safety of employees, capital risks and reputational risks which can all entail significant legal compliance risks of liability in cases of non-compliance. An example of this is the toxic chemical leak in the1984 Union Carbide Bhopal catastrophe which resulted in damages to the environment, equipment, reputation of the corporation and resulting in the death of thousands of workers and other local residents (Brooks and Dunn, 2010: 38). The benefits of an EMS can be seen to allay public suspicion of corporate environmental malpractice and other stakeholders such as consumers, public environmental protection groups, shareholders, supply chain and contractors (Lesourd and Schilizzi, 2001; Sarkis *et al.*, 2010). An EMS is further positioned within institutional theory which lends itself to understanding the voluntary EMS context as it provides an overview of how the isomorphic search for legitimacy occurs within regulatory, inter-industry best practice and stakeholder pressures(Morrow and Rondinelli, 2002; Lannelongue *et al.*, 2014b). An EMS is an important measure of evidence to various stakeholders to demonstrate concern and commitment to the environment (Lesourd and Schilizzi, 2001; Urban and Govender, 2012). Not without great financial cost, an EMS is considered a vehicle to earn and

secure the trust of government agencies as well as to shape and secure industry competitiveness and even the regulatory environment itself (Dawkins and Ngunjiri, 2008; Potoski and Prakash, 2013). Furthermore efficiency and proactivity arguments frame the motivational links to adopting private voluntary EMSs (Jabbour and Santos, 2006; Delmas and Toffel, 2008). There is an evolution of responses to the environmental challenge that companies can respond to and this is alluded to in Jabbour and Santos (2006)where a proactive approach embraces the environmental challenge by integrating it to corporate strategy and identifying the opportunities presented for competitive advantage while meeting the environmental targets. An EMS can effect environmental best practices through resource efficiency and waste reduction which can create significant cost saving along with value creation and protection benefits to companies while minimising impacts on the environment (Meima, 1997; Urban and Govender, 2012).

With the view to streamlining company activities to maintain regulatory compliance, an EMS is however no guarantee for exemplary environmental performance, but is currently the best systematic process for environmental compliance and innovation in corporate functions (Rondinelli and Vastag, 2000). Furthermore,Rondinelli and Vastag (2000: 507), argue that "there is a certain amount of trust that if you put a system in place to comply with the Standard that it will ensure compliance…. Not so, unless the people putting the system in place are fully aware...and are committed to adhering to compliance". Change management is an important element to adopting an EMS and Hanks (2012: 9),states that "sustainability is about change management and not crisis management." This concerns proactively adapting and anticipating to trends (Lannelongue *et al.*, 2014b). Given this there is consensus that organisational structure and organisational learning influences values, culture and the overall change of synthesising of environmental management systems to effective environmental performance outcomes in a company (Meima, 1997; Delmas and Toffel, 2008). Organisation theory is the theoretical discipline that aims to unify the emerging trends of corporate greening and creates an umbrella of approaches, which of significance to this body of work is organizational learning (Halme, 1997). Environmental training finds significant positioning within organizational learning and its relevance in knowledge formation and transfer across an organisation to implement and integrate an EMS (Jones, 2001).

Amidst the backdrop of these tensions and complexities surrounding the adoption of voluntary EMS, there is a negotiated middle-ground where the urgency of the change required by the

environmental crisis is met with corporate environmental management and can be seen with the increasing adoption of EMS (Potoski and Prakash, 2013). The EMS Standard that this research focuses on is the ISO 14001 which is the most widely adopted EMS globally and which South Africa has one of the highest certification levels on the continent (World Bank, 2000; Lesourd and Schilizzi, 2001).

2.4.4 International Standards Organisation

The history of ISO is rooted in post-war reconstruction and development era of 1946 through the merging of two independent European Standards, the International Federation of National Standardizing Associations (IFNSA) and United Nations Standard Coordination Committee (UNSCC) (Potoski and Prakash, 2013). This merging resulted in the formation of ISO headquartered in Geneva, Switzerland in 1947. The central mission of ISO is to facilitate international trade and commerce by "developing common international standards for products, materials and processes"(Potoski and Prakash, 2013: 83). ISO enjoyed significant success with ISO 9000, a Quality Management System and went on to develop an EMS which culminated in 1996 and was later revised in 2004 as the ISO 14000 series which was a considered alternative to the then dominant tool-based systems of pollution prevention known A Total Quality Management (TQM) in the 1990's (Kashmanian *et al.*, 2010). In addition ISO 14001 represents a response to the call from the 1992 Rio Summit for the standardised practices to implement environmental management practices in industry and business (Rondinelli and Vastag, 2000).ISO 14000 is a series of several separate standards which are broadly categorised into specification standards and guidance standards where ISO 14001 is the only specification standard in the ISO 14000 series and is the blueprint for an EMS against which third party certification can be attained (Krut and Gleckman, 1998).

As various authors have confirmed, from an international sustainability perspective, the ISO 14000 series is one of several industry responses to the strong interest in sustainable industrial development since the 1992 UNCED and remains globally the most widely adopted EMS (Krut and Gleckman, 1998; Rondinelli and Vastag, 2000; Moller, 2007; Nel and Kotze, 2009). Prakash and Potoski (2013) confirm that ISO's international application is made possible by the cooperation of member countries' national standards-setting organisations, failing which a country cannot establish the ISO system. This international applicability was made possible in South Africa where ISO 14001 is represented as a member country through the South African

Bureau of Standards (SABS) (Krut and Gleckman, 1998; SABS, 2014). As noted by Rondinelli and Vastag (2000: 500), " ISO 14000…has become the international benchmark by which corporations can voluntarily develop and assess environmental practices".

ISO 14001 has garnered significant academic interest from various authors specifically critiqued as a capitalist tool to legitimise and disguise poor environmental performance, to its technical flaws and comparatively less vigorous approach (Clapp, 1998; Rondinelli and Vastag, 2000; Arvanitoyannis, 2008). A significant body of research looks at the relationships between implementation and performance while offering divergent conclusions of its effectiveness in reducing environmental impact (de Oliveira *et al.*, 2010; To and Lee, 2014) . However it is clear that the ISO 14001 is a dominant EMS and has shown significant, though unevenly distributed, positive performance results. A tempered response to the critiques of ISO 14001 is that certification should not be considered a goal in itself but rather a process of on-going improvement in which benefits and shortcomings should be addressed (Boiral, 2011). Furthermore, the insightful study by Lannelongue *et al.* (2014a) shows that EMS performance studies often ignore the connection between organizational heterogeneity and the adopted EMS standard, prematurely mistaking EMS certification for performance without examining the mechanism of organizational performance namely assimilation of the EMS and duration of experience in implementing it. Lannelongue *et al.* (2014:4) comments that environmental training is identified as an important strategic resource investment in a company to aid the assimilation of an EMS, whereby training includes "modifying existing tasks or developing new ones with a lower environmental impact and, in general, involves greater awareness of environmental issues". However Lannelongue *et al.* (2014: 4), also caution that "it will take some time for employees and managers to comprehend the new environmental values and priorities and include them in the planning of any action the organisation may require".

2.4.4.1 The ISO 14001 EMS Process

According to the ISO (2004: 10), the ISO 14001 EMS is based on the methodology of the Deming Cycle framework of Plan-Do-Check-Act (PDCA) and this involves the following key steps to further a cycle of continuous improvement in environmental management:

1. Environmental Policy formulation;
2. Planning and Objectives;
3. Implementation and Operation;

4. Checking or Evaluation; and
5. Management Review.

The ISO 14001 EMS is a system approach to enable the establishment of an environmental policy and objectives in keeping with national regulations and legislation and other information to effectively manage company-specific environmental aspects with the overall aim to support environmental protection and prevent pollution (ISO, 2004). A certified ISO 14001 company is expected to comply with environmental management best practice, legislation and regulated environmental targets, however ISO 14001 does not prescribe these targets or emission levels as they may be (Boiral, 2011). ISO 14001 is a process based system and therefore does not prescribe specific industry standards for compliance but rather assumes implicit in the implemented process and procedures are incorporated regulated standards and should therefore produce desirable environmental performance outcomes (Boiral, 2011). This is consistent with the prescriptions in ISO (2004: 6) confirming that it "does not establish absolute requirements for environmental performance beyond the commitments, in the environmental policy, to comply with applicable legal requirements and with other requirements to which the organisation subscribes, to prevention of pollution and to continual improvement. Thus, two organisations carrying out similar operations but having different environmental performance can both conform to its requirements".

2.4.4.2 Motivation and Benefits of ISO 14001

The ideas of internal and external motivation are important when considering the benefits of ISO 14001 as it makes explicit the process of environmental performance rather than just the outcomes which are diverse. The benefits of ISO 14001 are predominantly seen to be internally and externally motivated benefits where internally motivated benefits relate to operational efficiencies and the externally motivated benefits relates to competitiveness and reputational capital (de Oliveira *et al.*, 2010; Prajogo *et al.*, 2012). Furthermore, Prajogo *et al.* (2012) emphasise this distinction and that environmental benefits should be pursued first before attempting to prioritise the reputational and market benefits which are legitimization seeking and not substantive to environmental performance. However, Jabbour and Santos (2006: 54) argue that external motivations can create a proactive and evolved EMS which creates win-win opportunities for effective environmental impact management and business profitability.

The benefits of ISO 14001 can be categorised broadly in to environmental, reputational and organisational benefits. The adoption and assimilation of ISO 14001 has been shown to correlate positively with environmental performance targets in managing air emissions, waste management and the use of resources (Testa *et al.*, 2014). Social benefits include promoting a strong image of reputational environmental integrity and responsibility to consumers, regulators and investors which can further benefit competitiveness through greater financial and investment opportunities (Jabbour and Santos, 2006). The organisational benefit of improved organisational culture with unified environmental values and performance along with creating company-wide awareness of environmental priorities through awareness of the ISO 14001 system, initiates multilevel interdepartmental dialogue on environmental training as it pertains to specific line functions and company processes that impact or can impact the environment with the aim of reducing, avoiding or innovating new solutions to old problems (Halme, 1997). A centralised and concerted effort by management through the implementation of procedures and regular monitoring , reporting and communication, makes continuous improvement an imperative and this is priority is translated company-wide. It also creates the motivation to continue to address these issues by both management and employees. Arvanitoyannis (2008: 49), further shows that ISO 14001 can create opportunities for the following improvements in an organization:

- Improved efficiency of operations and processes
- Environmental liability
- Reduced operating cost
- Management of supply change
- Increased productivity
- Improved financial performance
- Maintenance of consistent compliance with legislative and regulatory requirements
- Declining paperwork
- Waste reduction
- Improved community and customer relations
- Employee motivation
- Improved environmental performance
- Potential impact on world trade
- Improved customer satisfaction
- Assurance of conformity through third party verification
- Cooperation between management and employees

● Increased product quality
● Employees' responsibility
● Increased domestic market share.

A key barrier to effective ISO 14001 implementation is considered in these statements by Arvanitoyannis (2008: 67), "administrative delays, apathy and inadequate personnel and training can prevent environmental protection and improvement from happening". The author further argues that "such a system will function only with the commitment of all employees beginning at the highest level of management and the need for training; awareness for implementation and maintenance of ISO 14000 should be anticipated" (Propper, 1998 cited in Arvanitoyannis 2008: 59).Morrow and Rondinelli (2002: 170),concur that an EMS certification process such as required by ISO 14001 has shown positive performance results based on the premise that "EMS certification requires strong employee participation and environmental training programs, many firms report increased employee awareness of the environmental aspects of their jobs and of their responsibilities for reducing negative impacts". Other barriers to effective implementation are around organisational issues of culture, values and structures all of which are considered under the umbrella of commitment in ISO implementation terms (ISO, 2004; Arvanitoyannis, 2008).

2.5 ENVIRONMENTAL TRAINING

The ISO 14001 (2004) specification document highlights the role of commitment, competence and communication in effectively implementing the EMS. Commitment to an EMS is most effectively exhibited when human, capital and infrastructural resources are allocated to it. Competence to meet the requirements of the EMS is imperative and this is accomplished in the implementation of environmental training and awareness. The ISO 14001 (2004:14) identifies training requirements so as to establish competence as follows:

- Persons whose work could cause significant environmental impacts
- Identify training needs and training plan for implementation
- Ensure all persons are aware of the environmental policy, the ISO 14001 EMS and all environmental impacts and aspects of the organisations activities, products and services that are affected by their work. ref

In addition, “management should determine the level of experience, competence and training necessary to ensure the capability of personnel, especially those carrying out specialised environmental functions” (ISO 14001:14).

There is growing consensus on the importance of environmental training to environmental performance, where environmental training is seen as a crucial factor to successfully implementing an EMS, by influencing employee attitudes and behaviour to effectively innovate and initiate better environmental performance(Perron *et al.*, 2006; Sammalisto and Brorson, 2008).Environmental training is a burgeoning field of enquiry within environmental management with increasing academic attention as a precursor to effective corporate environmental management (Sammalisto and Brorson, 2008).An EMS is considered an initiative to implement sustainable development in a company and environmental training is considered a mediating tool to enable this (Siebenhüner and Arnold, 2007). The corporate context of the application of this the topic necessitates an exploration of the broader organisational discourse that this training practice is positioned within wherein is highlighted the organisational dynamics of knowledge management, organisational change adaptation and the link to environmental training to innovate and initiate greater levels for environmental efficiency in the company context (Halme, 1997; Teixeira *et al.*, 2012). Adaptation, innovation and learning cultures are interrelated concepts to advance employee behaviour in alignment with environmental strategies. These topics will be explored in greater detail in Chapter 3.

2.6 CONCLUSION

Sustainable development is pursued through various mandatory regulations and voluntary mechanisms, which is no more relevant than at the point of environmental impact -which is represented by business and industry. The interpretation and evolution of environmental management in corporate greening has grown significantly through the appropriation of the ecological modernisation approach which positions companies to maximise environmental opportunities inherent in cleaner production and integrate environmental management with wide ranging benefits to the environment and to corporate bottom line through resource efficiency and competitive advantage. Integrating environmental management into business is considered a change management challenge and environmental management systems are implemented to streamline adherence to environmental regulatory compliance and enhance proactive corporate risk management. Environmental training is an imperative cog in the

machinery of environmental corporate change and is an integral element of ISO 14001 which is implemented in an effort to proactively engage with the environmental crisis and challenges of regulation to protect the environment.

CHAPTER THREE: LITERATURE REVIEW

3.1 INTRODUCTION

Building upon the scope of the conceptual framework, this chapter takes a focussed approach on specific ideas in corporate sustainability that informs environmental training activities. There are various reasons for engaging with environmental training in the workplace, such as legislation; market forces and profit-opportunity; risk management as well as stakeholder pressures. This chapter explores these motivations in greater depth and looks also at the capacitating context of organisational learning, the role of change in cultural attitudes and values in making a meaningful transition into an environmental learning organisation. This chapter is a feat of scales, examining broad legislative and policy literature contextualising the legal mandate for this organisational activity as well as the environmental ethical traditions that give it rise and that which eventually also influences corporate ethics. The national policy orientation in the context of capacitating South Africa's skill revolution geared towards the green economy is also examined. The context of the legal duty of care interpreted within a skills development context necessitates the investigation of legislative legal compliance and the oxymoronic nature of compulsory voluntarism through corporate environmental management. The triple bottom line is explored further through the ideas of the green economy and how this necessitates an environmentally informed and progressive workforce.

3.2 ENVIRONMENTAL ETHICS

The 18th and 19th century Industrial Revolution initiated the emphasis of industrial activity to profit prioritisation, but pollutant effects of industrialism wreaked localised social and environmental injustices typically burdened by poor-class urban dwellers such that the first inklings of environmental issues where understood as pollutant activities that burdened the poor with ill-health and lowered living conditions(Lesourd and Schilizzi, 2001). The earlier writings of the 20th century sirens the injustices of discounted negative business externalities on the environment and society such as in Aldo Leopold's 1949 Land Ethic, the 1968 Hardin's' Tragedy of the Commons and Rachel Carson's' Silent Spring in 1962 (Glazewski, 2000; Lesourd and Schilizzi, 2001; Feris, 2009). All these late century authors highlighted the incongruence of economic activities that are void of environmental ethics to guide socially and environmentally responsible industrial behaviour. The topic of ethics which is a rich and

stimulating field entrenched in the discipline of philosophy cannot be expounded in all its complexity here, but has an established relevance in examining the response of business to the current environmental and social challenges (Welford, 1998; Eckersley, 2005; Benn and Dunphy, 2007; Naidoo, 2009).Randall (2013)expounds, that global societies, institutions and values represents an implementation of moral theory, underscoring that the debate and rhetoric of ethics can inform more relevant environmental policy formulation and communication across traditionally opposed business and environmental ethics.

3.2.1 Duty-ethics and Virtue Ethics

Environmental ethics is defined as the "system of moral principles by which the human treatment of natural ecosystems and wild communities ought to be guided" (Taylor, 1986 cited in Glawezski, 2000:6).Environmental ethics are rooted in philosophical traditions of deontology and utilitarianism (Des Jardin, 2001; Lesourd and Schilizzi, 2001;Eckersley, 2005). Des Jardin (2001) expounds that the 18th century philosopher Immanuel Kant's deontological tradition which is duty-based, that requires adherence to a categorical imperative that emphasises action on rational principles, and takes cognisance of rational individual actions that create predictable and acceptable present and future consequences. Kant's Universalism expressed that behaviour is ethical if it is rationally based on principles of duty that satisfies a categorical imperative (Des Jardin, 2001; Lesourd and Schilizzi, 2001). This tradition influences the decision making on principle and not solely on consequences. In comparison, the Utilitarian ethical tradition, based on the works of Jeremy Bentham and John Stuart Mill, considers the maxim of the greatest good for the greatest number as a rule where all acts or decisions are ethical if they benefit the greater number(Des Jardin, 2001).

The biocentric ethic, which can be considered a non- anthropocentric approach, is derived from a different tradition of philosophy known as virtue ethics (Des Jardin, 2001). Defining contributions to this environmental ethic can be traced to Aldo Leopold's *Land Ethic* which presents a nature-centred ethic. Central to Leopold's stance is the aspect of responsible human-nature relations. According to Leopold (1949: 224), "a thing is right when it tends to preserve the integrity, stability and beauty of the biotic community... It is wrong when it tends otherwise". In addition biocentric ethics advocated by Paul Taylors' 1986 *Respect for Nature*, makes the claim that "all living things have moral standing and we have duties towards them by reference to their inherent worth" (Taylor, 1986 cited in Des Jardin, 2001: 142). The

biocentric view defends a central intrinsic value of nature with a strong emphasis on the equality of species (Sterba, 2012). The biocentric approach is problematic for reasons relating to the determination of intrinsic value, what attributes defines this and normatively, for environmental policy relevance, the question remains debatable on " how much of nonhuman nature would be included in the circle of moral and legal protection, and more importantly, what character would that protection take" (Eckersley, 2005: 366).

It is important to note that the nuances of the implementation of these philosophical traditions often overlap. For example, a critique of Kantian ethics that influence anthropocentric approaches to law and political theories, often have Utilitarian caveats. This is evident in the application of the precautionary principle for example, which is a principle of sustainable development that has significant impact in environmental risk assessment as it pertains to businesses. Kantian's duty-based reasoning applies to avoiding unacceptable environmental risks to present and future generations as this is the reasonable response to the Kantian categorical imperative however the determination of the acceptability of the risk in often uncertain scientific terrain, remains a Utilitarian pursuit(Lesourd and Schilizzi, 2001).

The debated challenge over the utilitarian and biocentric perspectives span numerous arguments along the lines of determination of ecological value, conserving nature while persistent and environmental damaging conflicts remain in relation to human posterity and future generations (Callicot, 2012; Sterba, 2012; Russell, 2013). There is also particular focus on the ethical anthropocentric-leaning justification of sustainable development and its principles of intergenerational equity promoted through seminal political theorist and philosopher, John Rawls in his *Theory of Justice* published in 1971 and his subsequent elaboration in *Law of Peoples* (1999). Rawls political philosophy and moral ethics is arguably the most important political philosophical contribution of the 20th century where he presents in *A Theory of Justice*, moral guiding principles upon which the dictum "justice is fairness" is predicated, and is a defence of egalitarianism, consensus, political and societal fairness (Lovett, 2011). Rawls in *The Law of Peoples* argues his *savings principle* and *difference principle* which address with compelling but arguably incomplete application value, the motivation for protecting the environment for present and future generations(Rawls, 1999; Macclellan, 2013).Rawls comments that the anthropocentric interpretation of an environmental ethic that meets our human institutional needs of democracy and egality are as follows "the material base [including nature] of just institutions must include natural capital because environmental goods

and services are necessary for humans to establish and maintain just institutions" (Rawls, 1999: 255). More contemporary applied ethics takes full advantage of the anthropocentric approach inherent in sustainability discourses, for example, Russell (2013) contribution argues that a sustainability ethic guided by principles of autonomy, which is free and deliberative participation; stewardship, that is resource-management based; and subsidiarity, which entails deliberative cooperation across the global and local scales of the environmental problems. Sustainable development, it is apparent, is underpinned by similar ethical foundations.

3.2 .2Corporate Social Responsibility

Corporate social responsibility is considered the corporate response to changing social and political demands which have influenced ideas of ethically entrenched corporate governance (Clapp, 2005; Kashmanian *et al.*, 2010). Fourie *et al.* (2012), refer to the changing social contract between business and society based on changing societal expectations regarding holistic corporate behaviour that includes the environment, often argued as an extension of stakeholder theory. Corporate responsibility is not a new concept and dates back to the early industrial revolution, identified mainly through the issues around worker safety and health. The current wave of environmental concern can be likened to *Frankenstein* in terms of the fear and mistrust of corporate-profit driven science and technology(Smith, 1993). Often instigating the situation, corporations have legitimised environmentally damaging activities through the use of science and technology and this represents the traditionally held position of business which is to defend against these stakeholders groups to which limited responsibility is considered(Cox, 2006). There is a growing trend for businesses to accept wider responsibility to stakeholder issues in terms of environmental care and precaution. The trend is motivated, according to some authors, by enlightened self-interest(Smith, 1993; Meima, 1997).

Enlightened self-interest is a disguised attempt to parlay with public pressures and expectations in order to legitimise corporate business activities and to prosper it through indirect accrued benefits. However many authors contend that, corporate responsibility is about a move towards greater transparency and engaging with stakeholder interests and thereby creating and fostering a legitimate social contract to pursue business ends(Hazelton, 2009; Fourie *et al.*, 2012; Hanks, 2012).Corporate social responsibility a term well-worn with use historically has roots in corporate philanthropy. However, the broad and encompassing ideas of sustainable development, exceeds this perspective of business engagement. Furthermore, businesses may

very well find it difficult to address so broad a sustainability concept within their organisations, a concept that does not fit neatly into any one function or department (Blackburn, 2008).

Corporate greening, an arm of corporate social responsibility, represents the implementation nexus of business and environmental ethics(Naidoo, 2009). Ethics can be seen to guide corporate best practice in sustainability decisions for example, but many authors argue that the environmentally ethical business rhetoric is merely a front for the age-old self-interest of business profit maximisation in keeping with traditional business ethics (Karliner, 1997). As an example of misconstrued ethics, The Guardian in 2013 reported on Kelloggs and PepsiCo, considered dubious contenders by Oxfam, being awarded 'most ethical companies' by the Ethisphere Institute during which the following comment was made regarding this award, "There seems to have been a proliferation of awards. I wonder if some are undermined more by the fact that they're rather self-serving" (McEachran, 2013). In this sense ethics is a means to an end and, arguably, the 'end' has shifted to include environmental sustainability. Relevant to this, Lesourd and Schilizzi (2001) comments that environmental management has been pivotal in facilitating the business transition to ethical operations and has made cost-effective common sense to do so. There is therefore an evident influence of environmental ethics on business operations and governance with strong emphasis on the pragmatic application of ethical philosophy. For example, Eckersley (2005: 365), states that "from this pragmatist perspective, what we urgently need is not applied philosophy but rather practical philosophy – the coming together of a community of inquirers to discuss and resolve the practical environmental problems, drawing on local cultural resources".

3.2.3 Anthropocentricism

The impact of environmental ethics on business ethics, political ethics and environmental law is significant in shaping and continuing the dialogue and policy formulation of democratic institutions (Dryzek, 1997; Svensson *et al.*, 2010; Pitelis, 2013). Environmental law has been influenced by anthropocentric traditions of philosophy and materialise normatively as the approach of anthropocentricism which Des Jardin defines these as follows: Anthropocentric ethics holds that only human beings have moral value. Thus, although we have direct responsibilities regarding the natural world, we do not have direct responsibilities to the natural world" (Des Jardin, 2001: 11). Normatively the deontological and utilitarian response to environmental issues lies in the direct actions of rational and superior human intellect which

represents an anthropocentric approach that contrasts with non-human forms of agency, and value, having implications for environmental protection beyond utility (Des Jardin, 2001; Eckersley, 2005).

3.3 ENVIRONMENTAL LAW, DUTY OF CARE AND COMPLIANCE

Environmental Law and in particular South African environmental law and its legal norms are influenced by anthropocentric ethics. That is the protection of nature for maintaining a healthy biosphere for human life(Glazewski, 2000). Environmental law and its bearing upon the corporate response to compliance are investigated further in this section. Environmental law was briefly examined in Chapter 2 but at the risk of reiteration, an expansion of this is warranted in terms of the regulated corporate community within the context of legislated environmental rights, and the duty of care precedent of environmental law that enforces this. These attributes of environmental law affect how businesses function and frame the free-market with environmental opportunities and constraints. Apart from business related returns that are maximised through environmental management measures, compliance and enforcement requirements of environmental law present particular constraints and cost implications on business in the endeavour to regulate such impacts on the environment. In Chapter two, the NEMA as South Africa's first environmental framework legislation was examined with an indication of it inception and its effectual Constitutional mandate to manage activities on the environment. This section looks at the relevance of the NEMA to business compliance, enforcement and how environmental training is supported through this. In addition this section will give a clear indication of the legislative impetus for the compliance implications upon business that further necessitate an environmentally skilled workforce. The authors that bring significant insight into these themes are Fuggle and Rabie's seminal work presented by various authors including Van der Linde (2009) as well as the environmental law compliance and enforcement literature of Glazewski (2000) and Paterson and Kotze (2009).

South Africa is applauded for its progressive and vast environmental law embracing its democracy with voracity and contending legislatively with global climate and environmental challenges, however the successes in legislation, are outweighed by the response of non-compliance and weak enforcement(Kotze, 2009). In historical perspective however, non-compliance was characteristic of the pre-constitutional environmental legislative context in South Africa where enforcement of environmental law was impeded by the lack of a coherent

environmental framework(Feris, 2009).There are presently three legislative mechanisms in South Africa that afford protection to the environment. The three mechanisms as expounded upon by Van der Linde (2009) to include:

- The Constitution of South Africa (Act 108 of 1996);
- The environmental framework legislation in the National Environmental Management Act (Act 107 of 1998 as amended);
- The litany of environmental laws promulgated from the framework legislation to afford protection for various environmental media.

The Constitution ushered in a significant change to environmental law and its enforcement by entrenching the environmental right in the Bill of Rights in Section 24of the Constitution which guarantees everyone a right to a healthy environment but also mandates measures to secure these rights in Section 24(b)(Feris, 2009). This environmental clause in the Bill of Rights of the South African Constitution has particular bearing in accordance to Section 24 (b) on the legislative responsibility of government to secure these rights by 'legislative and other measures', protecting the environment itself from polluting impacts and to promote sustainable development (Glazewski, 2000). The legislative measure envisioned in the environmental clause of the Constitution is brought to bear in the national framework legislation of NEMA. In reference to Section 24(b), the NEMA therefore represents the Constitutional right to legislative measures of pollution control and sustainable development to secure an environment that is not harmful to human well-being(Feris, 2009). The framework legislation of the NEMA has facilitated the promulgation of various environmental sectoral legislations. The sectoral legislation takes into account specific impacts on environmental media namely that of air, water and land (du Plessis, 2009; Paterson and Kotze, 2009; Van der Linde, 2009). There is a growing body of South African environmental legislation which has been summarised from Van der Linde's (2006) compendium of environmental legislation and is presented in Table3.1. Though not comprehensive, the list is indicative of the weight of environmental law that pertains to regulation of activities that can impact on the respective environmental media. Due to the cross-sectoral implications of environmental legislation, of central relevance is the issue of environmental governance which is addressed strategically in the Constitution and the NEMA to be the bedrock upon which environmental compliance and enforcement measures are entrenched and the NEMA framework legislation can be achieved (Kotze, 2009).

Table 3.1: Environmental Legislation in South Africa summarised and adapted from Van der Linde (2006:20). *Researchers own tabulation*

National Environmental Legislation	
1. National Environmental Management: Air Quality Act (AQA), 2004 (Act 39 of 2004)	2. National Environmental Management: Integrated Coastal Management Act, 2008 (Act 24 of 2008)
3. National Environmental Management: Waste Act, 2008 (Act 59 of 2008)	4. Marine Living Resources Act, 1998 (Act 18 of 1998).
5. Sea Birds and Seals Protection Act, 1973 (Act 46 of 1973)	6. World Heritage Convention Act, 1999 (Act 49 of 1999)
7. National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004)	8. Mineral And Petroleum Resources Development Act, 2002 (Act 28 of 2002)
9. National Water Act, 1998(Act 36 of 1998)	10. Dumping at Sea Control Act, 1980 (Act 73 of 1980).
11. National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)	12. National Environmental Management Act, 1998 (Act 107 of 1998)
13. Protected Areas Act, 2003 (Act 57 of 2003)	14. National Forest Act, 1998 (Act 84 of 1998)
15. Occupational Health and Safety Act (Act 85 of 1993)	16. Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
17. Genetically Modified Organisms Act, 1997 (Act 15 of 1997)	18. Nuclear Energy Act 1999 (Act 46 of 1999)
19. Hazardous Substances Act, 1973 (Act 15 of 1973)	20. Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

The Constitution in Section 41 and the NEMA in Section 2 call for cooperative governance as a precursor to environmental enforcement and compliance (du Plessis, 2009). Intergovernmental cooperative governance has come under criticism as vertically and horizontally fragmented and thereby undermining the sustainable development principles of the Constitution and the NEMA (Kotze, 2006). Despite this, the Constitution in Section 41 details cooperative governance principles furthering integrated environmental management and in-line with this the NEMA established an array of statutory principles, planning frameworks and conflict resolution procedures in Section 2 (du Plessis, 2009). In Chapter 3 of the NEMA, procedures for environmental governance establish Environmental Forums and Environmental Implementation Plans (EIP) and Environmental Management Plans (EMP), as measures to ensure adherence to IEM and cooperative governance principles of the NEMA Chapter 2 (Glazewski, 2000). The previously-named national Department of Agriculture and Environmental Affairs (DAEA) has developed EIPs for example which are provincially

developed and the 2008 KwaZulu-Natal Provincial EIP in Section 4(DAEA, 2008) has stated the following areas of pressing environmental impact issues:

- Poor ambient air quality
- Unsustainable use of natural resources
- Loss of biodiversity
- Soil loss
- Poor protection of marine species
- Coastal erosion
- Poor wetland management
- Poor water quality
- Lack of proper sanitation
- Unsustainable energy use
- Poor waste management

In the context of pressing environmental impacts and degradation, Chapter 7 of the NEMA bears relevance to the overall compliance , enforcement and protection measures where Section 1 deals with Environmental Hazards and Section 2 with Information, Enforcement and Compliance(Glazewski, 2000). If government has a legislative duty to protect the environment to further the goals sustainable development and enshrined human rights, then the regulated activities of business for example, have specific duties to adhere to these legislative requirements.

3.3.1 Duty of Care and Environmental Training

Chapter 7 of the NEMA is contextualised within the Principles of Environmental Management according to Chapter 1 Section 2(1) which states that these principles are to guide the "interpretation, administration and implementation of this Act, and any other law concerned with the protection or management of the environment"(RSA, 1998.-a). Various authors agree that four of the several principles from Chapter 1 Section 2 (4) are of relevance in considering Chapter 7 of the NEMA (Kidd, 1997b; Van der Linde, 2009):

- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective

participation, and participation by vulnerable and disadvantaged persons must be ensured.

- Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.
- The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

With the environmental management principles in view, Chapter 7 of the NEMA deals specifically with compliance and enforcement and prescribes wide-reaching duty of care to potential and actual polluters. In the NEMA Chapter 7, Section 28(1) the duty of care is established as follows (RSA, 1998):

> *Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.*

This establishes a duty upon any person, business entities included, to prevent, minimise or rectify pollution or degradation. This is followed by specific measures to accompany this duty of care as is stated in Section 28(3) to include:

- Investigate, assess and evaluate the impact on the environment
- Inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment
- Cease, modify or control any act, activity or process causing the pollution or degradation
- Contain or prevent the movement of pollutants or the cause of degradation
- Eliminate any source of the pollution or degradation or
- Remedy the effects of the pollution or degradation.

The reasonable measures according to the NEMA Section 28(3)(b) is to "Inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment". Therefore, the legislative grounds for companies to pursue their duty of care towards the environment by providing requisite environmental training that constitutes a risk averse, preventative and precautionary response to the environmental duty mandate. There is therefore a legal imperative according to the NEMA regarding the prevention and remediation of pollution risk through effective environmental training in the workplace. Section 28(1) of the NEMA prescribes a duty of care which is applicable to businesses and is fundamentally predicated upon the NEMA Section 2 environmental management principles, namely, the polluter pays principle in Section 2(4), the preventative principle in Section 2(4)(ii), and the precautionary principle in Section 2(4)(a)(vii)(Glazewski, 2000). These are considered overarching principles in the legislative mandate of enforcement and compliance and have further relevance in good corporate environmental governance through sustainability measures adopted by companies through reporting initiatives such as King III, GRI, UN Global Compact and importantly in the adoption of the ISO 1400 EMS (Naidoo, 2009; Van der Linde, 2009).

3.3.2Corporate Liabilities for Environmental Damage

The NEMA Section 24(4) prescribes liability for environmental damage resulting from failure to take the measures stipulated in Section 28 (2) which are grounds for administrative directives which can include statutory liability and remediation costs (Glazewski, 2000; Feris, 2009). There are in addition the severity of penalties and imprisonment for contravening the NEMA Section 24F provisions for undertaking listed activities requiring environmental authorisations, as per Environmental Impact Assessment (EIA) regulations under the NEMA Section 24(1). Such illegal commencement of listed activities constitutes a criminal offense subject to a R5 million fine or 10 years imprisonment (or both) under section 24 F of the NEMA (Van der Linde, 2009).

Corporate entities are considered a major component of environmental liability as a result of corporate environmental offenses. Kidd (2009) contends that corporations are the focus of environmental related liabilities because among other reasons, they are primarily:

- Major source of environmental degradation as they handle the most dangerous types of pollutants.
- They are extensively economically and politically powerful and can therefore distort legal obligations.
- They benefit from free environmental services and a have the capital accumulation owing to this supply, which can be used to further prevent pollution.

Kidd (2009), further elaborates that the NEMA Section 34(7)(8) provides for *vicarious liability* which places direct responsibility for non-compliance with environmental law on Directors and employees. This provision applies to any offenses listed on Schedule 3 of the NEMA which details various sectoral National and Provincial environmental legislation that mandates adherence (RSA, 1998). In such an instance of non-compliance, the accused Director is placed with the burden proof and needs to show reasonable measures were taken to prevent the commission of the offense. The reasonable measures stipulated in Section 28 (3) of the NEMA represents the body of proof from which corporations can defend their position and these measures include, as point of reminder, educating and informing those responsible in business activities of impacts of such activities so to prevent and minimise environmental impacts and degradation as stated in the NEMA Section 24(3)(b). The Schedule 3 list of Acts that pertain to business compliance is therefore imperative to understand from a business point of view, in light of the of prosecutory sanctions referenced in Section 34 (7) of NEMA. Schedule 3 however is not exhaustive of environmental laws that have bearing upon corporate environmental compliance, which, as detailed in the Compendium of South African Environmental Law, show there are ninety six (96) pieces of applicable National Environmental Legislation and twenty two (22) pieces of KwaZulu-Natal Provincial Environmental Regulations (Van der Linde, 2006). Depending on the nature of business activities, an understanding of minimum environmental legal compliance to the sleuth of legislation as presented in Table 3.1 becomes imperative.

3.3.3. Environmental Law Enforcement

The enforcement of environmental law is through administrative and criminal sanction which is an effective deterrent to environmental pollutant and degradation activities. However as Kidd (2009), emphasises, respect for the rule of law is only as effective as its enforcement. Without proper enforcement, compliance to essentially paper threats becomes untenable. Non-compliance is an outcome of inherent and contingent weaknesses (Kidd, 2009:242). These

summarised regulatory weaknesses comprises of the prosecution time and cost burden, it is reactive, does not promote preventative measures to avoid harm, and requires comparatively more exacting burden of proof and therefore collectively presents constraints. Kidd (2009) further asserts that contingent weaknesses relate to a poorly formed environmental-societal value system to detect and investigate criminal environmental actions. Given these weaknesses, an alternative method to promote deterrence is considered through voluntary compliance.

3.4. ENVIRONMENTAL GOVERNANCE AND VOLUNTARY COMPLIANCE IN SOUTH AFRICA

"Sustainable development depends on good governance, good governance depends of the rule of law, and the rule of law depends of effective compliance. None is sufficient alone, but together they form an indivisible force that is essential for survival and for sustainable development" (Zaelke *et al.*, 2005 cited in Paterson and Kotze, 2009: 2). Several authors reflect similarly that traditional command and control measures of enforcement which are pursued through sanction measures of criminal prosecution of environmental non-compliant activities, are consistently considered inadequate in light of the demanding nature of this regulatory approach encumbered by complexity and the fast changing nature of the regulated environment(Durant and O'Leary, 2004; Lehmann, 2009; Kotze, 2009). Government alone, with its institutional fragmentation, poor intergovernmental integration, resource and capacity constraints cannot reasonably sustain the command and control approach to environmental governance and pursuant compliance mandates(Durant and O'Leary, 2004; Lehmann, 2009). Supporting these sentiments further is the consideration that "environmental compliance and enforcement mechanisms remain scattered across many different laws, which in turn are administered by an array of national, provincial and local authorities"(Paterson, 2009: 296). South African environmental governance is predominantly characterised by an emphasis on command and control measures also known as directive-based regulation as an enforcement mechanism(Lehmann, 2009). However, consensus in the literature suggests there is limited but exploratory avenues sought by government in market and incentive-based instruments to facilitate regulation and environmentally compliant behaviour in industry(Paterson, 2009). An example of this is the Energy Efficiency Strategy in South Africa that applies tax incentives to influence businesses to reduce energy use through efficiency measures. As stated in a Polity article supporting this, "the regulations on the allowance for the Energy Savings in terms of Section 12L of the Income Tax Act 28 of 1997 would be linked to the tax process of the South

African Revenue Services (SARS) and was aimed at encouraging businesses to continuously scale up or intensify energy efficiency enhancements"(Greve, 2015).

The consensus from several authors is that traditional regulation needs to be prudently coupled with alternative forms of regulation to foster innovation, and proactive business participation in pursuing sustainable development in keeping with environmental legislation(Gibson, 1999; Paton, 2000; Arimura *et al.*, 2008; Wurzel *et al.*, 2013). The alternative enforcement tool or also known as voluntary environmental compliance mechanisms are alternative means of corporate compliance and promote going beyond minimum regulatory compliance standards(Nel and Wessels, 2010). This is alternative presents an interesting trade-off between regulator and firms such that "regulation can prohibit and sanction worst practice, but it cannot secure best practice"(Lehmann, 2009: 272).

3.4.1 Socio-political Context of Regulation Options

Benn and Dunphy (2007), elaborate on the characteristics of command and control measures versus the somewhat idealised but compelling alternative compliance measures. The nature of command and control bureaucracy creates a non-deliberative, reactive and adversarial process between business and government and facilitates a litigious-ready civil society. Benn and Dunphy (2007) continue to explain that the nature of the environmental problems requires deliberation, collaboration, proactivity, and a process of social learning. Conventional bureaucratic administration is found wanting in a world of rapidly changing information on the complexity of environmental problems that clearly is not solvable by a single actor such as government alone. Therefore what is required is a collaborative effort across society through a deliberative and reflexive, results-orientated and knowledge sharing approach. The strengths and weaknesses of regulatory and voluntary compliance measures are summarised and is shown in Table 3.2. These differences are contextualised in a broader socio-political context and brief description is warranted before proceeding into the voluntary compliance arrangements. Two particularly dominant forms of representative democracy globally today are liberal economics and social democracy. Benn *et al.* (2007), expound on these showing that both these societal systems present specific limitations to promoting and centralising environmental sustainability agendas and concerns effectively within the state-corporation-civil society arrangements. Specifically, liberal economics which promotes the individualised, market driven economy with state involvement limited to maintaining free market. In this

system the state's role is to facilitate an efficient free market that will allow the integration of environmental priorities through market systems driven voluntarily by corporations and businesses. It is at this juncture, various authors confirm, that businesses intersect with the various pressures of consumers, civil groups and environmental activisms' to initiate and integrate changes that can be accommodated within the market place(Dryzek, 1997; Lafferty, 1998; Anderson and Leal, 2005; Sabel *et al.*, 2005).

As Benn *et al.* (2007)elaborates, social democracy promotes proactive involvement of the state to protect collective interests and is inherently distrustful of the free market system to achieve equitable and socially just outcomes, which to this end, promotes a more vigilant citizenry in terms of involvement in engaging and monitoring of the free market activities for the ideals of the common good. The common good, the environment in this instance, is often defined in anthropocentric terms. In addition, the environmental concerns of society can largely be limited to bureaucratic expert circles and prevents the lay concerns of society at large to engage meaningfully often resulting in weak sustainability.

Table 3.2: Governance differences between traditional regulation and voluntary compliance summarised and adapted from Benn &Dunphy (2007: 26). *Researcher's own tabulation*

Command & Control		**Alternative Voluntary Compliance**	
Strength	**Weakness**	**Strength**	**Weakness**
Effective in : reducing point sources of pollution, conservation efforts, Waste management,	Ineffective in reducing non-point sources of pollution and transboundary effects e.g. GHG emissions	Pollution Prevention approach Anticipatory approach to Pollution	Self regulation creates mistrust from stakeholders and regulators
Compliance to Constitutional mandate to protect the environment	Creates adversarial interactions with regulated business community	Effective communicative relationship with Regulators	Proliferation of voluntary measures, efficacy uncertain
	Inhibits innovation	Promotes resource efficiency and Innovation	
	Inflexible, slow and reactive, complex administrative delays in enforcement	Flexible and reflexive through stakeholder engagements	
	End of Pipe pollution control	Reduces resource and administrative burden on Regulators	
		Democratic Governance	

3.4.2 Voluntary Compliance Measures

Lehmann (2009) expounds convincingly on the range of alternative compliance methods along the spectrum of traditional regulation, co-regulation and self-regulation. Self-regulation through firm-specific approaches in the adoption of an EMS such ISO14001 are examples of this measure. Self-regulation is supported strongly by several authors through the adoption of an EMS to systematise environmental impact mitigation and prioritise sustainable business practices that result in a continuous virtuous cycle of environmental improvement and risk management, while also capitalising on resource efficiency, and securing competitive advantage(Morrow and Rondinelli, 2002; Gavronski *et al.*, 2008; Matuszak-Flejszman, 2009; Potoski and Prakash, 2013). There is also the pragmatic cost-effectiveness of self-regulation that makes it desirable by regulators and by firms, whereby firms can prioritise their environmental regulatory spending in a systematic manner with outcomes beyond minimum compliance and therefore government does not overextend its resources in compelling and enforcing legal compliance (Lehmann, 2009).

3.4.3 Industry Codes of Practice and Sustainability Reporting

Self-regulation can also be coupled with industry-wide adoption of codes of practice. ISO 14001 is a dominant voluntary measure of self-regulation in South Africa (World Bank, 2000; Darnall *et al.*, 2008).Although self-regulation through ISO 14001 does not prescribe standards of compliance it assumes minimum mandated regulatory standards will be maintained through the established and audited EMS (Prakash and Potoski, 2006). Complementing and integrating it into an EMS, is the industry-level approach as suggested by Lehmann (2009)which comprises of the adoption of industry specific codes and is considered the 'original' form of self-regulation. Freemantle (2008), elaborates on business governance response to adopt industry specific codes and standards that are material for their operational context in sustainability governance and these are represented in Table 3.3. Naidoo (2009), elaborates further that corporate sustainability is mandatorily entrenched and codified in the Johannesburg Stock Exchange (JSE) listing requirements for example, through the corporate governance reporting measures in the King III code of governance which requires sustainability reporting integrated into the traditional financial reporting structure. Sustainability reporting commits a substantial responsibility on firms to disclose their environmental performance and these are required additionally albeit voluntarily for example through the King III, the GRI, the Carbon Disclosure Project (CDP) and the JSE Sustainability Reporting Index (SRI) (Freemantle, 2008; Naidoo, 2009; Hawken, 2012; JSE, 2013). Sustainability reporting is an example of a type of

global dialogue. The idea that action can be facilitated primarily through global governance pressures has seen sustainability reporting become a voluntary must(Fourie *et al.*, 2012). The global dialogue is initiated and driven from global above institutions such as governments, corporations and NGOs and are represented by for example the GRI, The Global Compact, King III and many others are examples of global above and global below transparency initiatives(Blackburn, 2008).

The voluntarism of these reporting measures imposed or required of South African firms are considered industry best practice in corporate governance and therefore paradoxically represent a mandatory requirement if firms want to remain competitive and protect their reputational capital(Freemantle, 2008; Hawken, 2012).

Table 3.3: Corporate Sustainability Reporting and Industry Codes for Environmental Governance (Freemantle, 2008: 7)

UN Global Compact	**KingIII (2010).**	**Carbon Disclosure Project**
(2000). Adopt 10 operational principles including environmental practices	Corporate Governance standards and practices. Integrated Sustainability Reporting requirement.	(2007). Major firms required to disclose GHG emissions & carbon strategies
GRI (2006)	**JSE SRI (2004)**	**CERES (1997)**
G3Guidelines of sustainability reporting**.**	Listed Companies report on sustainability & governance annually	10 point corporate environmental conduct code. Individual companies endorse it & apply its principles

3.5 GREEN ECONOMY AND SKILLS DEVELOPMENT: SOUTH AFRICAN POLICY CONTEXT

3.5.1 Ecological economics

The field of economics as practiced today is driven by neoclassical ideas of capitalism which is limitless growth, enabled by a democratic government with Keynesian involvement in maintaining a free market (Dryzek, 1997; Anderson and Leal, 2005;Turpie, 2009). This is seen to ultimately bear the greater good to the greater number. This view has had many detractors in history which persist today given the unfavourable environmental and social conditions wrought by unchecked limitless growth, where the environment is narrowly considered a source or input of resources and limitless growth is achievable with advancing science and technology (Klitgaard and Krall, 2012; Kosoy *et al.*, 2012). Clearly, it is argued, this model has

outgrown the devastating social realities of unequal distribution of the greater good and limitless growth restrained within a finite earth, and now compromised biosphere and devastating climatic conditions to support it (Lafferty, 1998; Brown, 2011). Therefore the challenge of sustainable development rests largely on forging a new direction and adaptive ideas of capitalistic growth(Brown, 2011; Haque, 2011). The growing field of ecological economics has informed this adaptation largely as has been acknowledged in the outcomes and proceedings in Rio+20(Morrow, 2012). These ideas are also concisely presented byTurpie (2009: 36), who states that "economic growth requires an increase in throughput, but since the ecosphere is finite, if the economy grows too large it will consume its support system and both will collapse....once a maximum desirable level of throughput is reached, the emphasis should be on development that improves the output per unit throughput as well as equity in terms of distribution of output." The idea of green growth is therefore gathering momentum and is centred on the ideas of ecological economics.

Ecological economics takes a different view of the environment from neoclassical economics. The environment is seen to encompass economic activity and limits its activities within the finiteness of the earth's ability to supply resources and absorb the waste output of economic production systems (Klitgaard and Krall, 2012). Therefore the environment is a determining factor and not just an input in the neoclassical sense. The costs of these natural resources as natural capital is more clearly accounted for and not limited to being an externality, within ecological economics (Lesourd and Schilizzi, 2001; Turpie, 2009). As agreed by Jouvet and de Perthuis (2013), the green economy is distinguished by a direct valuation of natural capital and natures services as having economic value and a full cost accounting regime in which costs externalised onto society and ecosystems are reliably accounted for as liabilities. The environment offers goods and services that have an economic value and these ideas have been well established in the environmental and resource economics discourse (Lovins *et al.*, 2000; Turpie, 2009). Notably, the scale of the green economy challenge is considered as the greatest economic transformation of our time since the industrial revolution (Haque, 2011; Martin *et al.*, 2011). The shifting focus globally to green economy has significant social implications in the areas of training and equipping a workforce to the new demands of green goods and services.

3.5.2 The Green Economy

Conceptualised here are the ideas of a green economy that harnesses a triple win in terms of sustainability, equity, and social development (Allenby, 2012; Morrow, 2012). A green economy is envisioned as one that still operates in the neoclassical paradigm of economic growth to advance economic development but in a way that capitalises on ecological and environmental protection measures through innovative and adaptive green technology, an environmentally adjusted market and restructured economy (Martin *et al.*, 2011; Musango *et al.*, 2014). This new green deal highlights the shift in greater emphasis on ecological economics and the internal accounting of ecological services previously discounted, including a revived global economy less dependent of non-renewable resources such as crude oil and with the overarching aim of uplifting the impoverished majority globally (Bauhardt, 2014).

The green economy is defined by the United Nations Environmental Programme (UNEP) as, "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities"(UNEP, 2013: 9).Notwithstanding significant international impetus for globally greening economies, the UNEP has been at the forefront of this initiative through the most recently held Rio+20 (UNEP, 2013a). The green economy has taken centre stage in current policy and development agendas specifically in South Africa. The reason for this has been established by the meeting of two historically polar social needs, namely, economic growth and environmental protection. As stated in the Department of Environmental Affair's (DEA) 2010 Green Economy Summit Report, the definition offered is a "system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks or ecological scarcities"(DEA, 2010b: 5). The promotion of the green economy supports the advancing of economic growth and much-needed employment opportunities to South Africans which it is estimated "will enable an environmentally friendly economic and employment growth on the same, or a greater, scale than current environmentally unsustainable growth" (Borel-Saladin and Turok, 2013: 1).South Africa has embarked on a New Growth Path established in the signing of the 'Green Economy Accord' in 2011(Department of Economic Development, 2011b). The goals of this endeavour are stated as follows, "South Africa has a unique opportunity to create jobs on scale and address the concerns about climate change through a partnership to promote the green economy and processes to the green economy. The New Growth Path sets a goal of five

million new jobs by 2020. It projects that with the right policies and cooperation, large numbers of green jobs can be created" (Department of Economic Development, 2011b: 6).

The South African Green Economy Accord which aligns the country's economic development strategy of a New Growth Path, leverages a green economy to achieve sustainable development and large-scale employment outcomes, has stated support of this transition, " South Africa has a unique opportunity to create jobs on scale and address the concerns about climate change, through a partnership to promote the green economy and processes to green the economy"(Department of Economic Development, 2011b: 6). Pojasek (2010: 83), heralds this as a triple win of "people, planet and profits" which is seemingly more achievable in the green economy model by securing lower carbon-intensive industries, higher employment and ultimately reducing greenhouse emissions and abating climate change. This is further supported by the Energy (R)evolution study scenario presented by Green Peace Africa for South Africa, which predicted that at least 78000 jobs can be created in the renewable energy sector in 20 years which is incrementally more than non-sustainable job creation options (Rutovitz, 2010).According the Global Green Economy Index (GGEI) Report, South Africa ranks 22nd globally in the Green Economy Performance Index which is second to Brazil in consideration of South Africa as part of the BRICS (Brazil, Russia, India, China and South Africa)(Tamanini, 2014). BRICS is the grouping of emerging economies representing 40% of the world's populations(Glitz, 2013).

Furthermore, Tamanini (2014: 18)states a transition to a green economy "will require significant public and private investment, as well as a commitment from national leaders to promote the right mix of fiscal incentives to accelerate green growth". The jobs envisioned in the Green Accord are in the sectors of manufacturing, construction, and renewable energy. Government expenditure on the environment in a recent 2015 Budget Speech report shows a total of R590 million has been allocated to the Green Fund over the medium term, for strategic environmental projects in partnership with the private sector(Nene, 2015: 10). Furthermore, according to the Department of National Treasury, the DEA has an allocation of R11.8 billion to fund more than 107 000 full time equivalent jobs and 224 000 work opportunities through environmental programmes (Nene, 2015:10).In addition, according to the Green Accord, the financial commitment by the Industrial Development Corporation (IDC) is R22 billion over the five year period until 2016 for green projects and R3 billion for manufacturing green products(Department of Economic Development, 2011b: 19).The allocation of funding for a

green economy is supported by the Organisation for Economic Co-operation and Development (OECD) and has affirmed that the budgeting of green development in national policy is a positive indicator of environmental integration into the economic plans of the country(OECD, 2012).

3.5.3 The National Policy Context for a Green Economy

The emergence of the green economy as a key driver for economic development shows strong alignment across national public policy arena to coordinate a nationwide policy effort to give effect to the economic strategy of the New Growth Path enshrined in the National Development Plan (NDP) (National Planning National Planning Commission, 2011). The NDP (2011) recognises that a new economic story is being written for South Africa to address persistent poverty and unemployment in a sustainable context of environmental stewardship through the green economy transition. The UN Green Economy Guidebook confirms the international urgency to embrace the green economy by stating that, "Perhaps a key benefit of the emergence of the green economy concept has been that it has stimulated international attention and renewed global efforts to transform our current unsustainable economic model into one which better aligns with the overarching goals of sustainable development"(Allen and Clouth, 2012: 62). The Green Economy Accord has a strong focus on energy efficiency and technological advancement opportunities in green manufacturing and green buildings. The Green Accord has garnered varied support according to the Mail & Guardian news report, which highlighted the potential to see the Accord as green washing based on the repackaging of old policies in new rhetoric conveniently shortly before the 17th Conference of the Parties (COP17) to the UNFCCC in Durban (Parker, 2011). However the news report conceded that wide stakeholder participation facilitates accountability and success is likely because of it (Parker, 2011). However, the Human Sciences Research Council (HSRC) in tracking the progress of the Accord since 2011, report that the results are piecemeal and not promising at present in terms of job creation, solar water heater installations or energy efficiency targets (Seelinger and Turok, 2013). The report criticises poor government capacity to make good of the ambitious Green Accord and also comments on greater business cooperation with energy efficiency targets and investment into green industries.

In terms of skills, the Green Economy Accord shows its support of skills development to support this initiative as stated, "Building of capacity through skills development of company

employees to implement energy efficiency programmes and drive the required behavioural changes in and outside the workplace" (Department of Economic Development 2011:28).The support of skills development is further evidenced by several national legislative and policy changes that have been developed in support of the New Growth Path. Table 3.4 specifically reflects the policy landscape which pertains to the New Growth Path and the skills development policies arising from it. South Africa's economic new green growth trajectory has been integrated with the sustainable development principles enshrined in the Constitution and in NEMA, drawing on cross-cutting national policy and environmental skills strategies. Public sector governance is critical due to the cross-cutting complexities that traverse various national departments that are featured in these specific policies. Sustainlabour (2013: 10) states that one of the major challenges for green economy initiatives lies in coherence among multiple policies and coordination among the multiple departments and other stakeholders responsible for implementation, which is also a case for South Africa. All these policy actions share a synergy in the environmental dialogue of South Africa and the remainder of this section attempts to make explicit these arrangements and assess their congruency regarding the environmental skills and training imperative relevant to the business sector.

Table 3.4: National Policy Context for Environmental Skills Development (adapted from UNEP, 2013b:11)

South African Policy Context for enabling Environmental Skills Development		
National Development Plan, Vision 2030, 2011	National Skills Development Strategy III, 2011	National Strategy for Sustainable Development & Action Plan, 2011
Green Economy Accord, 2011	10 year Innovation Plan, 2007 and Global Research Plan, 2010	Industrial Policy Action Plan, 2013
Environmental Sector Human Capital Development Strategy, 2009	DEA Strategic Plan for the Environmental Sector, 2009 DEA Environmental Sector Skills Plan, 2010	Integrating the Environmental Driver into Sector Skills Plans: Enabling Document for all SETAs, 2010

Two of the key priorities of the NDP are to transition to a low-carbon economy and to improve the quality of education, training and innovation (National Planning National Planning Commission, 2011). There is an established consensus between aligned national skills policies that require significant environmental skills in a rapidly emerging environmental sector and is

supported by aligned national policies (OECD, 2012 cited in Allen and Clouth, 2012). In support of this policy-driven new green economy path envisioned by the NDP, one of the key challenges is skills development to meet the changing direction of national economic strategy. The Department of Higher Education and Training(DHET) has spearheaded the skills revolution and recognised the environmental knowledge and skills gap that has been sufficiently stressed in the National Skills Development Strategy (NSDS III) (DHET, 2011). A key consideration motivating for a deliberate skills plan is to affect the outcomes of sustainable development at large within the private sector showing clearly the national imperative to strengthen environmental skills and training in the private sector and among the country as a whole. The NSDS III, confirms that the mainstreaming approach implies that skills development initiatives need to be extensive and comprehensive enough to support the integration of environment into development across the state and in all spheres of private and civil society(DHET, 2011). The DEA has been instrumental in aligning skills strategy to the green economy and to address the effort to mainstream the environment related skills across sectors through several policies including the following:

- National Strategy for Sustainable Development and Action Plan (NSSD 1), 2011
- Integrating the Environmental Driver into Sector Skills Plans: Enabling Document for all SETAs, 2010
- Environmental Sector Skills Plan (ESSP), 2010
- Environmental Sector Human Capital Development Strategy (HCDS), 2009

The NSSD1 has been developed as an implementation strategy for the 2008 National Framework for Sustainable Development (DEA, 2011b). The relevance of the NSSD1is the linkage to skills priorities necessitated by specific industrial action plans such as the Industrial Implementation Action Plan (IPAP2) (2013) and the 10 Year Innovation Plan (2008)(DEA, 2011b). The NSSD1 has planned to influence the manufacturing sector that is "aligned with these plans with specific interventions and instruments in terms of green industries, industrial efficiency and the manufacturing aspects of the green economy; South African Renewables Initiative (SARI) and the Environmental Goods and Services (EGS) Sector"(DEA, 2011b: 27). In line with this, the NSSD 1 outlines as one of its strategic environmental sustainability priorities for skills development through "implementation of programmes in research, awareness, training, skills development and knowledge management" (DEA, 2011:26).

The development of human capital has been recognised as critical in forging South Africa's path to a sustainable future and the New Growth Path of a green economy as the need to align green economic development with an adequately skilled citizenry especially in the workplace is evident in the national drive to develop, manage and intensify the environmental skill set of South Africans. The NSDS III, ESSP and Environmental Sector HCDS have been instrumental is grounding the environmental skills and training imperatives that are informed by various national policy goals(DEA, 2009a; DEA, 2010a; DHET, 2011). The NSDS III , for example, is influenced by the New Growth Path and related environmental policies has made explicit for the first time in it is three iterations of the strategy, the importance of the environmental skills development in the country. The NSDS III makes the distinction between green occupations and green skills. The former is critical occupations required to materialise and drive the green economy. The latter, which has particular relevance, is the green skills required in the process of a greening economy through the following impact focused skills that are required in industry as follows (DHET, 2011: 138):

- Development and adoption of renewable sources of energy
- Reduction of consumption of energy, fossil fuels and raw materials
- Enhancing energy and resource efficiency
- Reducing greenhouse gas emissions
- Decreasing of waste and pollution
- Recycling of materials
- Preventing the loss of biodiversity and restore ecosystems

The NSDS III is a framework for sectoral skills planning and gives direction to the implementation of the Sector Education Training Authority (SETA). SETA delineates the economic sector for the purposes of carrying out its mandate from the National Skills Development Act of 1998, the pertinence of which enables a systemised administration of national green skills, strategies and funding mediated through the workplace context (DHET, 2013). However, the NSSD III progress report for the period 2011 – 2013, shows there remains a need, despite the various green economic policy contributions, for a National Green Skills Strategy in the form of a National Green Skills Development Policy; National Green Skill Framework including the development of National Standards for Green Skill Instruction and up skilling of occupational trainers (DHET, 2013b). At the sectoral level the SETAs are

recommended to develop a green skills programs and national standards through the various national policies as discussed further in this chapter.

3.5.4 Skills Development Institution: The SETAs

The cross-cutting nature of the environmental skills education administration lies in the institutional structures provided through the Department of Higher Education and Training (DHET) which has taken over various related legislative skills competencies from the Department of Labour in 2009 (DHET, 2011). The SETAs have been subject to significant criticism but are required in the skills revolution underway in the New Growth Path (Akoojee, 2012; Turner *et al.*, 2013). However the NSDS III recognises the role of the SETAs as stated, "SETAs are such important institutions and will have such an important role in the NSDS III implementation that it will be impossible to ignore poor performance in the coming period"(DHET, 2011: 24). The role of the SETAs in facilitating the requisite skills demands in the green economy has gained momentum and this will be discussed further in this chapter. This view of SETAs and other institutional arrangements for environmental training in the workplace is necessary to the broader context of accreditation of Training Providers and the ultimate trickle-down effect this has on employers in the business sector that will use these services to further environmental performance and meet their environmental compliance obligations.

The following pieces of legislation underpin the SETAs, and are relevant to examine skills development and training structures provided:

- National Skills Development Act 1998 as amended
- National Qualification Framework Act 2008
- National Skills Development Levies Act 1999 as amended

The National Skills Development Act of 1998 as amended, in Section 9(1) established the SETAs for the overall purpose of skills development of employers and employees(RSA, 1998.-b). There is an intricate relationship that currently exists for advancing environmental- related workplace learning that relates to generic workplace learning institutions established through SETAs in terms of skills levies, skills grants, national qualifications and the use of accredited Training Providers (McGrath and Akoojee, 2009; Turner *et al.*, 2013). This relationship is illustrated in Figure 3.1 (with acronym definitions), and has been surmised from the national skills legislation such as the National Skills Levies Act 1999; The National Skills Development

Act 1998, and the SETA Regulations 2012. According to the National Skills Levies Act of 1999, employers are required to pay a Skills Levy if their payrolls exceed R500 000, payable to their respective SETA collected through SARS(SARS, 2014: 9). There are 21 mandated SETAs across the country as shown in Appendix 1(SAQA, 2012b: 7). Skills levy-paying employers are eligible to apply for an annual Mandatory Skills Grant and Discretionary Skills Grant as per the SETA Grant Regulations of 2012 (DHET, 2012c). The importance of the levy-grant system is to incentivise workplace learning that coincides particularly with critical scarce skills and workplace learning that results in a National Qualifications Framework (NQF) rated qualification for the workplace learner (DHET, 2013a). The supply of NQF part and full qualifications in terms of environment is arguably currently insufficient especially in the context of short-course dominated workplace learning training demands from employers (DEA, 2010a). Employers are nonetheless incentivised by the levy-grant system to use SETA-QCTO accredited Training Providers (DHET, 2012a). The point of contention arises in the misfit between NQF unit standards available to employers (and their Training Providers) and the environmental training, for example, that they actually require in the workplace. In other words a supply and demand misalignment is the contention of the current environmental workplace skills development landscape (DEA, 2010).

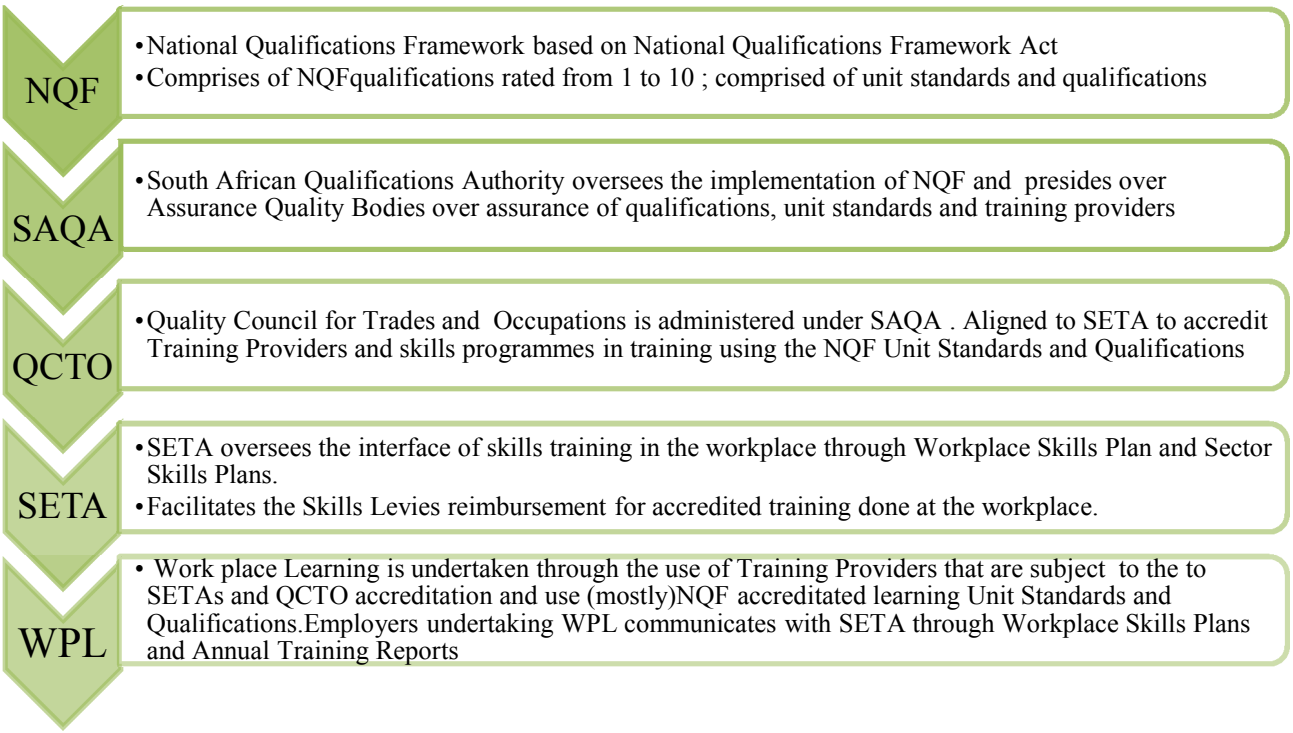


Figure3.1: The institutional arrangements for skills development. *Researchers own tabulation.*

In part, the SETA-workplace interface is facilitated through the submission of workplace skills plans and annual training reports by employers, which is aimed at creating a dialogue on workplace skills demands that can be informed by NQF programmes and qualifications within the public FET colleges and university providers(DEA, 2010a; DHET, 2012a). The SETA Guideline communicates a distinct discouragement of the proliferation of low NQF rated short courses that is dominated by use of private Training Providers (DHET, 2012a). On the other hand various authors have argued the case for private Training Providers who offer non NQF rated, short courses which meet industry and job-specific needs, with quick learning cycles and customised training material (McGrath and Akoojee, 2009; Akoojee, 2012; Turner *et al.*, 2013). This has come under the spotlight of the strategic planning policies currently as insufficiently meeting critical skills needs at a broader macro-economic level (DEA, 2010). Again, there appears to be a misalignment of the workplace skills demand that is contrary to national skills development objectives.

The incentivised levy-grant system is maximised when employers utilise the SETA and assurance quality systems such as the QCTO for acquiring their accredited training services through the use of QCTO -registered and accredited Training Providers offering QCTO - accredited skills programmes comprising of NQF unit standards or qualifications(DHET, 2012a). The skills levy system is established through the National Skills Development Levies Act of 1999 and is aimed at promoting employer commitment to national skills development and is incentivised through the skills tax reimbursement structures available to SETA registered employers. Of further relevance, is the accreditation of training providers and their respective course offerings which have to undergo a complex albeit recently streamlined accreditation process under the amended National Skills Development Act 1998 in Section 26G establishing the new quality assurance body of the QCTO(DHET, 1998). According to a DHET Communiqué, confirms the streamlining of the accreditation process of Training Providers through the QCTO Assuring body (DHET, 2012b). This move by the DHET is received with varied enthusiasm where on one hand it offers an opportunity to better administrated accreditation to Training Providers but its inception has been the subject of SETA neglect and is further emphasised by the NSDIII that "SETAs must become recognised experts in relation to skills demand within their sector. Their role in helping monitor quality on the supply side remains, but will reduce as other institutions, such as the QCTO, are established"(DHET, 2011: 3).

3.5.5 The Environmental Sector Skills Plan and the Human Capital Development Strategy

With the SETAs contextualised, the other policy documents that relate to skills training presented in Table 3.4are examined further. The ESSP is a strategic document that assesses and presents the status quo regarding environmental skills demands and critical skills in the environmental sector (DEA, 2010a). The aim is twofold. One is to provide direction forward on environmental skills development that can be used in various sectoral Human Capital Development Strategies (HCDS) for example and the second is to assist the mandated sectoral skills body, that is the SETAs, to mainstream green skills into the SETA Sector Plans (DEA, 2009a). As noted by the ESSP, skills development is administrated through the SETAs and there is not yet an established Environmental SETA and therefore this ESSP contribution is important for mainstreaming the environmental mandate (DEA, 2010a). The ESSP also takes a strong position and calls for greater integration of the environmental driver into the NSDS III, and has a poor report of the SETAs in fulfilling its functions as an environmental training resource body. Workplace learning (WPL) environmental skills needs are not adequately met within the SETA accredited courses and WPL is has been characterised in the country as generalist, provider driven, reactive, short-course dependent, and comprising low NQF levels courses (DEA, 2010a). The ESSP further criticised the SETAs as inefficiently equipped administratively; and in need of relevant environmental course content for specialist environmental training needed by various business and industrial employers. In the ESSP it is also recognised that employers obtain specialist environmental training outside of these institutional skills arrangements and skills levy provisions of the SETAs. Use of such training is considered an additional unclaimed tax burden on companies making environmental training more costly. An example of this is evident through the non-accredited course offerings of the Institute of Waste Management of Southern Africa (IWMSA), who developed a Waste Management Program that is in-depth and industry specific but falls outside of the mainstream NQF SETA system of accreditation(IWMSA, 2014). Furthermore the ESSP highlighted that limited environmental training is being offered by mainly 4 out of the 21 SETAs. Table 3.5shows extrapolated NQF unit standards or courses that are available to SETAs and registered Training Providers. These courses were gleaned from a precursory search into the NQF qualifications database available through SAQA and although it is not exhaustive, it does reflect in part the limited environmental qualifications offerings for workplace learning that have been highlighted in other policy documents such as the ESSP (SAQA, 2012a). However, the Education, Training and Development Practices Sector Education and Training Authority (EDTP) SETA has identified in its recent Sector Skills Plan, that private Training Providers

have not shown significant interest in promoting green course content and recognise it as a skills gap that must be addressed particularly in reference to the NQF qualifications as shown in Table 3.5(DHET, 2013a). The purpose of increasing green course content is to increase adoption and awareness of these training standards which can potentially increase workplace skills in environmental competencies (DHET, 2013).

Table 3.5: Environmental Unit Standards available through the NQF extracted from SAQA database(SAQA, 2012a)

Qualification: Environmental Practice. NFQ Level 2 Comprised of the following environment-related Unit Standards
Understand Nature Conservation issues
Separate, handle, store, treat and transport waste
Operate waste disposal facilities
Monitor water quality
Demonstrate knowledge of water cycle, water and wastewater systems and processes
Apply environmental management tools to assess impacts

The ESSP (2010) makes reference to the environmental sector which includes the private sector, represented by various SETAs (Appendix 1). According to the ESSP (DEA, 2010a), the environmental sector is defined by a broad environmental focus with the skills deficits that characterise this sector as shown in Table 3.6. The importance of the environmental sector has been outlined in an earlier DEA's Strategic Plan for the Environmental Sector (SPES, different from the ESSP) (DEA, 2009:11) document stating, "So the strategic importance of the sector is unquestionably linked to its role in ensuring sustainable development, through promotion of the benefits of a green economy and green jobs for decent work and upliftment of people, as well as protection of the natural resource base upon which the economy of the country and the well-being of its population depend". It is notable that each of the current 21 SETAs does not exclusively represent the environmental sector as delineated in Table 3.6. This ambiguity further emphasises the rigorous multiple policy calls to mainstream green skills in the DEA's Environmental Sector HCDS (DEA, 2009). The call to mainstream the environmental driver into employment and skills development at the workplace are contextualised further in the DEA HDCS(DEA, 2009).Interestingly, the integration of the policy context for the purposes of green skills development has resulted in the establishment of the DEA Sector Education and Training and Development Unit and allied Environmental Skills Forum(DEA, 2015).

Table 3.6: The ESSP delineated Environmental Sectors and Current Skill Needs (DEA, 2010a:6 & 22)

National Environmental Sectors	National Environmental Skills Needs
• Air Quality • Waste and Chemicals Management • Pollution Incident Management • Environmental Impact Management • Conservation and Sustainable Use of Biodiversity, • Marine and Coastal Management • Environmental Law and Compliance • Environmental Education, Training and Community Empowerment	• Environmental Law & Public Policy • Integrative skills programmes • Mentoring and coaching • ICT skills programmes, including use and interpretation of GIS and modelling technologies • Sustainable development planning • Monitoring, modelling and evaluation of environmental change • Green procurement and green economy planning skills • Environmental ethics and social justice practices in the environmental sector.

The HCDS is contextualised by the SPES which precedes the ESSP but together informs the Environmental Sector HCDS(DEA, 2009a). The SPES has identified capacity as a skills challenge in terms of enforcement and compliance within the regulated business community, and a skills gap has been identified, in the need to provide training to promote voluntary compliance programmes towards environmental regulations (DEA, 2009b). The SPES has outlined the details of the environmental sub-sector skills needs and this has been consolidated by the DEA HCDS and is shown in Table 3.7. Furthermore, the ESSP (2010) highlights the systemic need for environmental skills capacity for the fast changing policy and institutional environmental landscape. To address this skills gap, the DEA HCDS (DEA 2009:1), finds relevance and applicability to implement the ESSP as "they indicate the need for a systemic approach to addressing human capital development needs for the environmental sector." Due to the complex skills needs necessitated by a green economy and subsequent policies, the DEA HCDS is a systematic response to address this complexity of demands and supply of required environmental skills.

The HCDS makes reference to the larger cross-cutting green growth and climate change skills needs that require up skilling across the public and private sector (DEA, 2009). It also concedes the content of the skills deliverables for this is still a work in progress. According to the DEA (2009a), there is currently a neglect of environmental skills in workplace skills planning processes. The SETAs have been identified in the HCDS with greater attention to

their role in facilitating workplace learning that meet the environmental sectors' skill demands as outlined in this chapter.

Table 3.7: HCDS identified Environmental Training Skills Needs. Adapted from the HCDS (DEA, 2009:26-29)

Environmental Sub-sector	Skills Development Requirements
Waste Management	• Application on NWA & IWMP • Waste Avoidance and Recycling
Air Quality Management	• Avoidance and reduction of emissions from industrial sources, landfills, incinerators, household chemicals and transport logistics. • Capacity building for AQA licensing responsibilities
Pollution Incident Management	• General training programs on pollution incident management, risk reduction
Environmental Impact Management	• Improved scientific, decision making and report writing skills • Training in wider range of IEM tools • Compliance monitoring skills training • Regulations and application of IEM administrative systems • Public participation and understanding of EIA processes and regulations
Compliance and Enforcement	• Improved & pro-active compliance monitoring and capacity • Improved & pro-active compliance monitoring and capacity

There are great expectations on the DEA to spearhead this HCDS plan but the SETAs are also identified regarding their role through assistance in the objective to "develop guidelines for a co-ordinated workplace learning approach to environmental training programmes and guidelines for Training Providers" and "SETAs to initiate and support development of training programmes that address critical skills and environmental mandates using a co-ordinated, workplace learning approach" (DEA, 2009b: 38). A further important objective is to "initiate and support development of training programmes that address critical skills and environmental mandates using a co-ordinated, workplace learning approach" (DEA, 2009b: 38).

3.5.6 National Skills Forum and National Environmental Skills Summit

In further support of the ESSP and HCDS, the establishment of the DEA's Sector Education and Training Unit and National Skills Forum, in collaboration with partners such as GreenMatters, convened the National Environmental Skills Summit (NESS) in 2012 and presented two relevant declaration statements of its resolve by focusing on environmental skills and training (GreenMatter, 2012: 2):

- Make explicit the people dimensions in all sustainability and green economy deliberations and give skills, education and training much greater emphasis and importance;
- Design a new system for knowledge creation, education and learning, so we can access and work effectively with new knowledge; and where necessary change systems in Higher Education, in partnerships with employers, to meet the country's skills needs and drive employment

NESS has since convened in March 2015 and in the NESS Summit Report emphasised the role of The National Skills Forum tasked with an "an oversight role for the actions arising from NESS; to grow and expand its mandate as appropriate; and to explore ways in which to achieve greater organisation and professionalisation in the sector" (DEA, 2015: 7). The roles of the SETAs in environmental skills promotion in the workplace interface was further emphasised, "SETAs are slowly moving to include environmental skills in their SSPs, but the extent to which this is happening in actual training is minimal because Annual Performance Plans are approved through Boards where the environment is not represented"(DEA, 2015: 12). There is therefore a deliberative policy context for environmental skills training focused on the workplace, with greater emphasis being placed on the SETAs and the DEA to mobilise and action national environmental skills priorities. An example of this impetus is The National Environmental Skills Forum under the DEAs Sector Education and Training Unit, which has recognised the green skills gap as an obstacle in the business pursuit of sustainable development. The implementation of the ESSP and HCDS is recognised as a government priority and this is highlighted by the DEA, stating the "failure of environmental agencies to take up these opportunities" offered through the DEA's National Environmental Skills Forum, the ESSP and HCDS could "render them unexplored or under-resourced" (DEA, 2015: 1).

3.6 ENVIRONMENTAL TRAINING

As established earlier in this chapter, firms are compelled to conform to a wide stakeholder base of interests and pressures, including that from an environmental legislative and regulatory context. In addition, several authors agree that firms are faced with an environmentally progressive performance ideal such as those encouraged through the adoption of an EMS like ISO 14001 or through conformance with industry standards of best practice in sustainability reporting, energy efficiency targets or the adoption of pollution prevention technologies (Visser, 2002; Delmas and Toffel, 2008; JSE, 2013; Jabbour, 2013a; Maubane *et al.*, 2014). Similarly several authors find that firms are a focal point for environmental management as a response to the institutional, national, and in many cases, international, context of sustainable development (Levy, 1997; Welford, 1998; Mawhinney, 2002; Delvin, 2011).

Environmental training supports Proactive Environmental Strategies (PES) that are characteristically voluntary in nature (and includes ISO 14001) and provides a corporate response to increasing environmental regulation pressures for compliance and stakeholder demands for sustainable products and services(Vidal-Salazar *et al.*, 2012). Furthermore this is firmly positioned with an environmental management approach as considered by some authors stating, "environmental management is the incorporation of concern and environment-related opportunities in a business context, making production processes and products more environmentally suitable"(Haden et al, 2009 cited in Jabbour, 2013a: 2). The motivation for environmental management in the business context has been established in this chapter but the specific focus of this section is the importance of environmental training for workplace environmental management as part of the implementation context of an EMS, namely ISO 14001. Researchers consider environmental training, an emerging environmental field of study, and is credited to ISO 14001 for formalising its inception and progress in corporate environmental management (Unnikrishnan and Hedge, 2007). Other researchers also correlate effective environmental management positively with environmental training activities within ISO 14001 certified companies(Jabbour, 2013a). In support of ISO 14001 as a systems approach, incorporating environmental training, there is an integral synergy linking environmental performance enhancement through a formalised EMS system process utilising environmental training and top management commitment(Tung *et al.*, 2014).

Jabbour (2013b: 4) defines environmental training as "a systematic organisational process that gives employees the knowledge, attitudes, and skills to help organisations implement their

missions and visions." The goal of environmental training is to foster actionable skills that can further the company's environmental objectives and goals as set out in an EMS environmental policy for example. Training is also established as a means to mitigate identified organisational environmental risks. These risks are minimised when employees are trained with relevant knowledge and skills (Yu 2014). Mentis (2010:110) recommends that employees play a direct role in risk mitigation. This involves employee participation in the following ways:

- Identify relevant environmental risks
- Understand the nature of the risks
- Devising and planning of risk control measures
- Employees incentivised to implement risk controls

ISO 14001prescribes the undertaking of environmental training, and as established earlier in this chapter, incorporating relevant legislation and standards into the design of the EMS objectives and training material. Environmental training is also a legislative requirement which is undertaken as a reasonable measure for companies to integrate environmental management into business functions for the mandated protection of the environment. The international literature contribution to environmental training is emerging strongly, however the South African literature contribution to this topic is limited, even though there is significant impetus from a national policy level regarding environmental skills development in the workplace as a priority (Noe, 2001; DHET, 2011). However with South Africa having achieved globally comparable and significant ISO 14001 certification across several businesses, it follows that environmental training is a normative practice despite the paucity in local academic contribution to this topic(Lesourd and Schilizzi, 2001; World Bank, 2000). However, a singular environmental training study in South Africa conducted in 1997, found that environmental training is critical to successful environmental management practices in companies, albeit in limited implementation at the time in industry and business(Craffert and Fourie, 1997).

Several studies show that environmental training facilitates the transition to PES such as the ISO 14001 EMS, through increased organisational benefits of staff motivation, embracing cultural change and commitment to environmental programs(Perron *et al.*, 2006; Vidal-Salazar *et al.*, 2012; Jabbour, 2013a). PES is further supported by research that shows that there is a progression of environmental management in companies identifying three progression stages,

namely, reactive, preventative and to the ideal of proactive practices(Jabbour, 2013a). Additionally, Jabbour (2013) states that environmental training is an integral part of a PES and is a key indicator of company environmental maturity(Jabbour, 2013a).

There is a positive correlation between environmental training and achieving overall organisational goals, including increased levels of innovation accompanied by employee motivation for implementing environmental strategies(Zilahy, 2003). An earlier literature contribution focused on work-based learning, focusing on the workplace learning as an essential tool for adaptation to change through relevant deepening knowledge required for organisational effectiveness and performance(Raelin, 2000). Though provided in general terms, it shows that learning in the workplace is an established norm that has significant applicability to the emerging need for environmental training in the workplace.

3.6.1 Green HRM

Owing to the interdisciplinary characteristic of sustainability issues it is unsurprising that environmental skills needs are assimilated normatively through the application of the organisational discipline of Human Resources Management (HRM). HRM intersects with environmental management by skilfully appropriating a company's environmental goals and objectives towards training of the company employees while mediating the value and cultural changes inherent in this transition(Dodge, 1997).Therefore some authors have labelled this a Green HRM(Vidal-Salazar *et al.*, 2012; Jabbour, 2013a).Skills development and mediating organisational environmental transformation falls within the purview of HRM and integrating the environmental strategy into HRM functions in the area of training is supported in literature(Dodge, 1997; Jabbour, 2013a; Vidal-Salazar *et al.*, 2012). Furthermore, a HRM strategy that incorporates an environmental training strategy is further complemented by other organisational factors such as employee behavioural change that are a prerequisite for environmental performance. These behavioural attributes include employee commitment, cultural values and attitudes, and employee motivation which foster an effective transition to environmental integration (Vidal-Salazar *et al.*, 2012).

3.6.1. Organisational factors and outcomes linked to Environmental Training

Sustainability is seen as a transformative process that is inherently about change and change management(Blackburn, 2008).Bernstein(cited in Perron *et al.*, 2006: 553), for instance argues

that there is a strongconnection between change and employee participation, where, ‘‘Managing change is impossible without employee participation…. participation is impossible without understanding”. Environmental training therefore presents the opportunity to operationalise the voluntary compliance effort across a company by raising environmental awareness and skills of its workforces to effectually stay ahead of regulation requirements and reap the benefits of competitive advantage offered through environmental sustainability(Blackburn, 2008; Mammatt, 2012). However, what becomes critical is adapting the workforce to these changes, which present specific organisational challenges that are addressed within the environmental training practices (Perron *et al.*, 2006; Vidal-Salazar *et al.*, 2012). Knowledge management and organisational learning are also interdisciplinary organisational discourses that influence environmental training (Vidal-Salazar *et al.*, 2012).

3.6.1.1 Learning Organisation and Knowledge Management

Easterby-Smith and Lyles (2011), assert that organisational learning and knowledge management are subfields of organisational theory and these concepts lay a foundation for training practices in the workplace. Organisational learning refers to the study of learning processes within organisations, but its application is to create an ideal learning organisation as one that learns effectively and therefore results in a high performance levels. Knowledge management, on the other hand, refers to the creation of knowledge, its dissemination, storage and strategic advantage in creating an effective and adaptable learning organisation.Baird and Henderson (2001), explain that knowledge management in a learning organisation is either impeded or fostered, based on the learning culture of the organisation. Baird and Henderson (2001), further suggest that a performance culture is one based on teamwork and is the most knowledge-friendly culture to cultivate in the workplace. In support of this workplace culture, “Learning becomes a team and organisational process which requires new and innovative ways of learning and managing performance improvement” (Robbins *et al.*, 2009: 494).

3.6.1.2 Management Leadership

Management and board leadership is considered essential for environmental training and through a systematic approach to compliance and continual improvement, several authors concur that ISO 14001 remains a significant means to achieve this (Rondinelli and Vastag, 2000; Perron *et al.*, 2006). Nulkar (2014)uses the case of visionary leadership by Wal-Mart’s CEO, who demonstrated that good environmental performance is a result of constant

motivation and this kept employees focused on Wal-Mart's environmental goals and objectives, despite times of economic downturn. Nulkar (2014:136) further states that green strategies driven by ethical motives require the "stewardship of strong visionary leadership". Management values and attitudes are considered integral to driving the success of environmental management strategies (Papagiannakis and Lioukas, 2012; Tung *et al.*, 2014).As detailed in ISO 14001, Jabbour (2013b:152), comprehensively includes the following beneficiaries of environmental training within an organisation:

- Company Leadership from board members to managers
- Operational and administrative employees
- Subcontractors, and Suppliers

Management leadership attributes must entail personal values and attitudes that are complementary to and promote environmental management practices such as environmental training (Papagiannakis and Lioukas, 2012). Management leadership in environmental training also entails ensuring a sufficient amount of investment in human capital (with specialised skill), organisational infrastructure, technology and funding for the effective undertaking of training (ISO, 2004: 5). This investment is supported by Baird and Henderson (2001), who contend that management leadership has a vital role to play in change management which involves training activities that must be leadership motivated to embrace new cultural attitudes, values and knowledge.

3.6.1.3 Raising motivation of employees

Management leadership in environmental management is important, however bottom-up, employee buy-in is equally critical. Positive motivation leads to positive attitudes towards new processes and ways of thinking which allow employees to perform at their newly acquired skill level obtained through training (Lu, 2014). A motivated employee is likely to demonstrate greater commitment to the environmental measures otherwise easily ignored. Environmental training increases the motivation of employees by addressing their scepticism regarding new systems such an EMS, thereby creating an internal agreement to proceed with what might be regarded as additional and unpaid work in promoting environmental practices (Meima, 1997). In addition, one of the greatest challenges to change is a stifled and unmotivated corporate culture. Once the investigation into this culture begins, change itself becomes more evident (Foley, 2001). Hence, the key ingredient to adaptability is knowledge, and knowledge management is the process of managing information systematically with a strong emphasis on

collaboration, generating new knowledge and engaging with existing knowledge to meet strategic business goals (Gorelick *et al.*, 2004).

3.6.1.4 Cultural changes in performance enhancement

Several authors agree that environmental training initiates a change of culture towards environmental measures adopted through an EMS (Halme, 1997; Meima, 1997; Mohamed, 2001; Jabbour, 2013b). Importantly and similarly researchers agree that the culture of a company is seen as an important driver for employee performance (Halme, 1997; House *et al.*, 2004; Pohl, 2008). Environmental management is a sweeping change in corporate culture of business as usual and this takes deliberative measures to create a new culture regarding environmental performance. Organisational learning and creation of new knowledge is a means to change company culture and create a positive value system towards the new environmental goals of the company (Dodge, 1997). It is suggested the cultural change is slow and therefore employees should be part of the planning process of the environmental management changes as early as possible(Halme, 1997). The impact of training is influenced by the organisational culture receiving it and the impact of training can be impeded when a culture of learning and valuing the environmental goals is not simultaneously fostered(Lu *et al.*, 2014). The tools for developing an environmentally aware culture are elaborated by Halme (1997: 87), to include education and training, highlighting the following characteristic of cultural change facilitation:

- The environmental training should have clear links to work product or processes so as to be relevant and applicable and therefore create confidence and overcome employee scepticism.
- Resources and time must be committed by companies to allow for the additional and new roles of environmental performance to be integrated into traditional work streams. This includes providing adequate and skilled training sessions and also creating a positive reward system to acknowledge environmental performance.
- Environmental communication is imperative and this should be encouraged outside of formal training scenarios through the use of notice boards, regular reports or newsletters. Environmental communication is an essential element of holistic environmental training

In addition, Meima (1997), employing the Hawthorn Effect Theory which is an increase in employee performance without incentives, apart from positive special attention regarding a work task, concludes that attention to employees improves environmental performance. Meima (1997) elaborates that there is a latent ability that employees have in terms of commitment, capacity and interest in environmental management in the workplace and these can be effectively encouraged. Gherardi (2011), concurs that special attention through environmental training, gives employees ownership of the corporate environmental vision and enhances greater returns in terms of environmental performance. Hence, organisational culture effects organisational learning and positive emotions can be conducive to effective learning outcomes.

3.6.2 The Planning Process of Environmental Training

Failure to undertake training in organisations is directly related to increased organisational risk (Lu *et al.*, 2014). A failure model (Figure 3.2)indicates how inadequate training, organisational knowledge, skills and attitudes can negatively impact organisational performance (Lu *et al.*, 2014).However, the planning and implementation of training is defined in the ISO 14001 standard and this is given greater guidance through the ISO 10015 Training Guideline standard(ISO, 1999). This standard has been referenced and supported in environmental training literature and although it is a generic ISO training standard, it can be adapted for environmental training needs to add clarity to the process of training under ISO 14001(Teixeira *et al.*, 2012; Jabbour, 2013b).

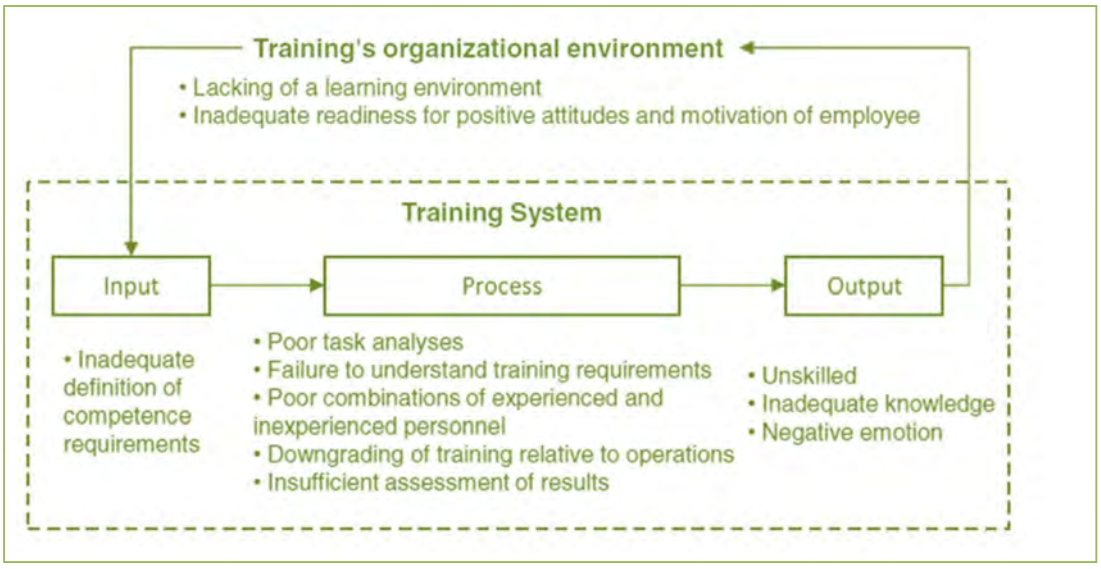


Figure 3.2: Organisational Training Failure Model from Lu (2014:315)

The ISO 10015 makes explicit the process of defining; designing and implementing; and evaluating environmental training in the workplace. This is shown in Figure 3.3and a summative explanation is as follows (ISO, 1999: 2):

- Defining the environmental training needs is established through a comparison of available staff competencies and required competencies that meet environmental goals and objectives as set out in the EMS. This is considered a needs analysis in ISO 10015. The purpose of the defining exercise is to establish the skills gaps between existing and required areas of competence which will inform the next phase of training design and planning.

- Training design and planning relates to decisions regarding roles and responsibilities of environmental training but also incorporates the skills needs into training provisions that consider:
    - Suitable training methods which can include courses and workshops, learnerships, on the job training and self-training.
    - Implementing training through the use of competent Training Providers that can include up skilling internal staff to be trainers or the use of external qualified trainers. These decisions are informed by skills needs analysis as well an understanding of the regulatory requirements for Training Providers.

- Evaluating the training undertaken is the final iterative phase of training provision in the ISO 10015 standard and entails both a short term and long term evaluation. The short term is related to employee feedback on the training received in term of relevance and satisfaction while the long-term evaluation is on the impact of the training on environmental performance targets.

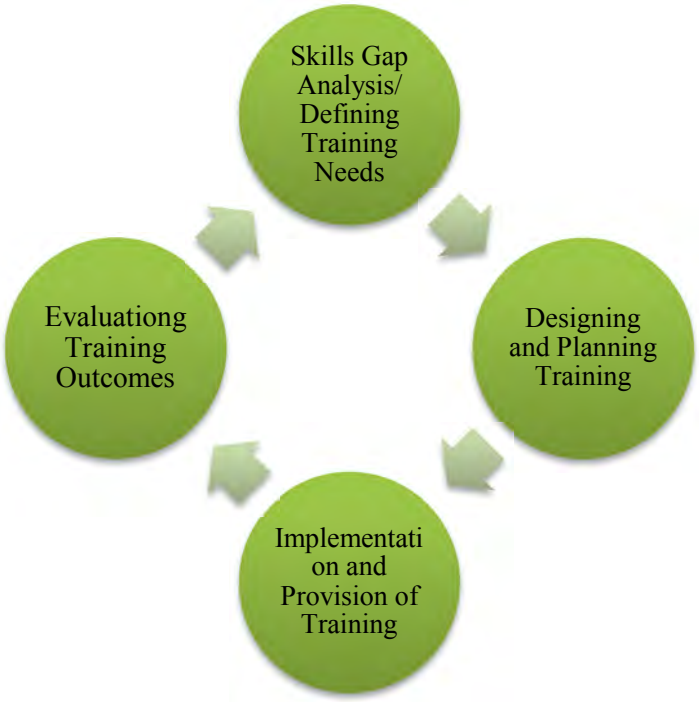


Figure 3.3: Typical Iterative Training Phases or Stages adapted from ISO 10015(1999:2)

3.6.3 Environmental Performance enhanced through Environmental Training

Environmental performance is based on a company's activities and how this creates a significant environmental impact for which specific measures are developed and presented in environmental training as mitigation or risk averse knowledge(Sammalisto and Brorson, 2008). However, researchers have made a positive correlation between environmental training and increased environmental performance (Jimenez and Lorente, 2001; Boiral and Henri, 2012). Notwithstanding the organisational benefits of environmental training, the following can be considered specific environmental performance outcomes of environmental training(Tung *et al.*, 2014: 190):

- Reductions in energy consumptions
- Reductions in water usage
- Reductions in material costs due to the efficient use of material
- Reductions in the levels of greenhouse gas emissions
- Reductions in other air emissions
- Reductions in levels of waste
- Reductions in the costs of regulatory compliance
- Reductions in the time taken to respond to environmental incidents and minimizing their impact

- Reductions in the costs associated with cleaning up environmental damage
- Reductions in the fines paid and remediation costs regarding environmental damage
- More effective and efficient decision making regarding environmental issues
- Producing goods in a more environmentally conscious manner

Reducing environmental impacts is a key indicator of environmental performance, and innovation is an anticipated outcome of PES such as ISO 14001(Zilahy, 2003; Bernardo, 2014). Innovations that create and seize opportunities for energy efficiency is a global trend, especially in the area of industrial clean production technologies (Zilahy, 2003). Concomitantly, these fields of innovation are expanding in South Africa, for example the National Cleaner Production Centre (NCPC). NCPC is a Department of Trade and Industry led industrial energy efficiency and resource efficiency program. This program offers private industry the opportunity to secure subsidised relevant energy efficiency training and the adoption of an Energy Management System incorporating cleaner production technologies that can save companies money through lowered energy costs and benefits the environment through reduced GHG emissions (NCPC, 2015). The Durban-based success of this program is the King Shaka International Airport which undertook the energy efficiency training for its staff and implemented the Energy Management System with cost-effective technology changes that reduced energy usage significantly which led to over R 2 million in billable cost savings (NCPC, 2015).

3.7 CONCLUSION

Environmental training has been explored through the lens of ethical, institutional and legal contexts. The ethical basis for environmental law was examined expounding on the anthropocentric traditions of environmental ethics that influence environmental law. This has relevance to how the duties towards the environment are constructed in the Constitution and in the NEMA. The legal application to environmental training is the duty of care principle and the legal obligation for organisations to take reasonable measures to protect the environment and human well-being. The NEMA prescribes these reasonable measures to include education and training to reduce environmental impact.

The principles of sustainable development enshrined in the legislation is further promoted by the New Growth Path transition to a green economy that government has endorsed as its

economic strategy for the medium term, and this has specific environmental skills demand implications for business employers and employees. This formed another dimension of motivation as to the importance of environmental training that is strongly driven from a national policy context through the Environmental Sector Skills Plans, SETAs and National Skills Development Strategy III among other policy initiatives.

Intersecting these institutional and legal drivers for environmental training, the corporate response to the pressures to adapt to sustainable business practices is examined in view of changing business ethics influenced by environmental ethics as well as within broader industry specific sustainability practices. Aligned to this changing business value system of environmental best practice, particular focus, is the organisational level of implementation of environmental training which is discussed in detail examining the organisational factors for environmental training and the ISO 14001 system of implementation complemented by the ISO 10015 standard for environmental training. The discussion looked at the organisational factors such as values, culture and management leadership, and knowledge management for effective environmental performance in companies.

CHAPTER FOUR: BACKGROUND AND METHODOLOGY

4.1 INTRODUCTION

This chapter presents the background to the research area and the methodology employed in this research into the environmental training practices of selected businesses in Durban. The background presents the socio-economic and environmental context of the research study area of Durban by expounding on its economic activity and environmental sustainability priorities within the eThekwini Municipality. The environmental sustainability agenda of Durban is keenly focused on climate change adaptability and development within a Green Economy framework. Business activities are elaborated on delineating the economic sector activities showing Durban as a relevant locale for the purposes of this research aim.

The remainder of the chapter focuses on the methodology employed in researching the environmental training practices of Durban. The methodology focuses on the how the aim and objectives of this study are accomplished through mixed-method phenomenological approach.

4.2 BACKGROUND TO THE STUDY

Durban is located on the east coast of the KwaZulu –Natal Province in the eThekwini Municipality. It is the largest city within the Province and third largest in South Africa with a population of over three million people (eThekwini-Municipality, 2011a). Sutherland *et al.* (2013: 4), confirm the re-demarcation of the Durban municipal boundaries was enlarged by 68% in the year 2000 to include the adjoining, but previously apartheid-segregated hinterlands. The new municipal boundaries have since been administered by the renamed eThekwini Municipality (isiZulu translation for Durban), which is spatially the same as the commonly referred name of Durban (Sutherland *et al.*, 2013). Therefore the eThekwini Municipality, commonly known as Durban, necessitates the interchangeable use of these names. The study area is represented in Figured 4.1 also showing the distribution of the 24 selected Durban businesses representing ISO 14001 certified business respondents used in this study.

The economic landscape of Durban is dominated by its Port activities, with Durban's Port being the largest in the Southern hemisphere, and is a major gateway for the 61% of national import and export activities (Foulds, 2015: 35). The eThekwini contributes two-thirds of the Provincial GDP with the economic activities of Durban being the municipal economic engine

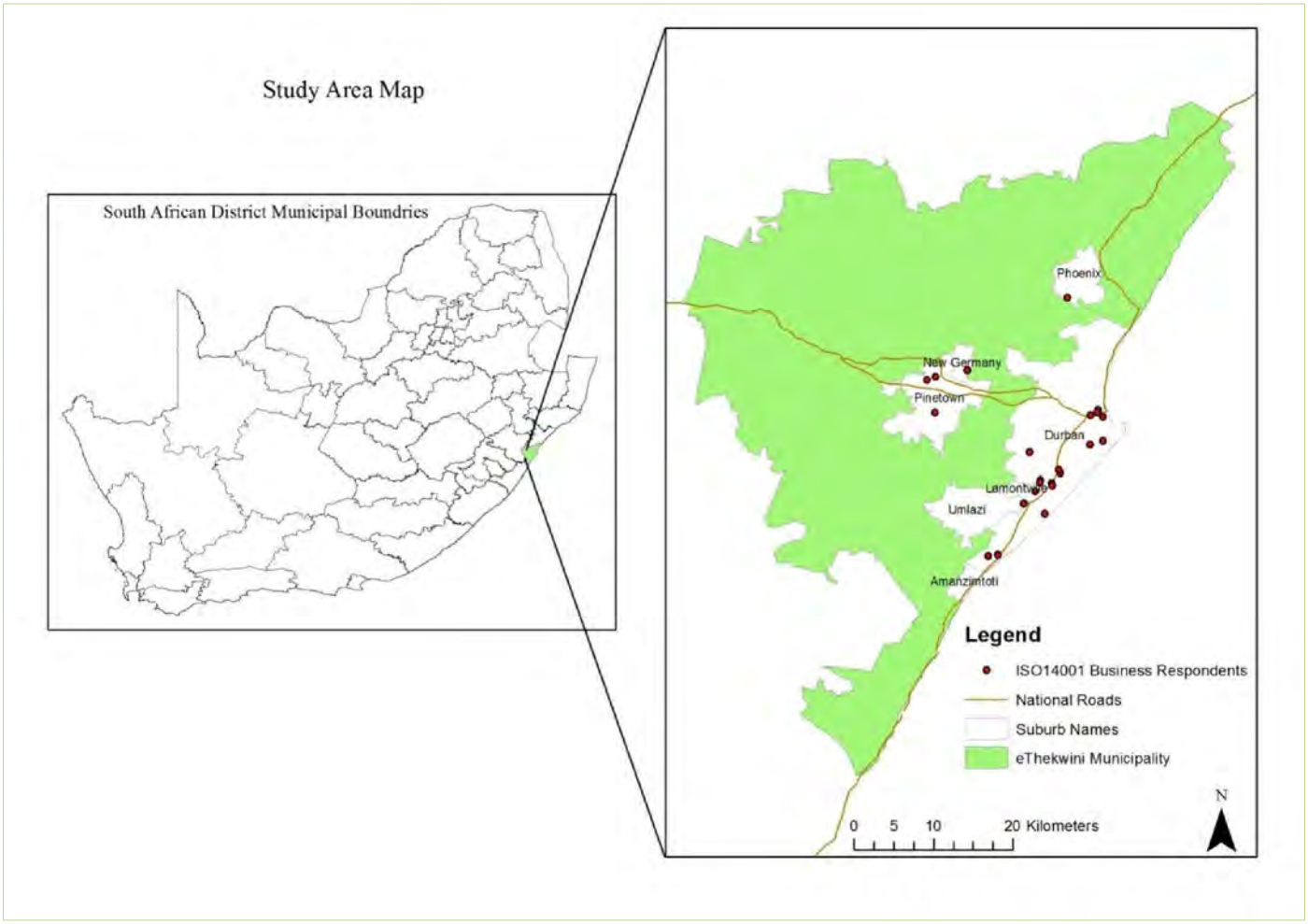


Figure 4.1: Research Area Map showing distribution of research participants in Durban (*UKZN GIS*)

contributing 75% of the Municipal GDP(eThekwini Municipality, 2006a: 6).The national State of the Environment Outlook report has presented that the, "the economy has undergone a transition from a primary economy based on resource extraction to a tertiary one focused on manufacturing and financial services"(DEA, 2006: 22). The eThekwini economic sector represents this shift whereby the municipal economic sector stratification highlights the predominance of the finance, manufacturing and trade and transport sectors as key contributors to the eThekwini GDP with manufacturing representing 22 % of the municipal GDP(Figure 4.2)(eThekwini Municiplality, 2014: 30).

With the potential for the manufacturing sector to contribute to significant environmental impacts, it would presumably be this sector that employee-focused environmental training should be directed. The employment distribution, presented in Table 4.1, in the manufacturing sector show high employee numbers in the Durban localities of Jacobs, Maydon Wharf and Pinetown within Durban (eThekwini Municipality, 2006a: 22).

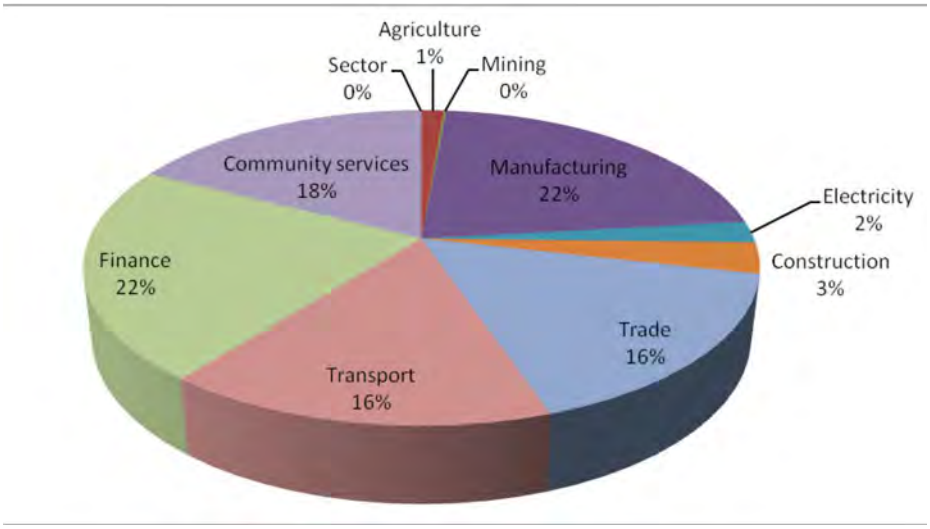


Figure 4.2: The economic sector GDP contribution of the eThekwini (eThekwini Municipality, 2014: 30)

Table 4.1: Manufacturing sector employment and nodal distribution in Durban adapted from the eThekwini Economic Development Review (eThekwini Municipality, 2006:22)

Manufacturing Node	Approximate Employment Numbers	Industry Description
Jacobs / Mobeni	73400	Mature industrial (Chemicals, Plastics, Confectionery, Textiles, Footwear, Packaging, Engineering)
Port of Durban / Maydon Wharf Tourism, Freight	35000	Logistics and Transport Manufacturing, Engineering, Recreation
Pinetown / New Germany	52200	Mature industrial (Textiles, Earthmoving, Beverages, Footwear Components, Electronics, Medical Goods)

4.2.1 Durban's environmental priorities and business community responsiveness

Durban is a naturally well endowed city having 98km of coastline, 4000km of river systems and being identified as a biodiversity hotspot as part of the Maputaland-Pondoland-Albany Region(eThekwini Municiplality, 2014: 38). The eThekwini Municipality has stated its alignment to the national New Development Plan for a Green Economy in the 2014 Integrated Development Plan (IDP) and is promoting sustainable development through its climate change and energy efficiency focus. Durban has also hosted the COP17/CMP7 in 2011 and this has put greater pressure on Durban to proactively engage with the broader issues of environmental sustainability (eThekwini Municipality, 2011b; Sibusiso, 2011). In view of this, specific

environmental areas of address are consistently elaborated on in municipal policy statements which invariably involve the business community. This mainly relates to Durban's Climate Change strategy which focuses on adaptive measures to address climate change but also strategies through the Energy Efficiency program. The eThekwini supports the National Department of Trade and Industry's program, named the Private Sector Energy Efficiency Project(PSEEP), which provides support to companies towards achieving the following (eThekwini Municipality, 2015):

• Increased awareness of energy efficiency
• Energy savings
• Energy intensity reductions
• Operational reliability
• Reduction of Greenhouse Gas emissions
• Improved economic competitiveness through resource and process efficiency
• Investment leveraged from private and public sectors through capital investment in energy efficiency projects
• Indirect social benefits such as job creation/job retention and skills development relating to energy efficiency services

4.2.1.1 Climate Change

In terms of climate change, Durban has developed a Climate Change Strategy that was finalised in September 2014 addressing predominantly adaptive strategies to climate change (eThekwini Municipality, 2014). The strategy outlines that Durban business activities through the transportation and industry sectors contribute37% and 24% to Greenhouse Gas (GHG) emissions respectively, making it the largest contributors to GHGs in the municipality(eThekwini Municipality, 2014: 54). The strategy further has highlighted the economic development opportunities in renewable energies that can reduce GHG emissions in view of the strategic objectives for Durban's economic sector which is to "develop a low carbon economy that is socially responsible and environmentally sustainable"(eThekwini Municipality, 2014: 29). Importantly, one of the key strategies for climate change adaptation is creating an environmentally educated and informed Durban citizenry including businesses as stated in the Durban Climate Change Strategy document, "educate business, civil society and residents about the impacts that climate change will have on their businesses and communities, and that they are equipped with the tools and knowledge to respond optimally to these

impacts"(eThekwini Municipality, 2014: 32). The Durban Chamber of Commerce and Industry (DCCI) which represents over 3500 businesses in Durban, has through its Environmental Forum presented the Climate Change Strategy to the Durban business community and represents a singular example of the effort to disseminate this information to businesses(DCCI, 2014).

4.2.1.2 Air Quality

Air quality is also a particular area of environmental impact focus in Durban in particular on industrial activities and air quality impacts on environmental health within the city limits. The well documented history of environmental injustices in the South Durban Industrial Basin, by several authors, relate to air polluting industry located within residential communities, and remains a strong reminder of the need to change to clean technologies and to replace dirty fuels in industry(Matooane and Diab, 2001; Diab *et al.*, 2002; Brooks *et al.*, 2010). With the effective NGO stakeholder impact of the South Durban Environmental Alliance (SDCEA), the Multi-Point Plan for the South Durban Industrial Basin which together with cooperation from various local Industrial businesses, continue to address air pollution control through the government-led Air Pollution Management System(DEAT, 2007). The system is aimed at reducing pollutant and harmful chemicals such as Sulphur dioxide, Nitrogen dioxide and Volatile Organic Compounds (VOCs) by enhancing monitoring and enforcement. The South Durban industrial zone remains a highly contested terrain amidst persistent calls for social and environmental justice along with improved and transparent environmental management by local industrial businesses (Vidal, 2011).

4.2.1.3 Business Community Responsiveness

The priorities of environmental protection in Durban often intersect with industry and business responsibility to co-operate and comply with legal and strategy commitments of the city in climate change, air quality , energy efficiency and also in waste management (eThekwini Municipality, 2009). Training and awareness of these various and complex dimensions of city-wide environmental protection priorities become increasingly more important as highlighted. Business Associations such as the DCCI Environmental Forum and the voluntary coalition of business through the National Business Initiative (NBI) represent information dissemination and awareness raising channels regarding environmental sustainability issues that require business cooperation and action(DCCI, 2014; NBI, 2015). An example is the NBI Program on

Climate, Water and Green Economy as well as the Climate Change, Advocacy and Information Sharing Program(NBI, 2015). These efforts present business interests but also provide an avenue of influence and an avenue for an environmental ethic to become more pervasive in business and corporate responsiveness.

4.3METHODOLOGY

Leedy and Ormrod (2005: 9) define research as "a systematic process of collecting, analysing and interpreting information (data) in order to increase our understanding of the phenomenon about which we are interested or concerned".The aim of this research is to review the environmental training and awareness practices within selected Durban businesses. The following objectives make explicit the direction of this inquiry as follows:

1. To investigate the extent of environmental training and awareness (ETA) within Durban businesses in particular those that are ISO 14001 certified.
2. Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.
3. The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation
4. Develop a set of ETA principles to evaluate the ETA practices

The research falls within the ambit of a qualitative and inductive approach because it is an exploratory research into environmental training practices. Qualitative research is conducive to topics that are multidimensional and layered with the specific aim of portraying the issue under study in its multifaceted form (Leedy and Ormrod, 2005).An inductive method is further suitable for qualitative research as it allows for the emergence of a grounded theory which can explain a phenomenon (Strauss and Corbin, 1998; Patton, 2002).The research represents a qualitative approach within the Phenomological research tradition. Phenomological research is exploratory and seeks to understand complex social experiences from different perspectives with the aim of reaching a consensus in understanding of that phenomenon (Tesch, 1994).

Although this study is pursued in the qualitative approach, a quantitative method of data collection through a survey method is used which is complemented by a qualitative sampling and analysis strategy. Quantitative and qualitative forms of research are both synergistic allies in allowing an explanation to emerge from data. This research which represents a mixed

method strategy is explained further by Layder (2013:12) "Qualitative analyses directly complement quantitative studies by providing data on the dynamics of encounters and lived experiences that quantitative information cannot directly supply. In other cases, qualitative studies explore areas about which little is known and which may then be enhanced by quantitative data and evidence." In support of mixed method studies that employ a qualitative approach, "The operational point is that data collection and analysis can be done in both modes and in various combinations, during all phases of the research process"(Strauss and Corbin, 1998).

4.3.1 Sampling

Durban has a large business sector comprising an estimated 2796 member businesses registered on the Durban Chamber of Commerce and Industry (DCCI, 2013). In this phenomenological and qualitative study, non-quantitative sampling techniques have been utilised. Specifically non-probability sampling has been conducted using the purposive and convenience sampling strategy. This sampling method is supported for qualitative research where the determination of sample size is rife with ambiguity (Patton, 2002). Furthermore, Patton (2002:244) asserts that are "no rules for sample size in qualitative inquiry" but sample size determination should meet the following requirements of the research:

- What do you want to know
- What will be useful
- What will have credibility
- What can be done with available time and resources

The determination of the population size of ISO 14001 certified businesses in Durban proved elusive however a sample size of fifty (50) businesses was determined. This sample size would support a valid, information-rich and meaningful collection of data (Patton, 2002). As part of the purposive sampling, the identifying criterion for selecting relevant businesses in Durban is ISO 14001 business certification. This criterion directs the use of purposive sampling, which has been chosen as it will enable the research to be focused on companies that have an invested interest in this specialised topic of environmental training, which is anticipated to yield the most information for the topic being investigated. The use of qualitative purposive and non-probability sampling combined with the use of a quantitative survey data gathering tool is supported when the population size is not determinable (Layder, 2013). Layder (2013:102) argues further that the strategic purpose of this combination is justified if there is an "emphasis

on exploratory as well as explanatory aims" whereby "flexibility of data collection and analysis is necessary."

The businesses were identified though online searches and the use of available information on the South African Bureau of Standards (SABS) website. The SABS website offered limited access to ISO certified company information as the website was not designed to include certification as a search criterion. However, snowball sampling was therefore used to locate further research participants in addition to the 50 ISO-certified businesses to include the following:

- Safety, Health, and Environment Training Providers
- The Small Enterprise Development Agency(SEDA)
- Durban Chamber of Commerce & Industry, Environmental Forum(DCCI)
- An NGO - South Durban Environmental Alliance(SDCEA)

These additional participants are purposively chosen to give a holistic perspective on this inquiry into environmental training. Based on these considerations and that the exact population of ISO 14001 businesses are not centrally available information, a sample size of fifty (50) businesses will strengthen the validity of the ISO-certified business research findings. Importantly, the purpose of this qualitative sampling method is to give credibility and not representativeness in exploring the environmental training activities within Durban businesses. In lending credence to this, Newman and Benz (1998) argue that without compromising the validity and reliability of qualitative research, generalisations of a population are not necessary results of this approach. It is acknowledged that the results of this research are limited to the selected sample of this study of Durban businesses.

4.3.2 Data Collection

Data is the evidence of research and from which findings and analysis are based (Patton, 2002; Richards, 2009). The data collection involved both primary and secondary data sources. In a mixed method inquiry, primary data brings a researcher closest to truth-revealing facts while secondary data provides essential context useful for analysis and deeper understanding of the problem at hand (Patton, 2002; Leedy and Ormrod, 2005). There were several primary data sources utilised and these are listed in Table 4.2.

Table 4.2: Research Respondents

Identified Participants	Respondents
Fifty (50) ISO 14001 certified business	Managers involved in Environmental Management or a related role.
Durban Chamber of Commerce & Industry: Environmental Forum	A Representative of the Environmental Forum
SEDA.	A Representative of the organisation
Employees of various companies undergoing environmental training	Employees undergoing training at a environmental training event where identified
Environmental Training Professionals	Two (2) Training Service Providers were identified
NGO: South Durban Community Environmental Alliance.	A representative of the organisation

Secondary data sources were used to provide important information that contextualised environmental training and helped to meet the objective of developing environmental training principles that can be used to analyse the findings of this research. The sources of secondary data included numerous documentation sources as follows:

- Journal articles
- Multimedia Newspaper articles
- Books
- Online databases and relevant websites
- Legislation and Policy Documents
- ISO Standards

4.3.2.1 Research Instrument

The questionnaire survey method employed in this study is a self-administered questionnaire submitted to participants through email. Contact was first established through telephonic introductions before the respondents were provided with the research information on email. The survey method is considered a valid and cost-saving method for data collection and presents timely results for this sample size across the locality of the research area (Groves *et al.*, 2009). Groves (2009) lends further support to the use of survey questionnaires, when the nature of the questions is largely administrative requiring limited direct interaction. Leedy and Ormrod (2005), explain that the remoteness of the participant from the researcher is an advantage as anonymity encourages more truthful responses. While on the other hand, the disadvantages of the survey method of data collection are typically a low response or return

rate and higher likelihood non-responsiveness to unit questions. Six different but similarly themed questionnaires were designed and submitted for completion to the respective respondents as shown in Table 4.2. The research instrument used is a concise questionnaire comprising of open and closed-ended questions. The use of the six differently but similarly themed questionnaires, make use of checklists, rating scales, closed and open-ended type questions. Each questionnaire has been carefully constructed to elucidate maximum information from participants, while remaining clear and easy to follow. The use of checklists and rating scales such as the Likert scales illicit appropriate responses on questions of behaviours, attitudes, opinions and perceptions(Leedy and Ormrod, 2005). An email, appointed meetings and telephonic follow-up with participants was regularly necessary to ensure a complete and valid questionnaire response. The questionnaires were sent to each participant through email as an attachment, and completed questionnaires were either faxed or return emailed.

4.3.3.2 Triangulation

The triangulation technique was employed in this study by sourcing primary data from Durban business and other stakeholders and role-players that are pertinent to the research topic of environmental training in Durban as shown in Table 4.2.The triangulation technique promotes the use of multiple data sources in search of common themes in order to validate and support the emergent patterns of this study. Triangulation data gathering strategy is useful in qualitative studies and enables coherent view of the topic from various perspectives (Leedy and Ormrod, 2005). Patton (2002: 247) lends further support contending that, "Triangulation strengthens a study by combining methods. This can mean using both quantitative and qualitative approaches". Furthermore, the technique of triangulation is a commonly employed in research with the aim of "bringing many perspectives to bear on the question" (Richards, 2009: 20).

4.3.4 Data analysis

Data analysis is the "process of bringing order to data, organising what is there into patterns, categories, and basic descriptive units" (Patton, 2002: 144).In the endeavour to uncover the phenomenon of environmental training in Durban the coding process of the data is undertaken to reveal specific phenomena revealed through the analysis of the questionnaire responses. This is consistent with the ideas presented by Strauss and Corbin (1998: 130), "In coding, categories stand for phenomena." In addition to assessing the results in terms of the original objectives,

the development environmental training principles will be used to qualitatively evaluate the results of the study.

The survey data gathered is firstly described through the use of coding which organises the data into 'meaningful patterns or segments and makes them practically manageable"(Layder, 2013: 139). These descriptions are generally void of specific interpretations or judgements but aim to give a picture or context of the sample respondents(Patton, 2002). Therefore the profile of the respondents is presented accordingly detailing demographics and other analytically useful information. Coding is useful to the extent that it leads to discovery that responds meaningfully to the initial research aim and objectives (Strauss and Corbin, 1998; Richards, 2009). To this end, the coded data is presented and analysed further in themes. As Richards (2009) points out that the description of the coded data is insufficient without the analysis. Therefore thematic categories of responses are presented and analysed which shows the emergence of dominant topics or themes from the questionnaire responses. The discussion of the themes and categories are aided by the use of the developed environmental training principles. Supporting this process, Richards (2009:138) comments, "With the qualitative research method, the data once codified and described sufficiently, should allow for the emergence of a 'localised', 'substantive theory' or explanation".

4.3.5 Research Ethics

This research has been conducted within ethical limits characterised by informed consent of research participants and a guarantee of participant information anonymity. These norms of ethical practice in research are promoted to "govern the conduct of researchers and are instrumental in safeguarding the well-being of research subjects" (Layder, 2013: 17). The nature of this research in environmental training is not considered sensitive however; every effort has been made to approach this research ethically, within the approved ethical consent of the University of KwaZulu-Natal. Anonymity of the business participants and their representative companies has been prioritised.

Each participant has been provided with a detailed information sheet with the emailed questionnaire which outlined the aim of this study and has presented a clear statement of the voluntarism of their participation and protection of their anonymity. For further assurance, a feedback option was presented if any participant wished to be privy to the final thesis report.

Anonymity of research participant details was also offered through the omission of actual company or participant names in the final thesis and that all questionnaires will be duly disposed at the end of the research period. Furthermore, each participant was given an opportunity to consent based on the information provided.

4.3.6 Limitations

The survey method is advantageous in meeting the time and cost restrictions of this study however, presented limitations in terms of securing participation from business respondents. The very busy schedule of respondent managers combined with the voluntarism of their time for an emailed questionnaire request, proved difficult to manage. Further, the lack of a cooperative and research-aware business culture was evident and presented a significant barrier to this inquiry. However, this was overcome with persistence but required flexibility in adjusting the time-frame of this research and seeking additional participants. Additional flexibility was required in terms of the initial research design which required two employees (management level) from each ISO 14001 certified company to complete the questionnaire to a single management level employee from each company. This has been compensated by participation from other selected role-players that inform this study relevantly and together present a holistic perspective of the environmental training activities in Durban.

4.4 CONCLUSION

The research methodology employed is a mixed methods approach for a phenomenological exploration into the training practices of the selected Durban businesses. The quantitative data collection instrument is an emailed survey questionnaire distributed to purposive and non-probabilistic determined sample of participants. Qualitative data analysis through coding and thematic analytical methods will be used to provide a response to the original aim and objectives of this research.

CHAPTER FIVE: DATA ANALYSIS AND DISCUSSION

5.1 INTRODUCTION

This chapter includes the presentation, analysis and discussion of the research findings. The findings of the research inquiry was conducted through the use of self-administered questionnaires that have been submitted through email to identified ISO 14001 certified business participants (referred to hereafter as business respondents) and to other relevant stakeholders and role-players (referred to hereafter as other respondents).The demographic profile of the business respondents are firstly described followed by the demographic profile of the other respondents. The use of bar-graphs and pie charts illustrate the profile findings. The analysis and discussion follow which will thematically classify and discuss the survey responses to address the research objectives.

5.2 PROFILE OF BUSINESS RESPONDENTS

Fifty ISO 14001 certified businesses were identified and contacted of which twenty-four (24) completed questionnaires were returned. The twenty-four business responses (hereafter descriptively shown as n=24), represents a 48% response rate. The profile of the business respondents is shown in Table 5.1. The most frequent responses are highlighted showing that most of the respondents are aged between 30 to 39 years, with 1-5 years of work experience in their current place of employment and have a degree level of education.

Furthermore, the business respondents consisted of management or supervisory level staff with designated environmental competencies in the company they represent. The businesses are represented by the following business activity types as shown in Figure 5.1.Manufacturing activities are the dominant business type of the surveyed participants representing 50% of total business activities surveyed. Business services, petrochemical and industrial services account collectively for 38% of the business types. Business services are non-industrial business activities while Industrial services are non-manufacturing activities that offer specialised industrial services to the heavy and light manufacturing industries. The agricultural and transportation industries represent 4% and 8% respectively of respondents' business activities.

Table 5.1: Business respondent's profile

Business Respondents	Frequency (n=24)
Age	
25 to 29	4
30 -39	8
40-49	6
Over 50	4
Undisclosed	2
Total	24
Work Experience at Current Employment (Years)	
<1	2
1 -5	10
6 – 12	7
13 -20	2
20-30	2
Total	24
Education Level	
High School	4
Diploma	2
Degree	8
Honours	3
Masters	5
Total	24

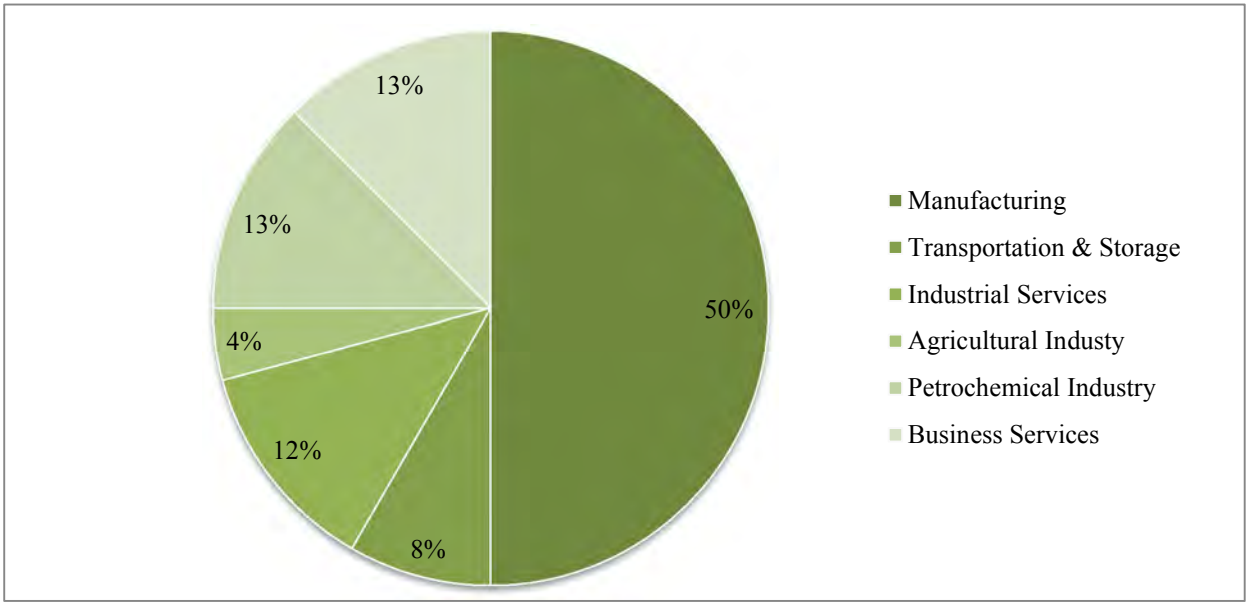


Figure 5.1: Types of business activities represented by respondents (n=24)

5.2. 1 Geographic distribution

The geographic distribution of the business respondents show 70% are located within the south of Durban in the areas of the Bluff, Jacobs, Mobeni, Merebank, Prospecton, and Umbogintwini. The South Durban area is synonymously the industrial heartland of Durban and these findings are consistent with this reality. Additionally, the Pinetown area, west of Durban; Phoenix, North of Durban; and Durban Central are represented geographically by 17 %, 8% and 4% of business respondent locations, respectively.

5.2.2 Number of Employees

Each business respondent was requested to provide an indication of the number of staff employed at their place of business. The collated categories and percentage distribution is shown in Figure 5.2. The highest category employment numbers were between 30 to 100 employees representing 38 % of the respondent businesses surveyed. This is closely followed by 33% of companies showing employment numbers of 100 to 250 employees. According to the National Small Business Act, 1996 as amended, a small business is defined as having up to 50 employees, and a medium enterprise from 51 to 200(RSA, 1996.-b). The question of nationwide-employee figures did exceed the ambit of this survey, however, based on the employment figures provided, the majority of the businesses in this survey can be relevantly considered as a Small to Medium Enterprises (SME). The remainder of the survey showed 13% of businesses have 250 to 500 employees and 8% have over 500 employees. However, there were 8% of respondents that did not divulge their company employee figures.

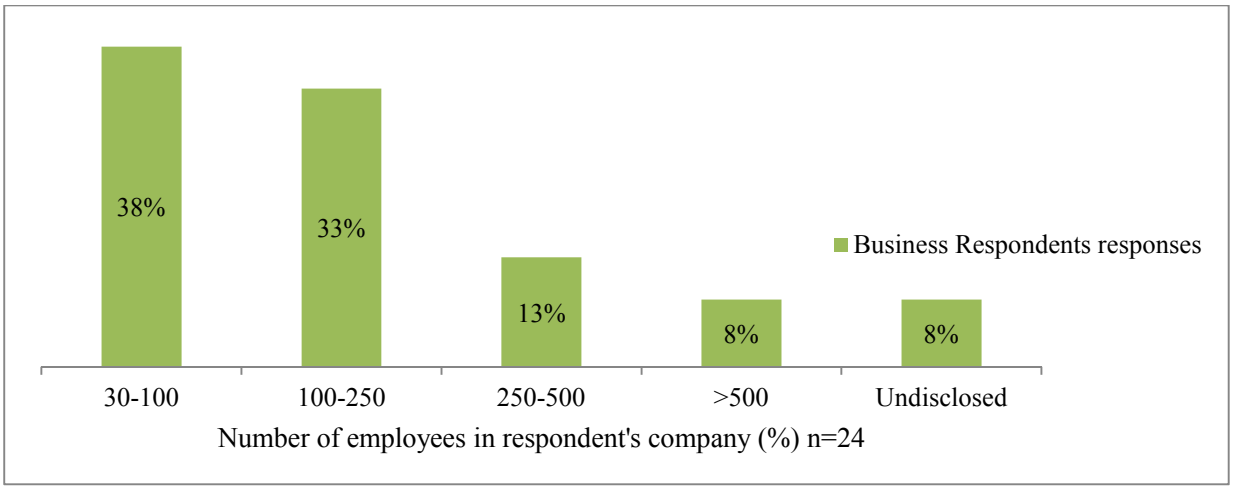


Figure 5.2: Number of employed staff at business respondents' companies

5.2.3 Business Respondents: Occupational designation and titles

The employment status of each respondent was queried to ascertain their occupational designation and how this may in turn relate to environmental competencies. The survey questionnaire was purposively required to be completed by management or leadership level competency for environmental management in each company. Therefore in the submitted survey questionnaire the occupational titles of each respondent show that there is a predominance of the Safety, Health and Environmental Manager (SHE) and Safety, Health, Environment and Quality (SHEQ) Manager designations. As shown in Figure 5.3, the occupational titles are represented by 46% for SHEQ Manager and 12% for SHE Manager. The linking of Safety and Health with Environmental management is commonly practiced as it is considered a way of streamlining disparate management systems and resources.Prakash and Potoski (2006), concurs this is a common occurrence with ISO 14001 and ISO Quality Management Systems such as ISO 9001. However, environmental competencies are also represented independently by 17% of business respondents as Sustainability and/ or Risk Managers. Environmental management competency and leadership is also represented by Operational Managers and Engineers; as well as Facilities Managers shown as 12% and 13% respectively. These latter designations intimate that environmental management is relegated to staff competencies that interface with company-specific environmental impacts and therefore are best positioned to address it.

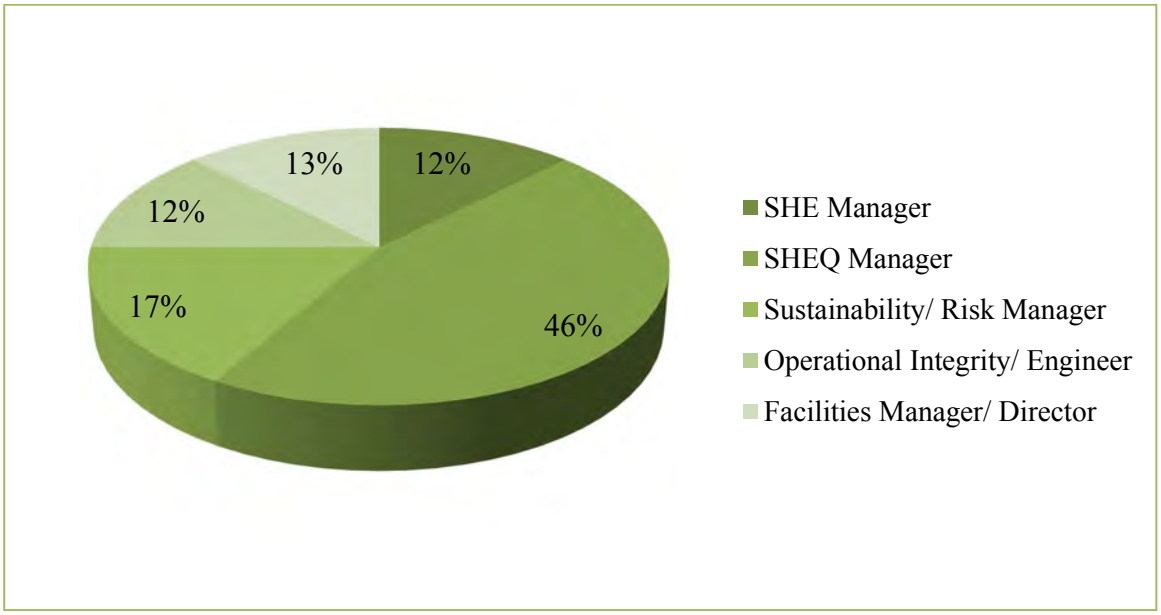


Figure 5.3: Occupational titles of business respondents (n=24)

5.3 OTHER RESPONDENT PROFILES

Environmental management in the business arena is motivated strongly by pressures external to it. This is characterised by NGO environmental justice groups such as the South Durban Industrial Alliance (SDCEA). Business interests are often also presented through business sustainability alliances and groupings such as through the DCCI Environmental Forum. The intersection of SME businesses and environmental stewardship is a growing body of interest and these pressures impact businesses adoption of environmental stewardship. The publicly-appointed organisation of the Small Enterprise Development Agency (SEDA) finds relevance in this topic accordingly. Two Training Providers that conduct environmental training have also participated and give practical insight into this activity. These respondents therefore will be considered hereafter descriptively as n= 5. Also presented here and tangential to these perspectives is the pragmatic application of environmental training which is represented by the fifteen (15) environmental trainees that participated in the survey (hereafter descriptively known as n=15).The summary the respondent profiles of the following participants follow:

- 15 Employees undergoing environmental training
- 2 Environmental Training Professionals
- SDCEA Representative
- DCCI, Environmental Forum, Representative
- SEDA, Representative

The employees from different companies in Durban that underwent an environmental awareness training course with a leading environmental training provider was approached for completing the survey questionnaire during a pre-arranged training event. The employees were neither vetted for representing ISO 14001 companies nor their relevance in a professional capacity. However it was required at the time of the survey that the trainees were employed by a company and were undergoing environmental training. In this sense it was a random and convenient selection of employees with the aim of gaining an insight of employees' perspectives on environmental training in the workplace. Sixteen employees completed the questionnaires, with fifteen (15) valid responses representing a 94% response rate. One respondent was not in current employment and therefore the questionnaire was considered invalid and excluded.

Table 5.2: Environmental trainees and other respondent profiles

Respondent Profile	Environmental Trainees Frequency(n=15)	Other Respondents Frequency (n=5)
Age		
25 to 29	8	-
30 -39	2	2
40-49	4	-
Over 50	-	2
Undisclosed	1	1
Total	15	5
Work Experience at Current Employment (Years)		
<1	-	1
1 -5	13	1
6 – 12	2	3
Total	15	5
Education Level		
High School	10	1
Diploma	4	2
Degree	-	-
Honours	-	1
Masters	1	1
Total	15	5

Table 5.2 shows the collated profile of the environmental trainees and other respondents. The highest frequency responses are highlighted showing that the environmental trainees are predominantly aged between 25 to 29 years, mostly with 1 to 5 years work experience in current employment and having a High School level of education. The other respondents are between 30 and 50 years of age, showing diploma and degree qualification predominantly and have between 6 to 12 years of work experience.

5.3.1 Environmental Trainees: Business Types

In Figure 5.4 the company activities of the employed environmental trainees show that 50% are in business services and industrial services. Transportation and Storage business activities are common for 20% of the sample group. Manufacturing business activities are less frequent at 13% with agricultural and the gaming industry representing the least frequent business

activities of this sample group at 6% and 7% respectively. However, 6 % of the respondents did not divulge the business type information of their companies.

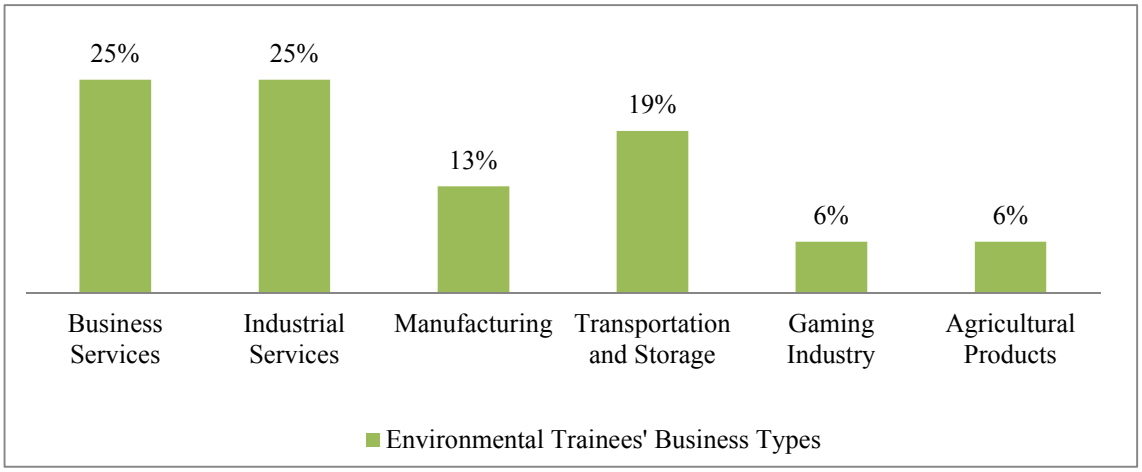


Figure 5.4: Types of business activities represented by environmental trainee respondents (n=15)

5.3.2 Environmental Trainees: Number of Employees in businesses represented

The environmental trainees presented their respective company employment figures as shown in Figure 5.5. This shows that 40% of companies employ between 30 to 100 employees. Equally frequent are 40% of companies employing between 100 to 250 employees. These employment figures strongly indicate that the environmental trainee respondents are predominantly employed in SME businesses. Between 250 to 500 employees are confirmed by 13% of environmental trainees.

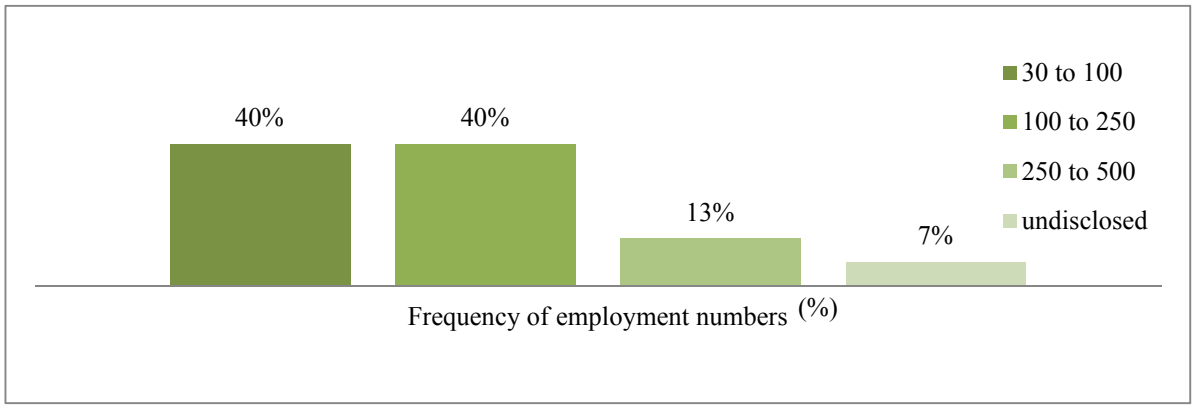


Figure 5.5: Number of employees in environmental trainees' companies (n=15)

The environmental trainees have not been purposively sampled on the basis of their respective companies ISO 14001 certification status, however, they were requested in the questionnaire to respond to the certification status of their employing companies as this would allow for meaningful cross-correlation of data received from this group of respondents. The majority (60%) of the respondents are from ISO 14001 certified businesses as shown in Table 5.3.

Table 5.3: ISO 14001 Business Certification status of environmental trainee respondent's respective employers (n=15)

Is your company ISO 14001 certified	**YES**	**NO**	**UNSURE**	Total
	60 %	20%	20%	100

5.3.3 Occupational Designations of Environmental Trainee Respondents

As shown in Figure 5.6, occupational titles of the environmental trainees show that 47% are administrative SHEQ related roles such as SHEQ officer, SHEQ representative and Safety officers. The next most frequent roles at 20% were at SHE Management level. The least frequent roles were in the artisan trades and office administrative roles at 13% each respectively.

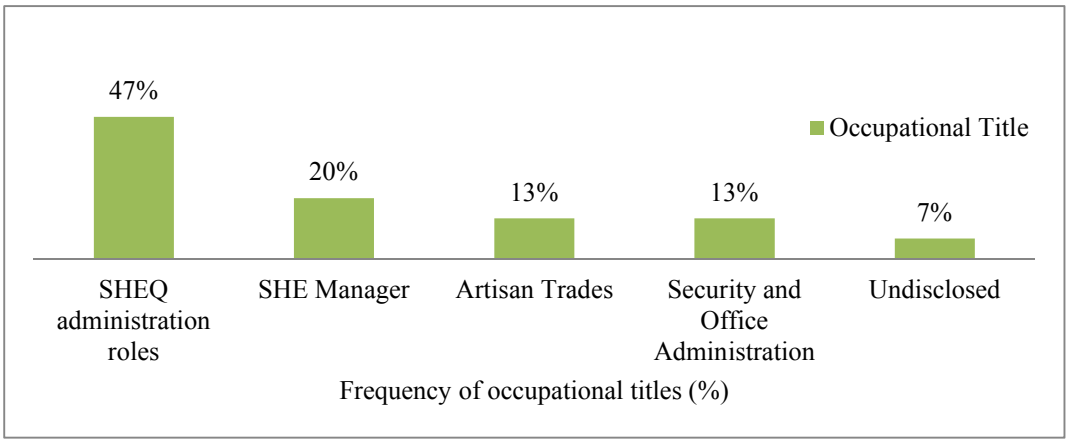


Figure 5.6: Occupational titles of environmental trainee respondents (n=15)

5.4 Summary of Key Findings of the Respondent Profiles

The key findings profile the business respondents within the surveyed ISO 14001 certified businesses as having the following characteristics:

- High level of tertiary education to support their environmental competency roles.

- Environmental competencies are largely supported within the Safety, Health, Environment and Quality (SHEQ) management designations of the company.
- Age of the respondents commonly in the 30 to 39 year age range and newly established in their roles shown by the 1 to 5 year work duration period as dominant.
- The ISO 14001 businesses types are predominantly in manufacturing; however transportation and storage, petrochemical and business services are also common in this sample.
- Shows the likelihood of the ISO 14001 companies as SME sized businesses having predominantly under 250 employees.

The key findings of the other respondents have the following characteristics:

- The environmental trainees are from various different business types but predominantly from manufacturing, transportation and storage and industrial and business services. The majority (60%) of these business are ISO 14001 certified.
- The businesses represented by the environmental trainees are likely SMEs predominantly with fewer than 250 employees.
- The environmental trainees have entry level environmental competencies in their companies and these are commonly within SHEQ departments.
- The education level of the environmental trainees are predominantly at a high school level and represent a younger workforce and newly established in their roles in the under 30 year age range with 1 – 5 years work duration.
- The Training Professionals are newly established in their environmental competency roles with 1 to 5 years work duration. They have high school and diploma level qualifications to support their environmental competency training roles.

The summary of the key findings make clear two specific points that can be related back to the literature and conceptual framework presented in Chapter 2 and 3 of this study:

- Environmental Management and the role of environmental training is a relatively new change or addition to business practices. This is reflected in the Durban businesses as respondents predominantly have less than 5 years experience in their roles. This indicates that the Durban businesses sampled are developing environmental competencies rather relatively recently. Orr (2012), for example describes South African businesses in a state of transition, affirming the need for businesses to develop

key environmental skills to undertake and oversee sustainable business practices and manage environmental risks.

- The predominance of manufacturing business types in this sample indicates this business type prioritises the implementation of ISO14001 EMS. Similarly, this correlates with the eThekwini IDP which identified that the 22% Provincial GDP contribution is supported through Durban's manufacturing activities located within the petroleum, fuel, rubber and chemical industries (eThekwini Municiplality, 2014: 30). As Van der Linde (2009), indicates environmental impacts are stringently regulated specifically aimed at controlling emission and pollutants in industry. The focus on clean production and developing the requisite skills for undertaking this is indicated in this Durban sample. This is similarly supported by Unnikrishnan and Hedge (2007: 428)stating, "cleaner production requires new attitudes, knowledge and skills for all professionals to ensure that preventive environmental strategies are integrated into planning and development activities across society."

5.5 ENVIRONMENTAL KNOWLEDGE, ATTITUDES, AND CULTURE

The next set of questions posed to the environmental trainees and the business respondents aimed at gaining a perspective on basic environmental knowledge and awareness and attitudes regarding environmental issues. The question on environmental knowledge is indicated by responses to questions of waste management and recyclable products, pollution, and renewable energy and resources. Their attitudes are also assessed as this will create a better understanding of this samples behavioural response to the process of change that environmental management in the workplace invariably entails. The 'environmental' attitudes of employees are assessed as it is linked to the willingness of employees to bring innovative solutions to their business-specific environmental impacts. The role of innovation in effective environmental management practices is imperative and therefore the respondent's perception of company culture that promotes environmental innovation is further enquired.

Table 5.4 shows the basic level of environmental knowledge and on average the business respondents answered 84 % of the questions correctly which shows a high level of basic environmental awareness and knowledge. The questions with the lowest correct responses (63 %) were on the prioritisation of waste minimisation. However, knowledge of recyclable products is high at 100% correctly answered. The environmental trainees on average answered

74 % of the questions correctly. The lowest scoring question (33%) related to the effects of air pollution that causes acid rain. However, the highest scoring questions (100%) related to air pollution impacts caused by the burning of petroleum. The other high scoring (100%) question related to natural renewable resources.

Table 5.4: Baseline environmental knowledge of business respondents and environmental trainees

	Environmental Trainee Respondents (n=15)	Business Respondents (n= 24)
MULTIPLE-CHOICEQUESTIONS	Correctly Answered (%)	Correctly Answered (%)
Which of the following is better for the environment	60	63
The air emissions from the burning of petroleum contributes to	100	96
Which of these emissions cause acid rain	33	79
Which of the following are natural renewable resources	100	83
Which of the following are natural renewable energy resources	60	83
Which of the following are recyclable	93	100
Average	74%	84%

The questions posed here assess tacit environmental knowledge. Tsoukas (2011), for example expounds tacit knowledge is the seemingly unconscious but complexly acquired knowledge or awareness of a subject matter. In addition Gorelick *et al.* (2004) adds that tacit knowledge is acquired through cultural experiences. In this sense, the business respondents show a higher level of tacitly acquired awareness of environmental issues than the environmental trainees and this could indicate that the business respondents are positioned in workplace cultures that promote environmental awareness more strongly.

Regarding the understanding of the role of ISO 14001 EMS as shown in Table 5.5, the business respondents responded correctly (100%) showing an understanding of the role of the EMS in impact mitigation. The environmental trainees showed a good but comparatively limited understanding. Knowledge of environmental management in the workplace was assessed further as shown in Table 5.6. The business respondents showed a complete understanding (100%) of the definition of ISO 14001 certification. This is consistent with the fact that the sampled business respondents are from ISO 14001 certified businesses. However, the environmental trainees sample shows a limited understanding of ISO 14001 certification and

the difference between environmental management and environmental health in the workplace. The 66 % of environmental trainees that answered correctly show a correlation to the environmental trainees' respondent profiles showing 60 % of the environmental trainees are from ISO 14001 certified businesses. The correlation suggests employees from ISO 14001 certified businesses have better understanding of environmental management in the workplace.

Table 5.5: Respondent's understanding of EMS impact monitoring

As part of a robust ISO14001 system, regular monitoring of significant environmental impacts is required.			
	True	False	Unsure
Business Respondents (n=24)	100	0	0
Environmental Trainees (n=15)	67	7	26

However, most of the business respondents understood the difference between environmental management and environmental health (87.5%) but it is apparent that the two terms can sometimes be conflated as shown by the 12.5%. Noting the distinction between environmental health and environmental management, Boer *et al.* (2009) elaborates that Environmental health relates to human health and wellbeing and is predominantly managed under the Safety and Health departments of a company. Environmental management on the other hand, although implicitly protects human health from environmental related risks, is instead concerned with preventative management of environmental aspects of products, processes and activities that may cause unacceptable risk and negative environmental impacts (Nel and Kotze, 2009).

Table 5.6: Respondent's understanding of an EMS

	Environmental Trainee Respondents (n=15)	Business Respondents (n= 24)
Multiple-choice questions	Correctly Answered (%)	Correctly Answered (%)
What is ISO 14001	66	100
Is there a difference between environmental health and environmental management	66	88

Further to this the respondents were asked if they understood the company's environmental policy, with results shown in Table 5.7. The business respondents show that 87% claim to know their companies environmental policy while 13% knew of it but admit it remains poorly understood. The environmental trainees predominantly had knowledge of their company's

environmental policy but a significantly high 33% showed they did not know it or had poorly understood it. The importance of including the environmental policy as part of organisations environmental training is made explicit in the ISO 14001 standard (2004: 6). Furthermore, the environmental policy of a company embodies the vision and direction a company aims to take to establish and improves its environmental performance and is defined as follows in ISO 14001 (2004:3), "Overall intentions and direction of an organisation related to its environmental performance as formally expressed by top management."

Table 5.7: Respondent's knowledge of their company's environmental policy

Knowledge of company's Environmental Policy	Yes (%)	No (%)	Poorly understood (%)
Business (n =24)	87	0	13
Environmental Trainees (n=15)	67	20	13

5.5.1 Attitude towards Environmentally-conscious Behaviour

Personal values and environmental attitudes of managers and staff are an important causal link to favourable environmentally-conscious behaviours and decision-making in the workplace (Papagiannakis and Lioukas, 2012). The attitudes of the business respondents were consequently examined in addition to perceptions of company culture regarding environmental responsiveness. The importance of employee and management attitudes and culture has been established earlier in Chapters 1 and 3. Figure 5.7 presents the responses of personal values and attitudes towards environmentally aware behaviours. All of the respondents agree to strongly agree to a positive attitude towards the environment outside the workplace with strong positive behaviours shown in the use of energy efficient lighting, waste recycling and carpooling. Personal values of managers are shown to be effective predictors of environmental adaptability in the workplace as commented by Papagiannakis and Lioukas (2012:43) who states that "managers are more likely to change the way their firms operate, if that change is in line with their personal values". The responses therefore correlate with this idea positively as management level responses show high personal environmental values and attitudes in the ISO 14001 businesses sampled.

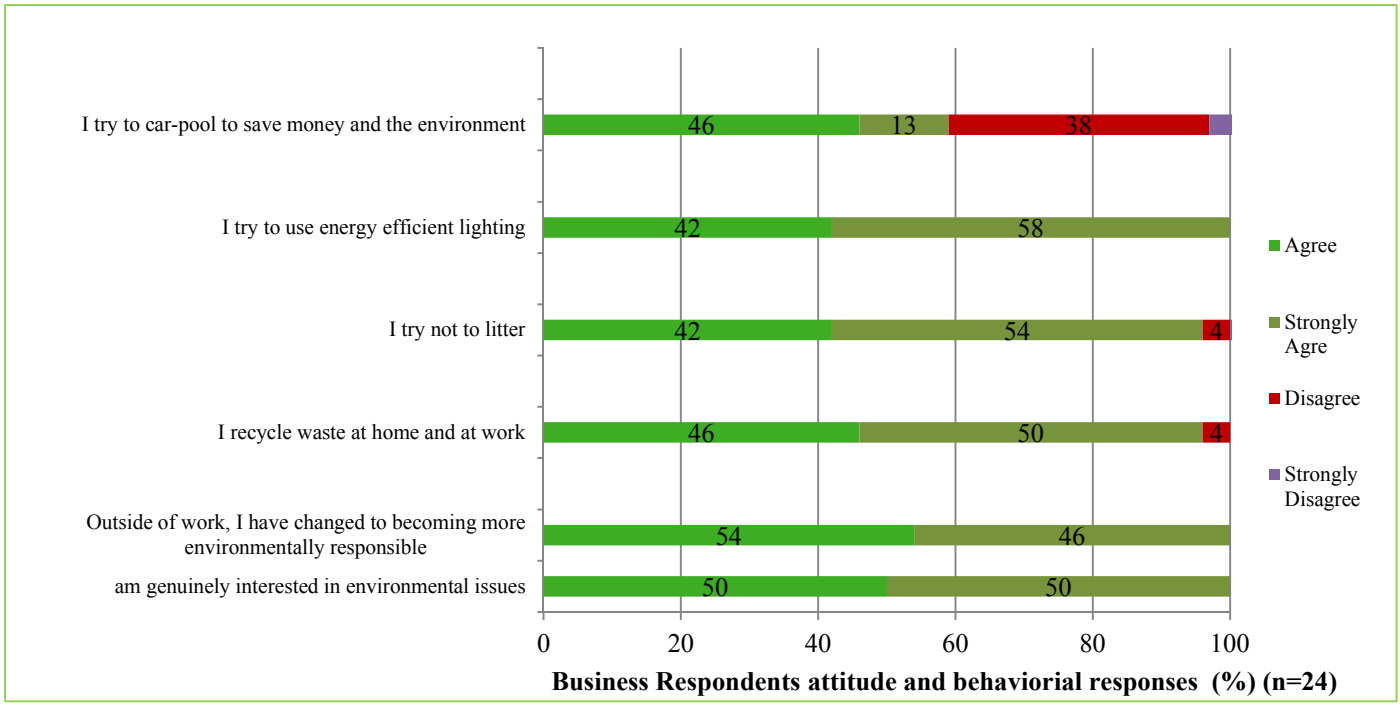


Figure 5.7: Business respondent's environmental attitudes and behaviours (n=24)

5.5.2 Attitude toward considering the environment in business decision making

As shown in Figure 5.8, the business respondents strongly agreed to understanding the impacts of their business activities (83%) and to the importance of environmental issues in business (83%). This shows an environmentally aware attitude towards corporate environmental sustainability. In addition the ease of environmental decision making within this context is examined and shown in Figure 5.8. Seventy nine percent (79%) of business respondents strongly agree to consider environmental issues in decision making while a small percentage (4%) of respondents did not feel comfortable to do so.

Furthermore, Figure 5.8 shows that the all respondents are aware of business impacts and the business resources and finances that must be prioritised for effective environmental management. This is shown by an overall 100% agreement to this assertion in Figure 5.8. This indicates critical decision making in terms of resources and finances are likely to be positively undertaken in these businesses. Lesourd and Schilizzi (2001), explains that managing environmental impacts is costly and includes acquiring high-tech equipment, technical expertise and training resources and time.

Figure 5.8: Business Respondents: Attitudes towards considering the environment in decision-making (n=24)

5.5.3 Perceptions of the environment in company culture

The culture of the company is also queried as this indicates if there is a tendency to embrace environmental change in decisions and strategy that is informed through environmental training. Hutchinson (1996), for example emphasises that creating an environmentally aware culture is an important business strategy to accomplish adaptable and sustainable business practices and behaviours. In addition environmental issues present a significant change to business strategy and a good environmental company culture can promote change adaptability positively (Baird and Henderson, 2001). As shown in Figure 5.9, the individual question responses indicate that the business respondents agree to strongly agree (96%) that mainstreaming environmental issues in business is a change to business as usual while 96 % of respondents agree to strongly agree that their companies are adapting to this change accordingly. Further, the business respondents strongly agreed with the assertion that there is strong leadership role in promoting environmental issues in their companies. This is shown by a response of 71% in strong agreement to this assertion. Furthermore all the respondents agree to strongly agree that their companies are environmentally progressive.Fourie *et al.* (2012), emphasises that responsible leadership is critical to promote a learning culture in the workplace by encouraging skills development that give employees the confidence to integrate environmental decisions in their daily work routines. As the business respondents represent management competencies, these responses also show their willingness to lead a decisive culture of environmental learning in their companies. The responses also show a positive perception of the environment is being promoted in their business culture.

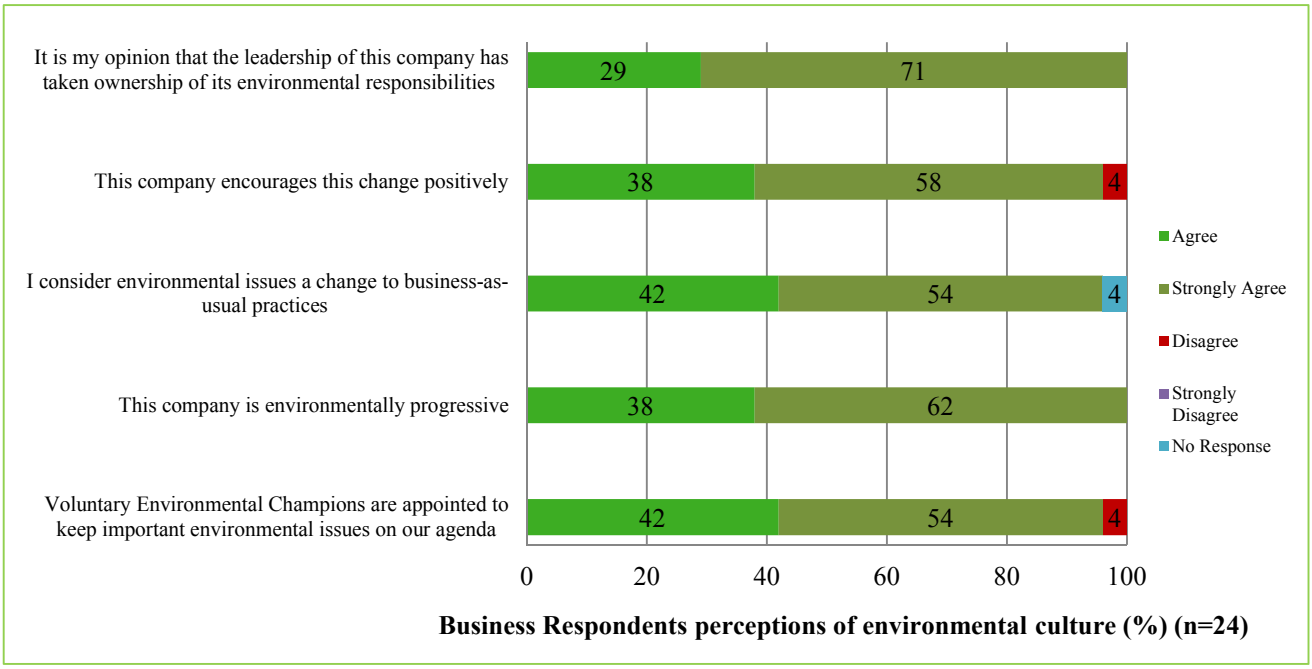


Figure 5.9: Business respondent's perceptions of environmental culture (%) (n=24)

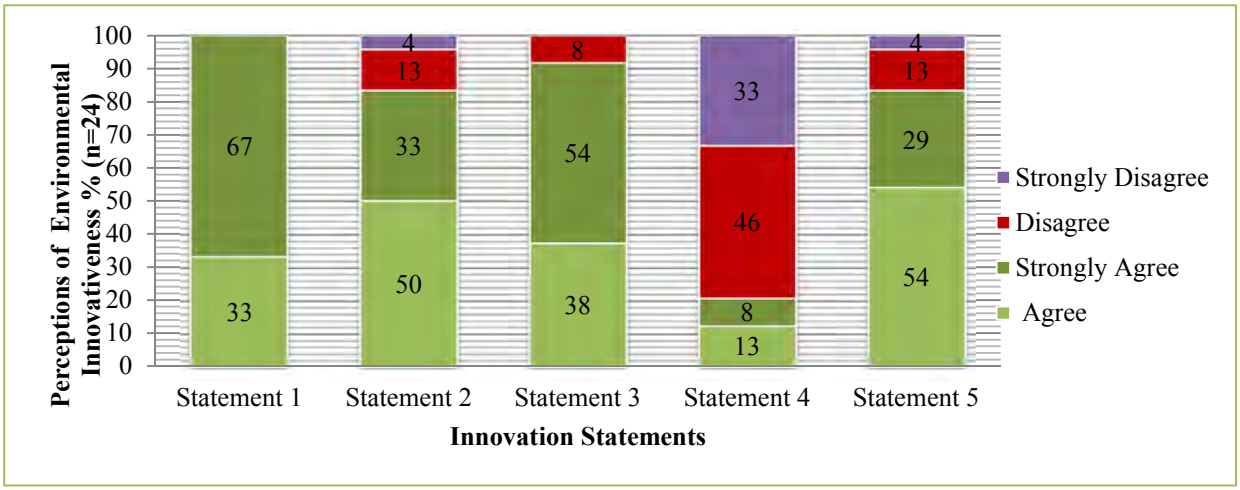
In addition Figure 5.9 shows that there is a strong agreement to the appointment of Environmental Champions as confirmed by 96% of the Business respondents. Meima (1997) confirms although management leadership is essential for steering the environmental management culture in a firm, it is sustained by employee buy-in and participation through bottom-up approaches such as the appointing of environmental champions in the workplace. The strong agreement to this shows that the business respondents are intimating an organisational culture that increasingly embraces environmental values.

The environmental trainees similarly show a strong agreement to the attitudes discussed for the business respondents in Figures 5.7 to 5.9. The summary of total responses to all these attitude questions, show that 68 % of the environmental trainees agree and 22% strongly agree to the attitude statements, while 10 % disagree to the attitude, behavioural and cultural questions. It shows that the environmental trainees similarly have an overall good attitude and perception of environmental issues in their business contexts but comparatively less so than the business respondents.

5.5.6 Perception of Innovation among the Business and Environmental Trainee Respondents

Innovation is the ability to adapt nimbly to market pressures for greener and more environmentally sustainable business products, services and activities (Porter and Van de

Linde, 1996). A culture of environmental innovation is encouraged through environmental training at the organisation level and is an important management approach that can stimulate the development and use of cleaner production technologies for example (Van den Berg *et al.*, 2013). Furthermore, Van den Berg *et al.* (2013) emphasises that green innovation reduces environmental impacts by fostering efficient resource management and waste reduction. Figure 5.10 shows the responses of the business respondents to the culture of innovation in their businesses. The business respondents all agree (33%) to strongly agree (67%) that environmental training enables greater innovation in business. In contrast Statement 4 responses reveal that respondents are confident of their company's innovation culture however 21% of the respondents reveal that their companies can be innovation-averse. Regarding Statement 2, 3 and 5, respondents reveal that innovation though predominantly adopted promptly when the opportunity exists, there is a tendency to overlook opportunities to adopt innovation measures.



Innovation Statements

1. Environmental Training enables better innovation in business
2. In our business, environmentally sound technological innovations are quickly accepted when they are available
3. In our business, management participates actively in the search for new and innovative environmental ideas
4. In our business, innovation is perceived as risky and there is a resistance to innovation
5. In our business, environmental innovation is quickly accepted in project/program management

Figure 5.10: Business respondent's perception of environmental innovation

The environmental trainees responded similarly showing an overall 82% agreement and 8% strong agreement to the Innovation Statements. The environmental trainees also show full agreement to the Statement 1 assertion that environmental training enables a more innovative

business culture. The environmental trainee's responses are similar in comparison to the business respondents. This shows a similarly positive culture of innovation in the environmental trainee's organisations (See Appendix 2).

The business respondents overall present through these findings that there is a positive culture of green innovation in their companies. This is supported by the finding in Figure 5.10 that environmental training is agreed to be an important contributor to innovation which is further supported by Van den Berg *et al.* (2013) who states that ISO 14001 certified businesses are more likely to embrace innovation as part of waste, pollutant and energy reduction measures through increased environmental awareness training efforts.

5.5.7 Proactive Environmental Strategies

The awareness and level of agreement with implementation of PES was assessed. Figure 5.11 shows the responses to the individual questions posed to the business respondents. Aragon-Correa (1998), identifies two postures a company can take towards environmental management, one that is reactive or end-of-pipe focused or one that is proactive and able to anticipate and prevent negative environmental impacts in its operations. As discussed in Chapter 3, PES is characteristic of an approach to environmental management that goes beyond compliance (Vidal-Salazar *et al.*, 2012). Environmental training is most effective in companies with a proactive posture towards environmental issues as this ensures that environmental training will be deployed strategically in the environmental management of the organisation (Blackburn, 2008).

The business respondents predominantly agreed (68%) that their company is proactive in its environmental management. Figure 5.11 reveals that environmental audits are the most commonly (96%) implemented proactive strategy among the business respondents. ISO 14001 (2004) prescribes the use of regular environmental audits toward a process of continual improvement. The business respondent's majority response in conducting environmental audits is therefore consistent with the proactive ISO 14001 EMS prescription. Furthermore, proactive resource planning and efficiency in terms of reducing water use and energy consumption was confirmed by 79 % and 83 % of the respondents respectively. Environmental impacts are also proactively managed as shown by 88% that agreed that their companies have a waste recycling program and use non-pollutant products in its business operations. The responses also show

that although the use of renewable energy is indicated by only 46 % of the Business Respondents, 71% agreed their company plans its energy consumption use, which is indicative of proactive energy resource planning. The responses however show there is limited interest towards the sponsorship of environmental community projects. In addition only 63% agreed that they proactively initiate environmental best practices standards information-sharing with their clients. For example, Blackburn (2008) elaborates that collaborating with like-minded businesses through sharing research and best environmental practices creates constructive peer pressure and promotes environmental sustainability and innovation in the industry.

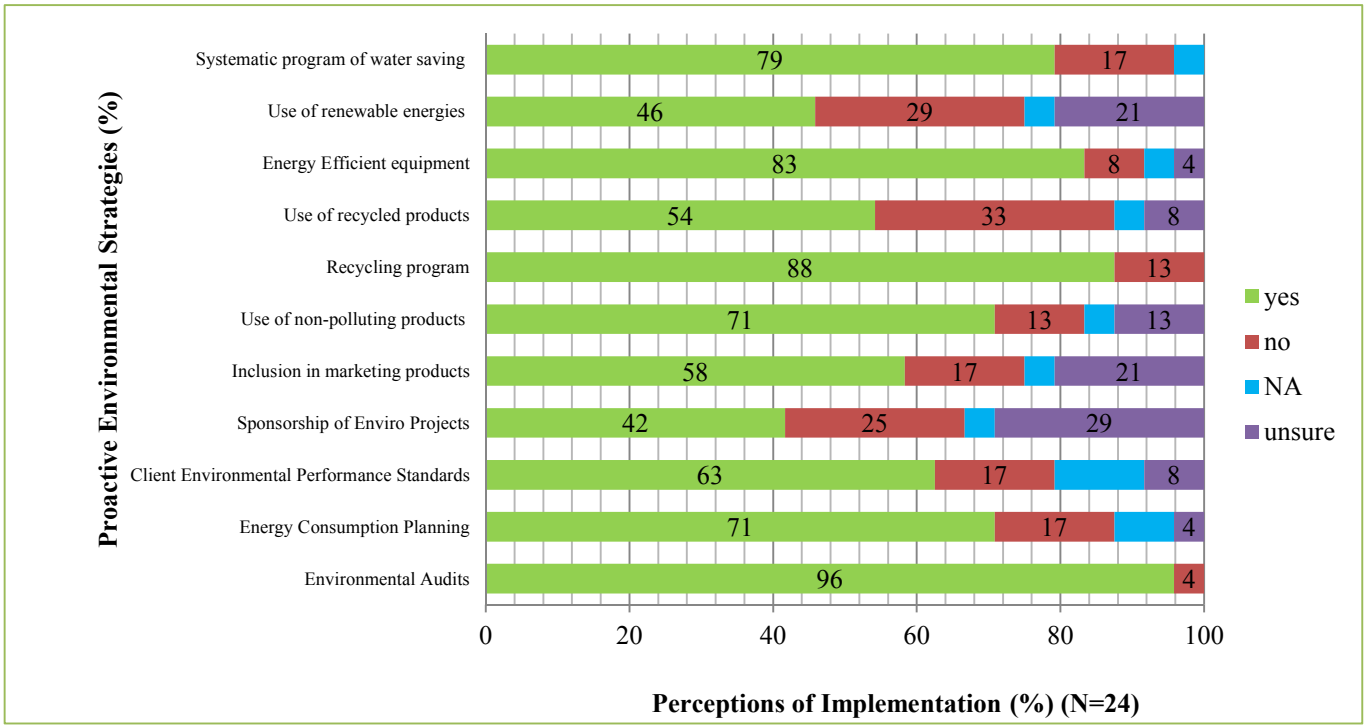


Figure 5.11: Business respondent's perceptions of implemented proactive strategies (n=24)

The environmental trainees show an overall high percentage (22%) of responses indicating that they are unsure of PES, however over 55% showed an overall confirmation of these strategies being implemented in their businesses. The individual question responses are detailed in Figure 5.12. The highest responses are for the 'Use of Energy Efficient Equipment' which is affirmed by 80% of respondents. This is followed by 'Use of Recycled Products' and "Recycling Program' by 67% of respondents, respectively. Significantly, is the consistency of the business respondents regarding the use of Energy Efficient Equipment, which show there is significant proactive attention to this in the sampled Durban businesses. The overall responses show that

there is good proactive approach to environmental management in the Durban businesses sampled which creates a conducive context for effective environmental training.

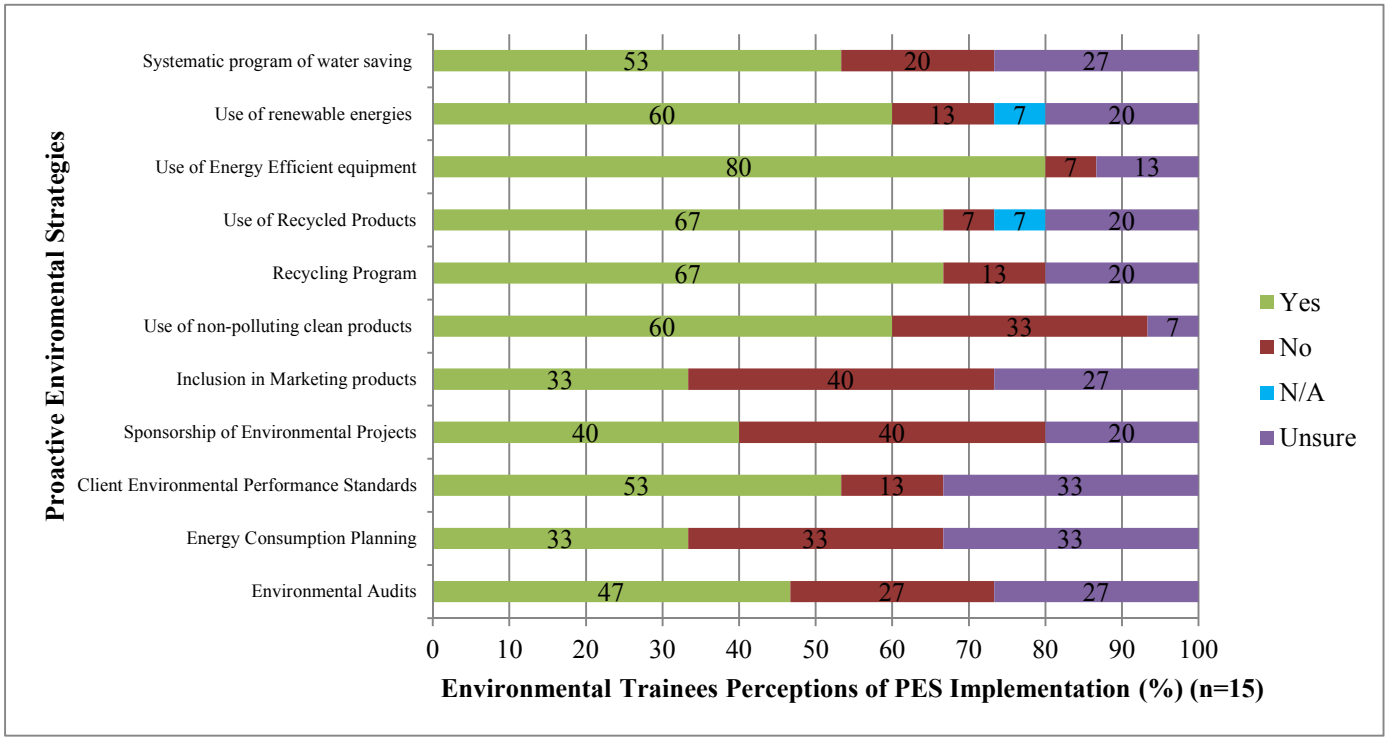


Figure 5.12: Environmental trainee's perceptions of implemented proactive strategies (n=15)

5.6 Environmental Training: Commitment, Resources and Methods

Commitment to environmental training is indicated by frequency of training, resources committed in terms of cost and expertise as well as company-wide exposure to environmental training. The business respondents were posed questions on the practical implementation of training received including how training is conducted in terms of utilised expertise and environmental training topics covered. This section reveals the responses of the Business Respondents. The perspectives and responses from the environmental trainees and other respondents are also presented where it adds relevance to ISO 14001 business respondent findings.

Table 5.8: Priority of environmental training

Is environmental training a priority in this company	Yes (%)	No (%)
Business (n=24)	83	17
Environmental Trainees (n=15)	73	27

In assessing the priority environmental training receives, Table 5.8 shows that the business respondents predominantly agree (83%) that environmental training is a priority in their companies while 17% conceded that that it is not a priority. In addition, the environmental trainees, of whom 60% are from ISO 14001 businesses in this sample, predominantly considered environmental training a priority (73%). However, a comparatively large proportion of the sample (27%) conceded it was not a priority. The other respondents as shown in Table 5.9 contend Durban businesses are reactive in their attitude towards environmental training however indicate that there is an increasing interest. Furthermore, one of the environmental trainers indicated that Durban businesses in general have a poor interest in environmental training activities.

Table 5.9: Other respondents view of Durban businesses attitude to environmental training

	Reactive	Increasing interest	Poor interest
DCCI		✓	
Trainer 1			✓
Trainer 2	✓		
SEDA	✓	✓	

5.6.1 Financial and Human Resource Commitment for Environmental Training

The responses as shown in Table 5.10 and Table 5.11 further reveal the practical implementation of the training and to what extent environmental training is a priority. Table 5.10 shows the response of the business respondents regarding financial resources committed to Environmental Training. In consideration of 83% of business respondents asserting that environmental training is a priority, only 38 % commit over R60, 000 per annum on environmental training.

Table 5.10: Business respondent's training budget per annum

Training Budget (R)	*Percentage of Frequency (n=24) %*
0-20 000	17
20 000- 40 000	4
40 000 – 60 000	4
Over 60 000	38
Unsure	37
Total	100

The inability to confirm a training budget by 37% of respondents indicates that budget allocations are not routinely prioritised for environmental training. In addition 4% of respondents report under R40 000 per annum expenditure on environmental training. The budget allocation figures are considered low in relation to the business respondent employee number profiles discussed earlier, which shows 71 % of the ISO 14001 businesses in this sample, have between 30 to 400 employees in each company. There are no environmental training budget benchmarks available however as discussed in Chapter 4, the SETAs and SARS administrate a national skills levy payable by most businesses. In line with this the National Skills Accord has indicated that companies should commit 1 % to as much as 5% of its annual payroll to skills development (Department of Economic Development, 2011a: 3). The allocation towards environmentally training is not explicit but given the national impetus to developing environmental skills, a sizeable portion of this percentage for environmental training is justifiable. Given this, the training budget allocation of business respondents as shown in Table 5.8 is considered low.

As shown in Table 5.11 the environmental trainees, though not considered professionally positioned to answer questions on budget allocations, 40% agreed that their companies invested sufficient resources to environmental training. This presents a considerably low perception of resource allocation for environmental training.

Table 5.11: Environmental trainee's perception of resource allocation for environmental training

Environmental Trainees: Does your company invest significant resources, time and cost into environmental training (n=15)	Yes (%)	No (%)	Unsure (%)	Total
	40	*27*	*33*	*100*

There is an established link between top management commitment to company environmental issues and the allocation of sufficient resources to enable environmental performance (Tung *et al.*, 2014). The financial benchmarks for environmental training are not available however inherent and stipulated financial commitment is required in the ISO 14001 EMS. Furthermore, researchers indicate that financial commitment improves the chances of positive environmental performance and environmental training outcomes (Perron *et al.*, 2006). However, environmental training can sometimes be falsely perceived by managers as a risky investment compared to other training needs (Vidal-Salazar *et al.*, 2012).

Table 5.12 shows the response to the availability of human-resources for undertaking training activities and 83% of business respondents affirm there is dedicated personnel that oversee environmental training. However, the Environmental trainees confirm that only 60% of their companies have dedicated personnel to oversee training in their companies.

Table 5.12: Commitment of human resources for environmental training

Are there dedicated personnel to oversee training	Yes (%)	No (%)	Total
Business (n=24)	83	17	100
Environmental Trainees (n=15)	60	40	100

In enquiring further as to training providers used by the business respondents companies, these results are shown in Figure 5.13. Consistent with the previous finding by the business respondents that 83% have dedicated personnel to oversee training, they similarly responded that the training is provided predominantly by in-house trainers (79%) and environmental managers (79%). Also used frequently at 58% are local training consultants. University and international trainers are sometimes used as indicated by 21 % of the Business Respondents.

As local training consultants, both training providers confirm they have been appointed by 10 to 30 companies in the last financial year to conduct environmental training. Furthermore, Trainer 1 confirms that 80% of companies requesting their services are ISO 14001 certified indicating a higher interest from ISO 14001 certified businesses. Trainer 2 however, disagrees and indicates only 8% of their environmental training clients are from ISO 14001 businesses. These additional perspectives although differing, confirm the mix of training service providers used by the business respondents with a greater tendency to use In-house trainers and Environmental Managers from within the company. Two of the business respondents (8%) commented that the 'other' consultants used is external environmental consultants, and internal-company group experts.

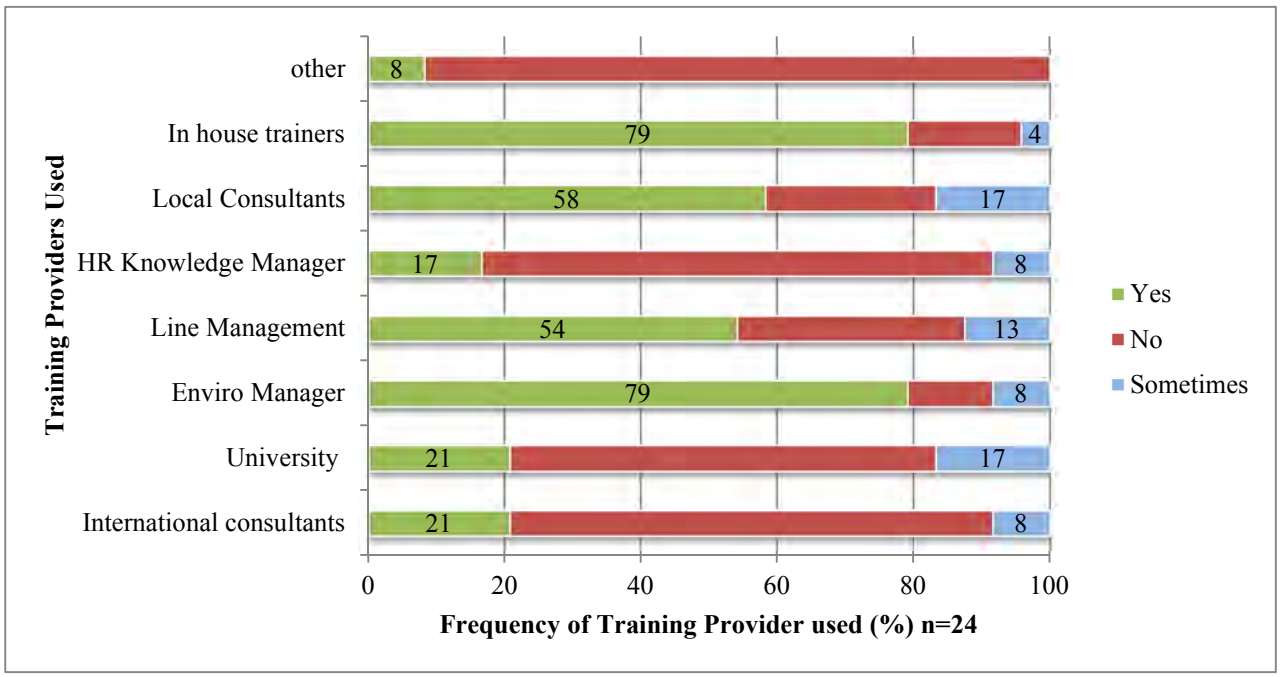


Figure 5.13: Business Respondents: Types of training personnel used (n=24)

The environmental trainees similarly presented that environmental training is most commonly conducted by in-house trainers, environmental managers and line management as shown in Figure 5.14. The regular use of local consultants is also presented by 33% of respondents. Similar to the business respondents, the least frequently used training providers are university and international consultants. Three (13%) respondents commented on the 'other' service providers used are first aid consultants, FET College course trainers and external environmental consultants. The comment on first aid consultants supports the previous finding that environmental health and environmental management are conflated terminology to some of the environmental trainee respondents.

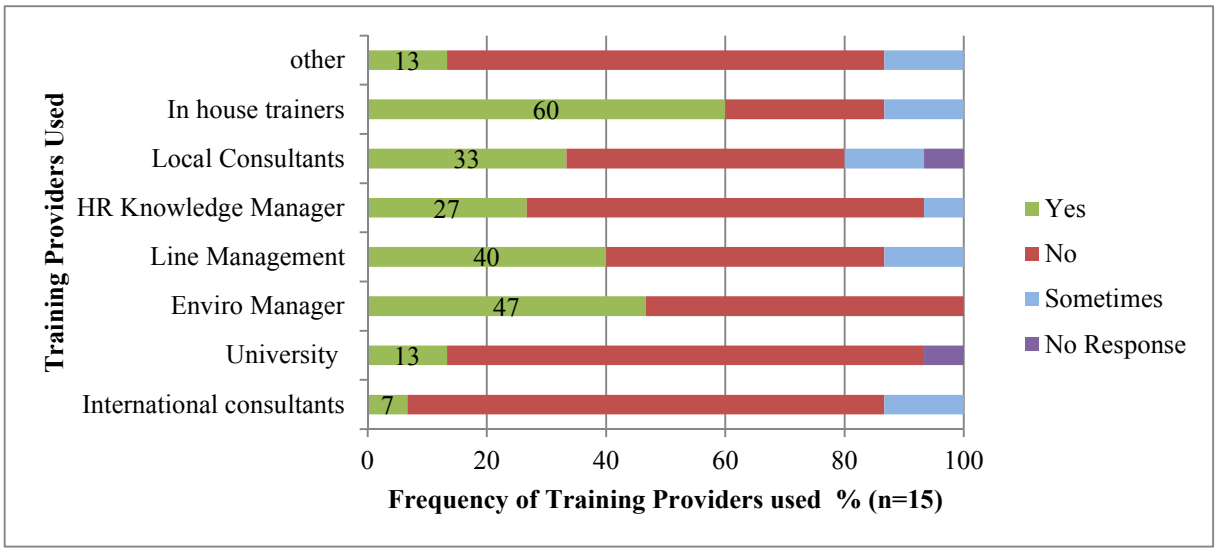


Figure 5.14: Environmental Trainees: Types of training personnel used

Figure 5.15 shows that the frequency of environmental training done. The business respondents confirm that they have mostly (50%) undertaken 1 to 2 environmental courses per annum while 25% attended 3 to 5 courses per annum. A smaller percentage of 8% attended over 5 courses per annum while 17 % conceded that they have not attended any environmental training. The environmental trainees show a higher attendance to environmental courses as shown by 53% that attended 1to 2 courses but a substantially more (27%) did not attend any environmental training courses. Therefore 1 to 2 courses are the predominant frequency for the sample groups as shown in Figure 5.14.

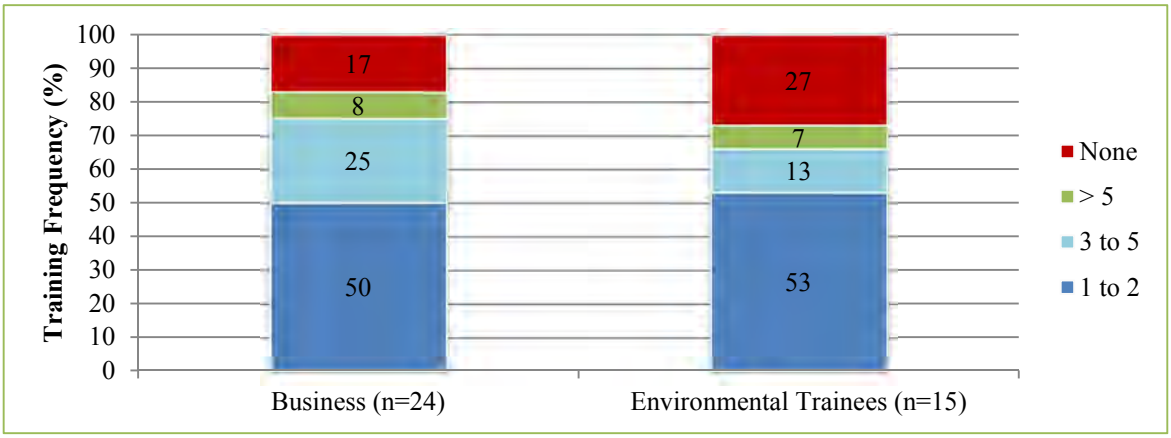


Figure 5.15: Frequency of environmental training courses per annum

5.6.2 Frequency of training and methods of training across the various tiers of company structure

Table 5.13 shows the summary of the business respondents multiple responses to the hours of training per annum that each company tier undergoes. The most frequent training duration reported by the 31 % of the business respondents is 1 to 10 hours per annum. However 25% of business respondents could not confirm the hours of training received by the different company tiers and indicated that training is attended as needed. Relative to over 80hrs/a, the responses shows that training occurs predominantly in under 80hrs/a.

Table 5.13: Business Respondents: Total collated responses for duration frequency of undertaken training per annum

Duration of training (hrs/a)	1-10	10 -20	20-40	>80	None	As Needed	No Specific Time	N/A	*Total*
Business Responses (%)	31	8	6	5	6	25	11	8	100

Importantly, Figure 5.16 presents the trend of employees (across various tiers) that do attend training less than 80hrs/a. It also shows the above 80hrs/a frequency. It is apparent that training is most frequently attended by lower tiers of company structures. Sixty seven percent respectively (67%) of business respondents confirm that factory level staff and temporary working staff have most frequently received training under 80hr/a. Office workers are also reported by 63% of Respondents to also frequently attend training under 80hr/a. Contractors attend less than 80 hr/training more frequently (54%) than supervisors (50%) and senior managers (50%). Junior Managers are reported to attend less than 80hr/a of training, more frequently (58%) than senior managers. CEOs, CFOs and directors are reported to attend training least frequently with CEOs reported at attending more frequently by 13% of Respondents.

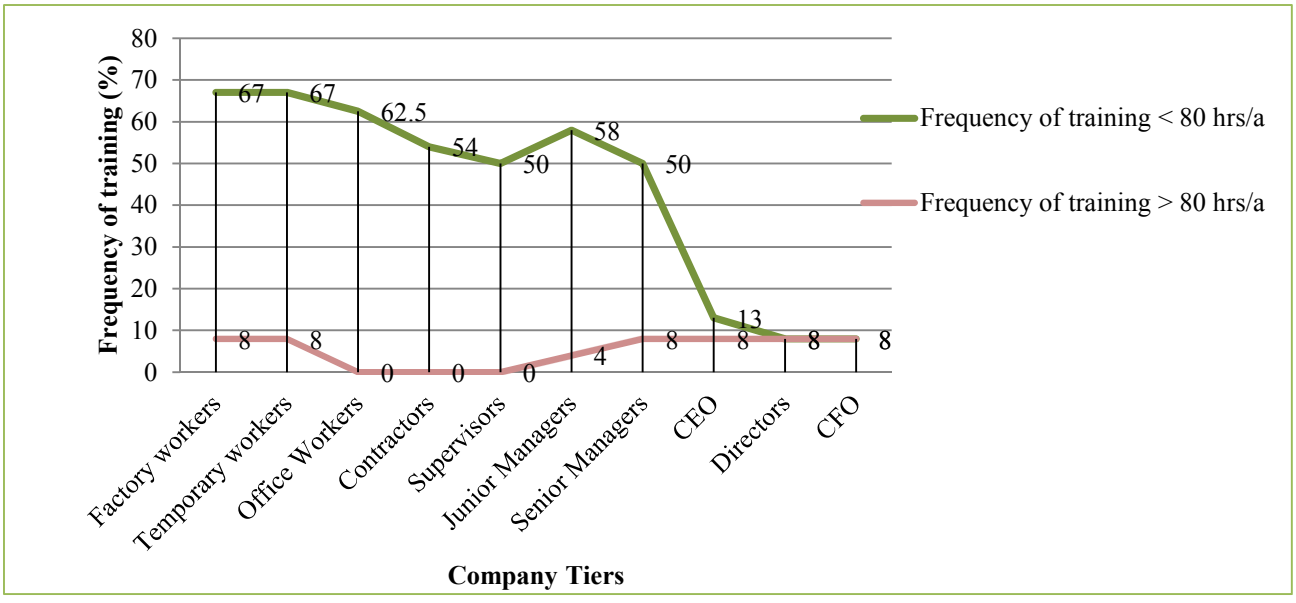


Figure 5.16: Business Respondents: Training frequency per company tier for under and over 80hrs/a (n=24)

Fewer than 10% of respondents however indicated that senior managers, CEOs, CFOs and directors as well as factory staff and temporary workers spend over 80hr/a on environmental training. It is interesting to note that the lower tiers of employees are equally frequently reported to have over 80hr/a as the executive tiers. Furthermore the trend-line in Figure 5.16 indicates a declining trend of company leadership in attendance at environmental training in the sampled Business Respondents. The respondent Trainers 1 and 2 concur similarly with this finding, indicating that CEOs, directors and CFOs rarely attend training while Trainer 2 acknowledges the attendance by these levels of company tiers are low they are increasing. Furthermore, both the Training Providers agree that the most frequently trained staff is junior managers, supervisors, and administrative/office staff, factory workers, temporary workers and contractors with senior managers less frequent at training events but have shown an increase in attendance.

The idea that top-down leadership involvement is environmental training is important is a long-standing one (Davis, 1991). There is a consistent call for all levels of an organisation to get involved in environmental training especially company leaders as this will importantly inspire the employees upon which impact management most depends to embrace the changes and new paradigm of environmental sustainability (Kashmanian *et al.*, 2010; Sakr *et al.*, 2010).The results show that there is an uneven frequency of training across the company tiers indicating that the executive levels are undertaking training significantly less than the lower tiers of staff.

5.6.3 Training Methods

After establishing the frequency of training by the various company tiers, it is further important to assess the types of training methods frequently used to train the different tiers of the company structures. Figure 5.17shows the response of the business respondents to the frequency of the various methods of training used per tier in their respective companies. All the training methods listed in Figure 5.17 are used across all the tiers with the exception of field trips which are used exclusively by supervisors, junior managers and senior managers. Correlating with the previous finding that factory and temporary workers undergo the most frequent training, these tiers also receive the highest frequency of onsite training and video training methods. Online training is used least frequently across all tiers however is most prominently and equally used among the directors, CFOs, and CEO tiers as shown by 23% frequency for each respectively. Furthermore supervisors, junior managers and senior managers mostly received training via workshops, onsite training and through the use of

company publications. Company publications are also most frequently used by the directors, CFOs and CEOs. Interestingly the company tiers of CFO, CEO and directors are most commonly reported to not receive any environmental training via any of these methods as confirmed by 26%, 14% and 17 % of respondents respectively.

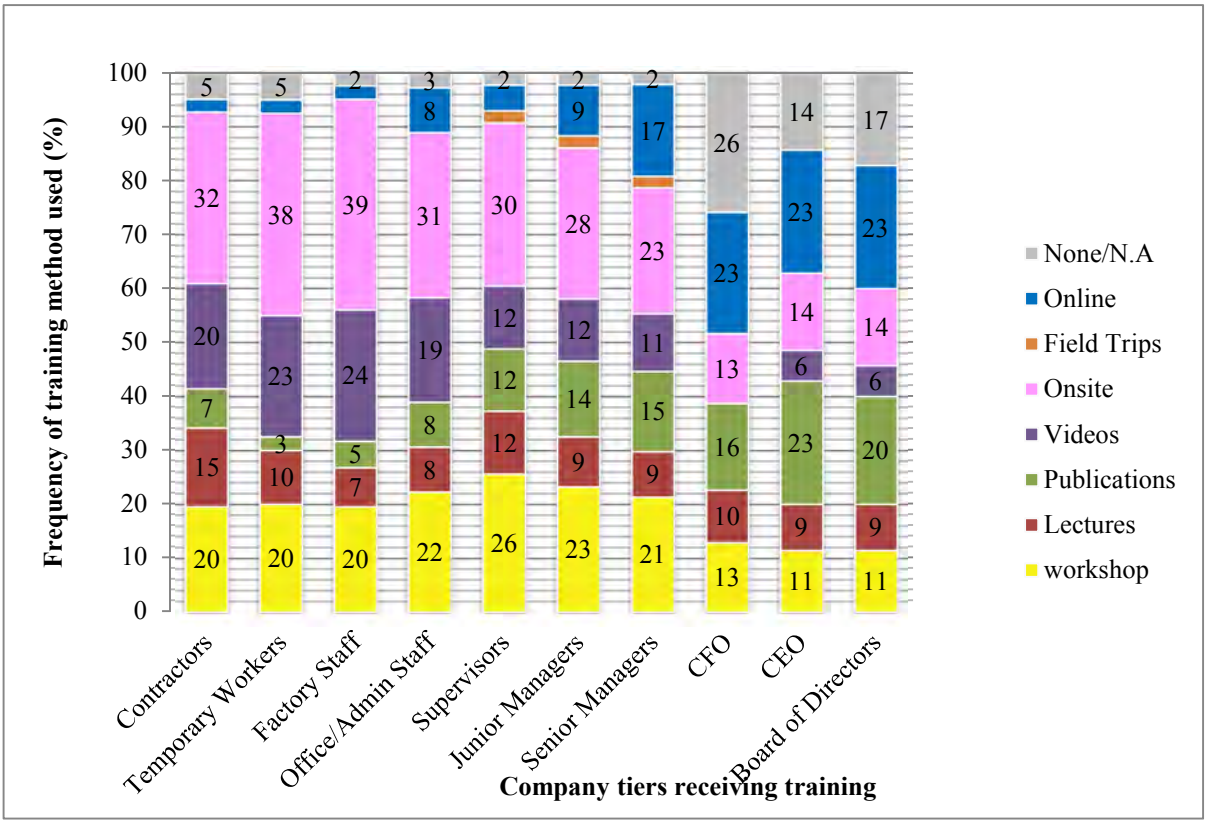


Figure 5.17: Frequency of training methods per company tier of business respondents (n=24)

Further perspectives are provided through Trainer 1 and 2 shown in Table 5.14. Their responses differ but do indicate a similar trend as in Figure 5.17 for the various tiers. The use of lectures and publication are prominently considered common use for CFOs, CEOs and directors. The use of publications and videos in management and executive tiers suggests that time-convenient and informal environmental information dissemination is preferred by these tiers.

Table 5.14: Other respondents: Training providers response of training methods used for various company tiers

Common Methods of Training per Company Tier	Trainer 1	Trainer 2
Board of Directors	Lectures	Publications
CEO	Lectures	Publications
CFO	Lectures	Publications
Senior Managers	Videos	Videos
Junior Managers	Videos	Workshops
Supervisors	Workshops	Workshops
Office/Admin Staff	Workshops	Workshops
Factory Staff	Workshops	lectures
Temporary Workers	Workshops	lectures
Contractors	Workshops	Publications

In addition the environmental trainees confirmed the methods of training they frequently encountered as shown in Figure 5.18. The environmental trainees which predominantly represent below management level of staff are most frequently trained through onsite training (87%), workshops (60%) and field trips (60%). The use of publications and online training methods are similarly least frequently used at 13% and 7 % respectively.

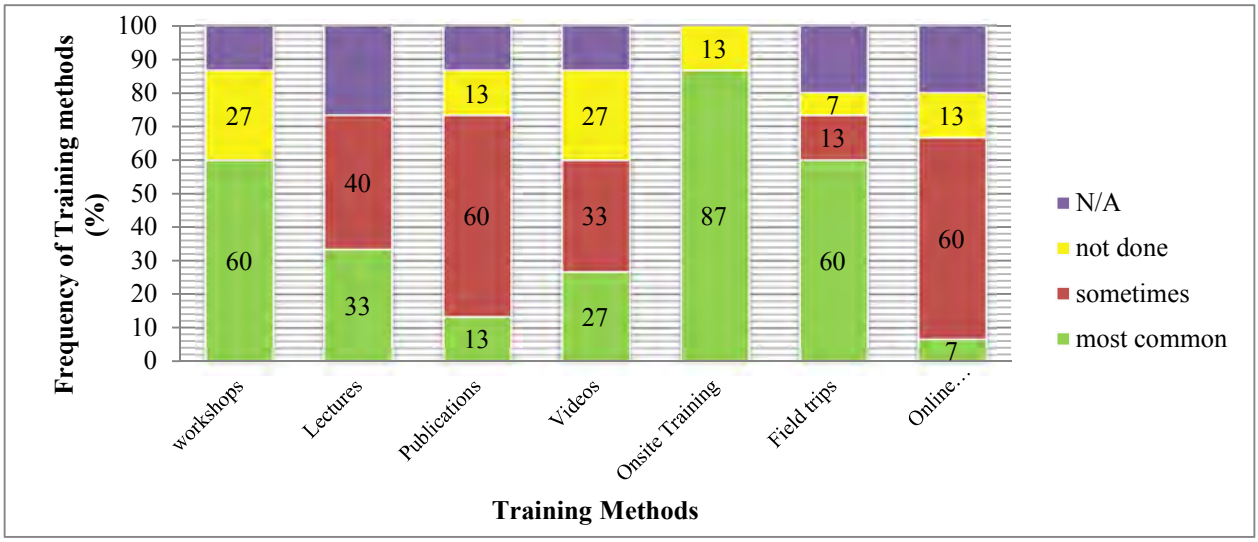


Figure 5.18: Environmental Trainees: Training methods used in environmental training (n=15)

Further to the methods of environmental training, is the degree of integration of environmental training with other training needs. The ISO 14001 EMS is commonly integrated with other SHEQ management systems as mentioned earlier in this chapter. The extent to which environmental training is integrated with other safety and health training has been assessed and Table 5.15 shows the responses of the business respondents and environmental trainees regarding this. The Business and environmental trainee respondents similarly predominantly

agree that environmental training is integrated with other training as shown by 63% and 66% respectively. Further in Table 5.13 as shown; only 11% of business respondents agree that environmental training is offered as a separate course. This is similarly reported by the environmental trainees. The business respondents indicate that environmental training is commonly conducted as part of company induction training (29%) and part of SHEQ training (24%). Environmental training is also confirmed as part of other training and environmental health training by 18 % of the business respondents respectively. A similar trend is apparent by the environmental trainee respondents with a slightly higher percentage (21%) than the business respondents indicating environmental training is part of environmental health training. Additionally both Training Providers agree that training is frequently integrated however, Trainer 2 confirms that environmental training is only sometimes offered as a separate course and Trainer 1 confirms that it is only sometimes integrated with induction training.

Table 5.15: Responses on combining environmental training with other training

Is environmental training conducted in combination with other training (%)				
	Yes	No	Sometimes	*Total (%)*
Business Respondents (n=24)	66	20	14	100
Environmental Trainees (n=15)	63	35	3	100

Responses on how training is conducted in relation to other training (%)		
	Business Respondents (n=24)	Environmental Trainees (n=15)
Part of SHEQ training	24	21
Integrated with other training	18	19
Part of induction training	29	28
Part of Environmental Health training	18	21
As a separate course	11	11
Total (%)	100	100

5.6.4 Environmental topic coverage in Environmental Training

One of the main goals of environmental training is to reduce environmental impacts of business operations by providing employees with the necessary skills to understand and reduce the company-specific environmental impacts (Jabbour, 2013a). Figure 5.19 shows the business respondents responses to the frequency of the environmental impact topics or content covered in the training they have received. Figure 5.19presents14 environmental impact training topics. There are 7 high frequency responses (over 90%) apparent for various impact training topics and these are ranked as follows: Waste management, hazardous chemicals, general

environmental awareness, energy efficiency, accident/spillage, water use and conservation and environmental legal liability and risk management. Waste management remains a topic covered most frequently as stated by 100% of Business Respondents. This correlates positively with the results shown in a previous Figure 5.11 regarding PES, which show the highest frequency of Business responses (88%) agreeing to an implemented waste recycling program. The least frequently reported (42%) environmental training received is production and manufacturing eco-efficiency. It incidentally also has the highest expressed need for further training by 50% of the Business Respondents.

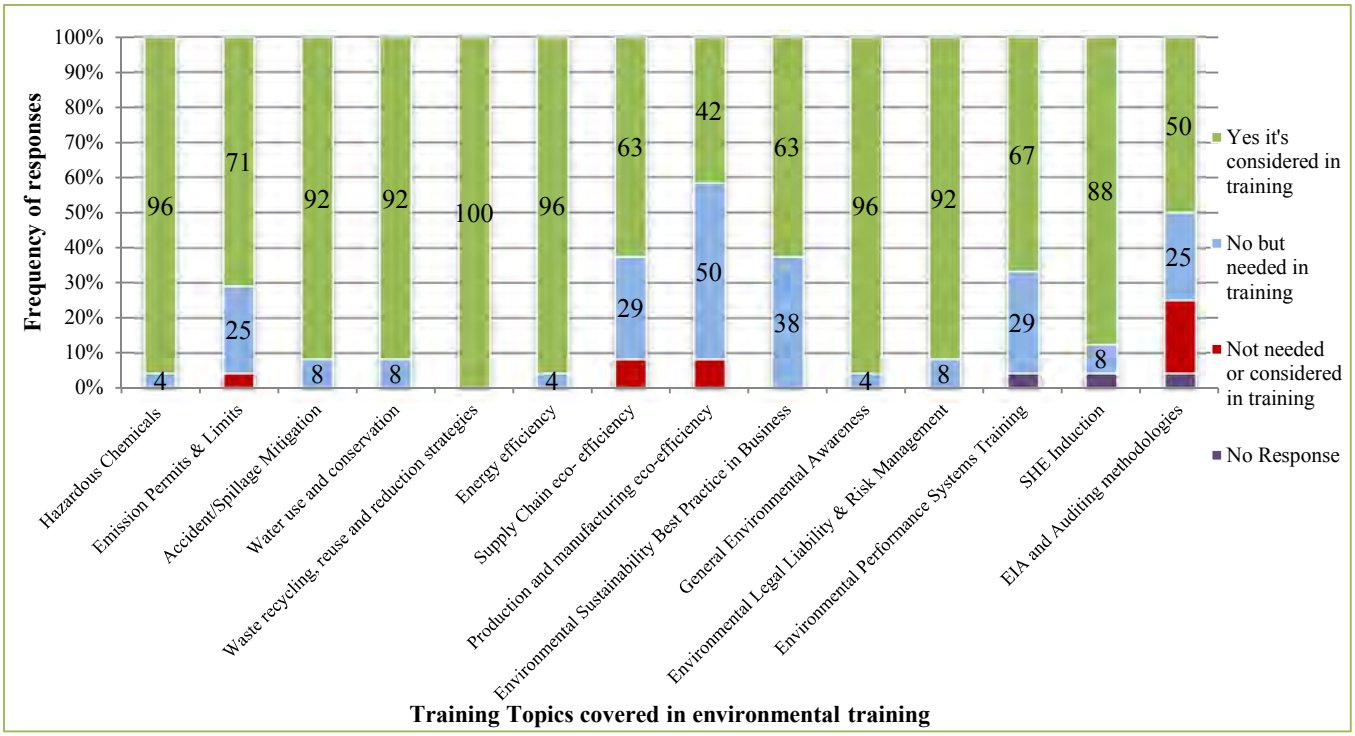


Figure 5.19: Business Respondents: Frequency of environmental training topics covered (%) (n=24)

Considering the business respondents needs for environmental impact training, Figure 5.20also indicates further training needs: Environmental Sustainability Best Practice in Business (38%), environmental performance and systems training (29%), supply chain eco-efficiency (29%), emission permits (25%) and, EIA and auditing methodologies (25%).

The environmental trainees responses to the environmental training received are shown in Figure 5.20. There are important differences from the business respondents that include the high frequency of respondents (87%) confirming that EIA and auditing methodologies are the most frequently covered impact training topic. In addition accidents and spillage mitigation, and environmental performance systems training are commonly covered training topics as

confirmed by 80 % of respondents respectively. Additionally hazardous chemicals, energy efficiency were frequently indicated as training topics by 73% of the environmental trainees respectively.

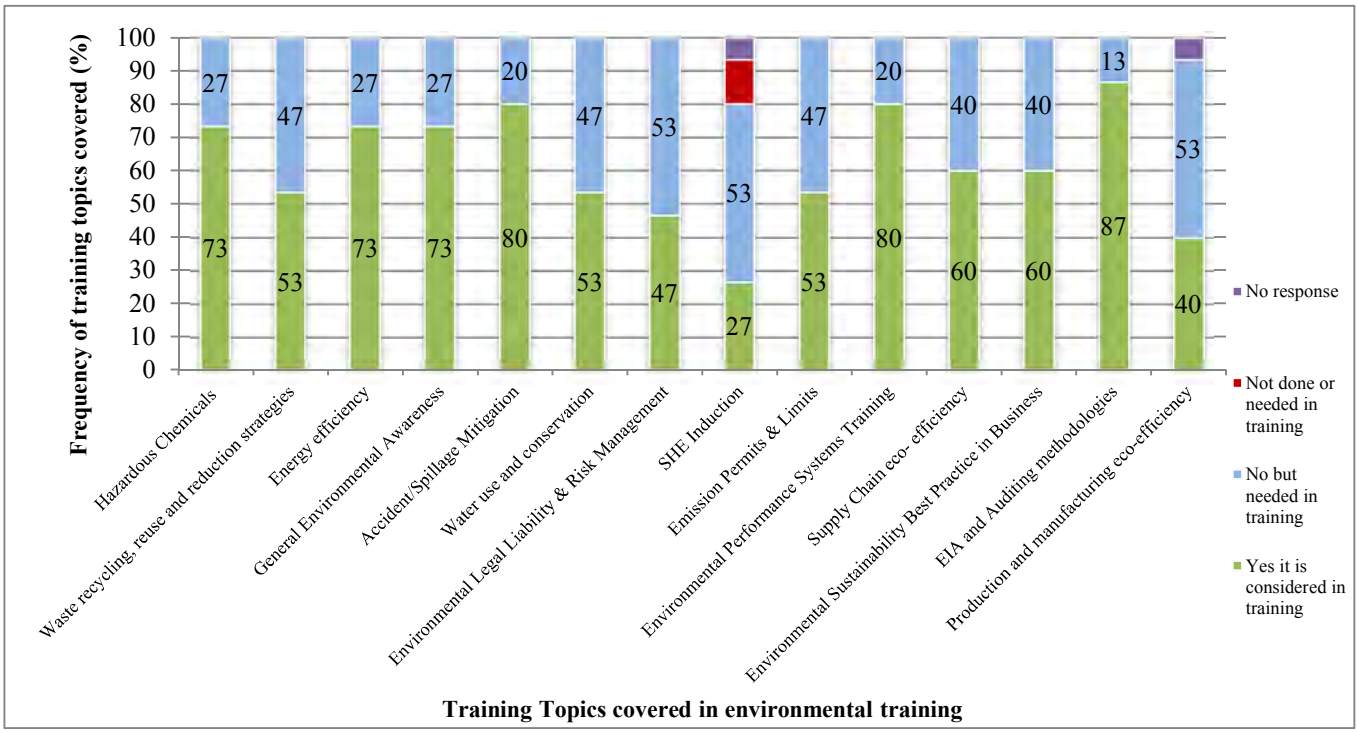


Figure 5.20: Environmental Trainees: Frequency of environmental training topics covered (%)(n=15)

The least frequently reported (27%) training topic is SHE induction and has also received the highest response at 53% for further training. Need for further training is indicated frequently across all training topics which are also different to Business Managers who only indicated a few topics for further training. However over 50 % the environmental trainees show training needs predominantly in SHE induction, environmental liability and risk management, and production and manufacturing eco-efficiency. Regarding the latter, 50 % of business respondents similarly indicated further training on this topic. The importance of introducing training dealing with environmental impacts of business activities is also identified by Perron *et al.* (2006) affirming that employees can make informed business decisions once the environmental impacts are known and equipped with knowledge of impact mitigation or avoidance.

The training needs and environmental topics covered as shown in Figure 5.19 and 5.20show dissimilar trends. Regarding further training needs, business respondents predominantly require further training in EIA methodology and auditing, and production, manufacturing and supply chain eco-efficiencies. The environmental trainees predominantly require further training topic coverage in production and manufacturing eco-efficiency, she induction and environmental legal liability. The training providers 1 and 2 agree that all these topics are covered in their environmental training except SHE induction and supply chain eco-efficiency and are incidentally the required training topics for the environmental trainee sample.

Further environmental training topics covered by SEDA and the DCCI Environmental Forum were enquired. The SEDA Respondent commented environmental topics covered in their training to new SMEs include hazard identification, introduction to ISO 14001 EMS, EIA regulations and Health and Safety Training. While the DCCI Environmental Forum Respondent confirmed they focus on environmental legislation and compliance topics.

5.7 COMMUNICATION OF ENVIRONMENTAL INFORMATION

ISO 14001 (2004:6) stipulates in section 4.4.3 the importance of regular communication of relevant environmental issues, "with regard to its environmental aspects and environmental management system, the organisation shall establish, implement and maintain a procedure(s) for internal communication among the various levels and functions of the organisation."In addition the communication of the environmental policy is also required in section 4.2 stating, "is communicated to all persons working for or on behalf of the organization, and is available to the public" (ISO 14001, 2004:4).Environmental issues therefore can cover aspects (potential to cause impacts), impacts and corrective actions. In addition communicating the company's environmental policy is to clients and a contractor is an EMS compliance activity. 'Environmental Communication' therefore is an informal means of promoting environmental information and awareness and is considered important for continual environmental improvement and performance.

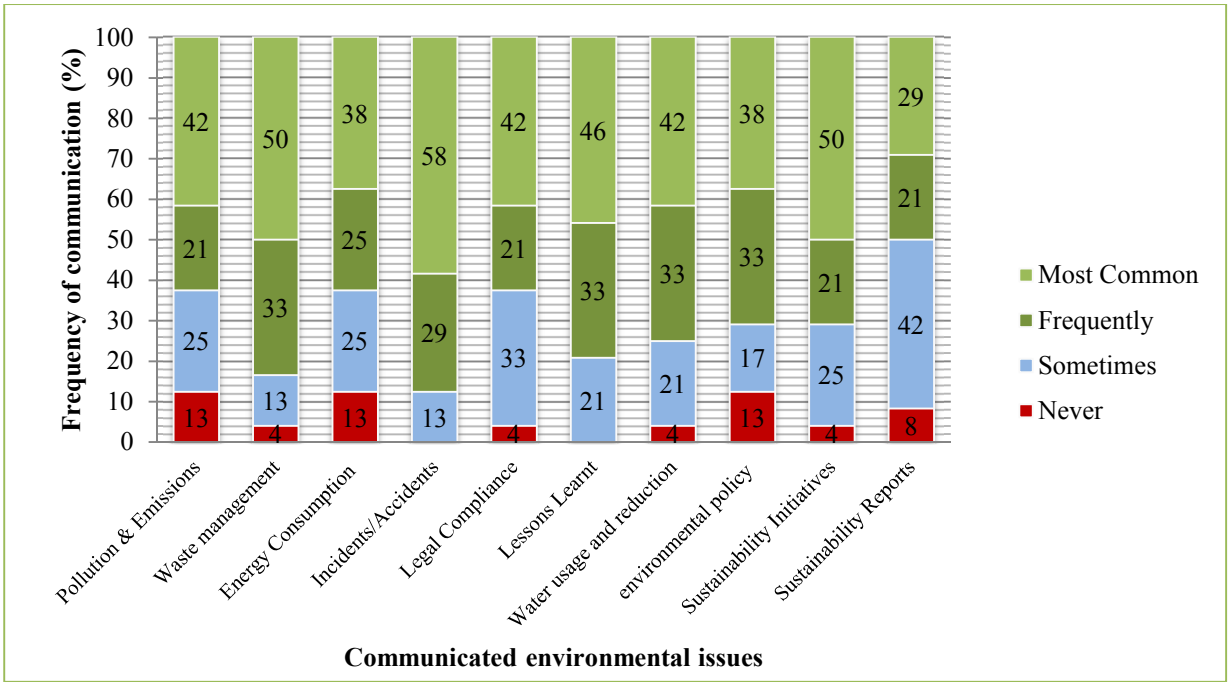


Figure 5.21: Business Respondents: frequency of communicated environmental issues (n=24)

Figure 5.21 presents environmental issues and their frequency of communication in the ISO 14001 companies sampled. Over 50 % of business respondents indicated information on incidents and accidents, sustainability initiatives and waste management issues as commonly communicated. Sustainability Reports are indicated least commonly communicated information by 29% of respondents. However, a low thirteen percent (13%) consistently indicated that environmental policy, energy efficiency and pollution & emissions are never communicated.

Figure 5.22 shows the environmental trainees responses regarding environmental communication. It is apparent that environmental information is shared frequently but not as commonly as reported by the Business Respondents. This is indicated by the higher percentages for 'frequently' (but not commonly) communicated issues such as energy consumption (47%), water usage (40%) and incidents and accidents (40%). However, the most 'commonly' communicated issues consistently confirmed by 33% of respondents are waste management, incidents and accidents, legal compliance, water usage and reduction, and environmental policy. The environmental trainees confirm higher percentages (than the Business Respondents) for lack of communication on sustainability reports (27%) and pollution and emissions information (27%).

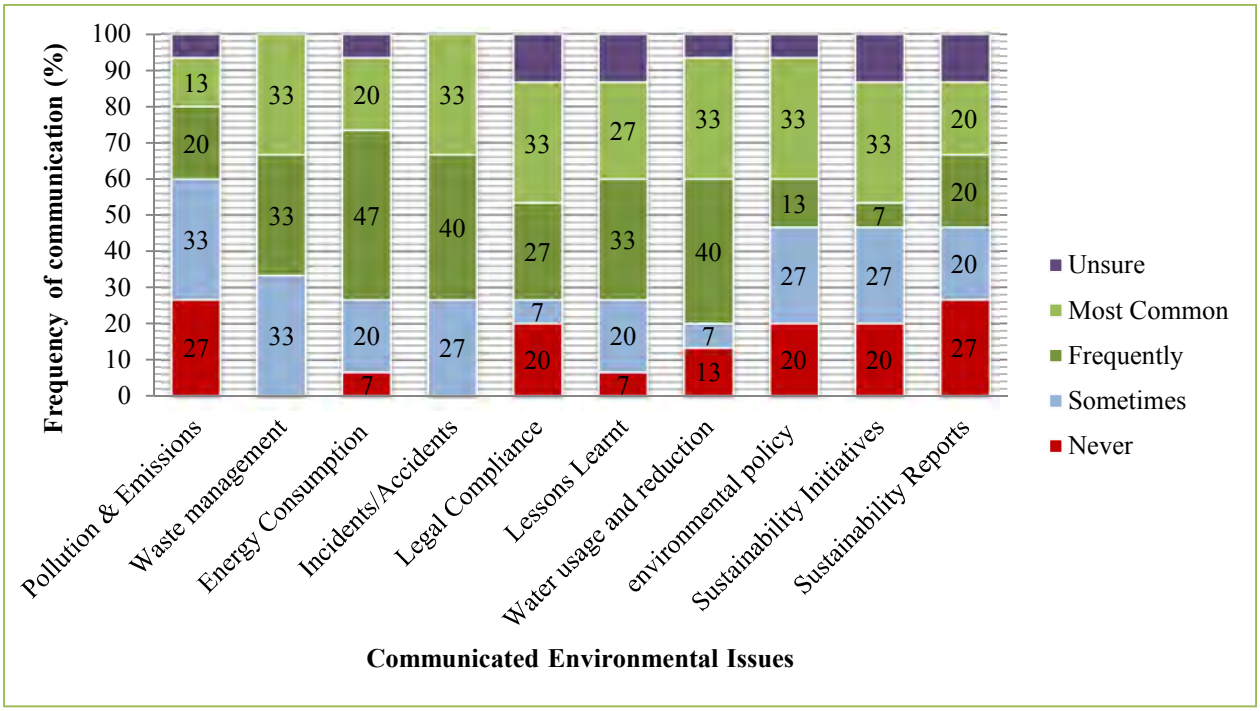


Figure 5.22: Environmental Trainees: Frequency of Communicated Environmental Issues (n=15)

5.7.1 Communication of Environmental legislation

Environmental legal liability evolves with changing environmental legislation, and company leadership carries a significant responsibility for legal environmental compliance in their companies as discussed in Chapter 2 and 3. Table 5.16 shows 71% of business respondents agree that the leadership of their companies are communicated regularly with legal updates and refresher legal training. However, 25% of business respondents disagreed with this indicating a substantial number of business executives in this sample are not kept abreast of environmental legislation. In addition the method of communication of updates was enquired and electronic subscription services was agreed by 83% of business respondents as most frequently used to keep abreast of environmental legislation.

Table 5.16: Business Respondents: Refresher and update courses of environmental legislation (n=24)

	Yes (%)	No (%)	Not aware of any (%)	*Total*
Are refresher and update courses of environmental legislation to management and executives	71	25	4	100
Are electronic subscriptions services available to company employees to receive updates on changes in environmental regulations and laws that affect specific business functions	83	4	13	100

In further assessing the methods of electronic subscription services used for accessing current environmental information, business respondents offered multiple open-ended responses and these are summarised in Table 5.17. There are a variety of electronic information sources for environmental information and legal updates. The use of subscription-based online legal registers and databases are most frequently stated by 39% of respondents. Environmental Information accessed through external environmental specialists is also commonly cited by 29% of respondents. Industry associations also play an important role in disseminating environmental information as indicated by 21% of respondents. Internal legal databases is least cited by 11% of respondents. It is apparent that environmental legal information is prioritised in this sample of Durban Businesses, with the electronic media as an important means to accessing environmental information from various sources external to the company's internal legal databases.

Table 5.17: Business Respondents: Description of the types of electronic subscription services used (n=24)

Description of the types of electronic subscription services used (summary of multiple responses) (n=24)	*Frequency of use (%)*
Internal Legal Department Databases	11
External Legal Consultants and Environmental Specialists	29
Industry Association emails	21
Online Legal Register and Database	39
Total	100

One of the questionnaire responses from the DCCI Environmental Forum Respondent affirms that it plays an important role among Durban businesses in disseminating and communicating relevant environmental information. The DCCI Respondent stated the following regarding its

role, “Actively promotes best environmental practices through information sharing sessions; to give companies/ industry and individuals updates on environmental legislation to assist in their compliance.” This is similarly identified by 21% of business respondents in Table 5.17.

5.7.3 Other or non-electronic methods of communication

While electronic dissemination of environmental information might be frequently used and prioritised more towards senior levels of staff, it was considered important to understand how environmental information is communicated through other means. Table 5.18 shows the methods of internal-company environmental communication. The most commonly used methods of environmental communication are posters and notice-boards agreed by both 36% of business respondents and 33% of environmental trainees. Business-specific magazines were least (16%) used by business respondents while newsletters (17%) were least used by environmental trainees. However, the use of the company website to access environmental information was slightly more commonly used by 25% environmental trainees than stated by 22 % of Business respondents.

Table 5.18: Frequently to commonly used methods of communication

	Business (n=24)	Environmental Trainees (n=15)
Posters/ Notice Board	36	33
Newsletters	26	17
Website	22	25
Magazines	16	25
Total	100	100

In addition 33% (or 8) of the business respondents provided additional open-ended responses commenting on ‘other’ commonly used methods of environmental communication. Most commonly mentioned were weekly talks and meetings. Three of the respondents characterised this as weekly ‘toolbox talks’, “team talks’ and ‘SHE committee meetings’. Sammalisto and Brorson (2008: 306), for example confirms a similar finding that, “Informal training and information can also be provided during regular meetings.” In addition to weekly meetings, the most commonly cited method of communication, by an additional 3 respondents, were the use of EMS databases through the company’s intranet services. The latter shows the consistent reliance on electronic sources. Interestingly, one (1) respondent mentioned the use of environmental events or ‘campaigns’ to communicate environmental information. And lastly

one respondent mentioned the use of "documented environmental internal procedures". This is a likely source for environmental information as it is the primary basis of EMS communication stipulated in ISO 14001 standards. Documentation of all updated, readily available and relevant environmental information is a prioritised means of communication as part of the ISO 14001 EMS (2004:6).

5.7.4 Communication of Environmental Policy to Contracting Staff and Clients

The communication of the environmental policy to external parties such as clients and contractors is shown in Table 5.16. The business respondents show a high response of 96% confirming that the environmental policy is communicated to their clients and contractors. The environmental trainees showed some lack of knowledge regarding this as confirmed by 27 % of responses that were unsure, however, 67 % confirmed that contractors and clients are made aware of the company's environmental policy. The high level of environmental policy communication by the business respondents is also further substantiated through an open-ended question on how this is communicated to the clients and contractors. This is also shown in Table 5.19.

Table 5.19: Communication of the environmental policy to contractors and clients

Communication of the environmental policy to contractors and clients				
	Yes	No	Unsure	*Total*
Business (n=24)	96	4	-	100
Environmental Trainees (n=15)	67	7	27	100

Business Respondents: How the environmental policy is communicated to clients and contractors(summary of multiple responses)	Frequency of Responses (%)
During SHE induction	50
Through Email/website	17
Stipulated in Contract documentation	25
Physically displayed on notice boards	8
Total	100

The business respondents confirmed communication of their environmental policy with contractors and clients, and 50% said this was done through SHE induction training. Considering that this may not be the most convenient arrangement for clients and contractors a further 25% confirmed that the environmental policy is communicated in the contractual documentation. The use of electronic media is again a convenient method of communication as confirmed by 17% of respondents while 8% of business respondents said that the

environmental policy is prominently and visibly displayed on notice boards. In terms of the stipulated requirement of the ISO 14001 EMS the communication of the environmental policy as presented by the Business Respondents, is likely to be effectively achieved considering the wide range of communication methods used.

5.7.5 Access to Environmental Information

Furthermore, an overall picture of the accessibility to environmental information internal and external to the Durban businesses sampled is presented in Figure5.23. Access to relevant environmental information through internally communicated information as well as information available external to the company was assessed. The respondents show that environmental information is generally more easily accessible from internal company sources than from external sources. However, business respondents (92%) found it easier to access internal information than the Environmental Trainee sample (67%). Predominantly 40% environmental trainees indicated poor access to environmental information compared to 13%of the Business Respondents. It is apparent that below management level employees have less access to internal and external environmental information. In addition, based on Table 5.21 findings, it is apparent that business respondents experience greater communication of environmental issues, which correlates with the findings shown in Figure 5.23that business respondents have greater access to internal environmental information than the environmental trainees in this sample of Durban Businesses.

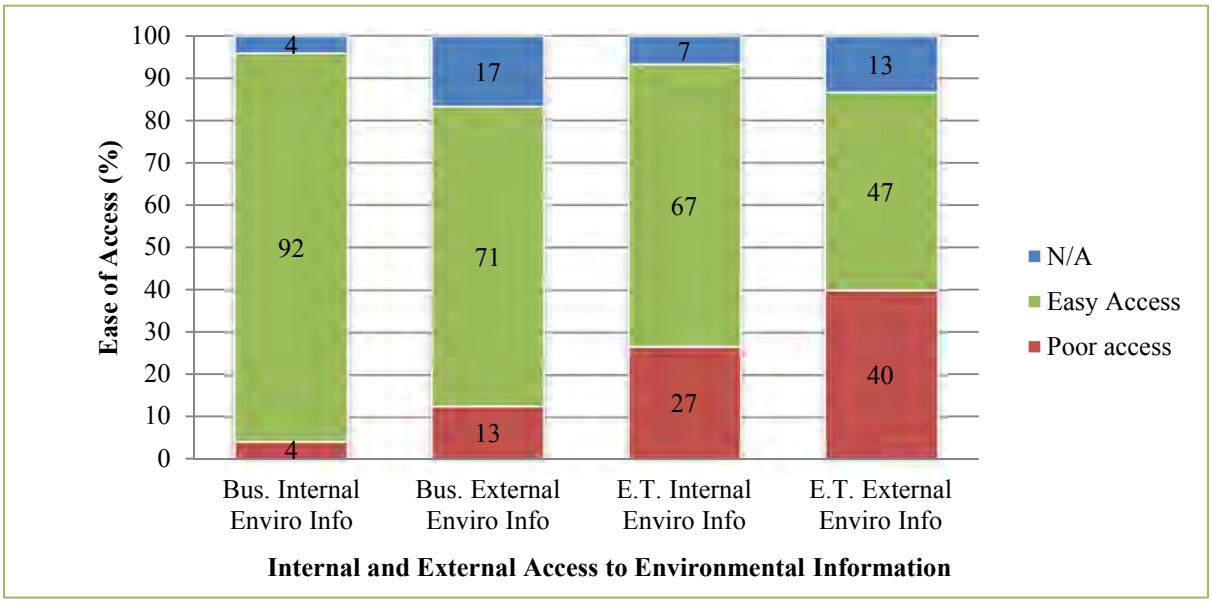


Figure 5.23: Internal and external access to environmental information of business (Bus) and environmental trainees (ET) respondents

5.8 Satisfaction Levels, Benefits and Impediments of Environmental Training

5.8.1 Satisfaction with Environmental Training

Figure5.24 shows both the business respondents and Environmental Trainees' level of satisfaction with the environmental training received. The 37 % of business respondents shows a higher level of satisfaction with their environmental training than the 20 % of Environmental Trainees. Similarly, although a low response frequency, 13% of business respondents are very satisfied with their environmental training compared to 7% of Environmental Trainees. While none of the business respondents are dissatisfied with their environmental training, 13% of environmental trainees present dissatisfaction.

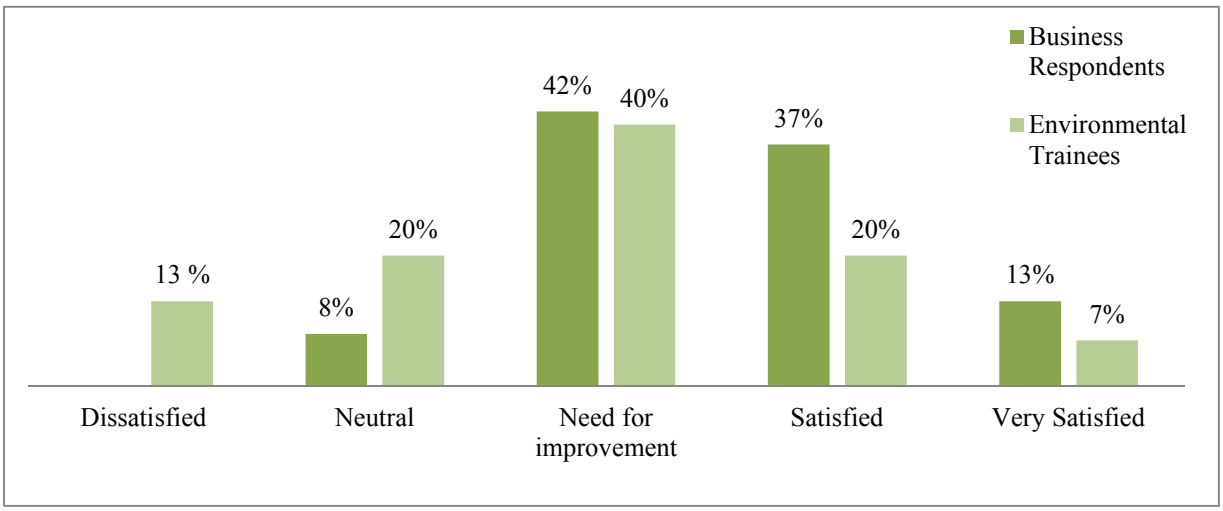


Figure 5.24: Level of satisfaction with environmental training of business (n=24) and environmental trainee (n=15) respondents

The satisfaction with environmental training is exceeded by the need for improvement. The need for improvement in environmental training is consistently and similarly high for both business respondents (42%) and environmental trainees (40%). Furthermore the Environmental trainees show a greater tendency for neutrality on this issue than business respondents which suggest that the business respondents have acquired a greater awareness of the value of environmental training than the Environmental Trainees. Furthermore, the ISO 10015 Training Standards stipulates and emphasises the importance of training evaluation to include the satisfaction level of training received (ISO 1999:6). A regular evaluation practice can ensure greater relevance and improvement needs in the ETA practices.

5.8.2 Benefits of Environmental Training

There are various benefits to environmental training in creating an organisational culture and attitude conducive to environmental change and adaptability which can bring increased environmental performance and reduced environmental impacts. These benefits are shown in greater detail in Figure5.25 to which respondents were asked to rate the level to which they agreed to the implementation of these benefits in their specific business contexts. Table 5.20 shows the collated responses regarding the benefits of environmental training as indicated by all of the respondents.

Table 5.20: All Respondents: Collated responses to the benefits of environmental training

	DCCI	Trainer 1	Trainer 2	SDCEA	SEDA	Environmental Trainees	Business Respondents
Neutral	0	0	0	0	0	28	9
Agree	38	100	46	100	100	55	47
Strongly Agree	62	0	54	0	0	5	39
Disagree/Strongly Disagree	0	0	0	0	0	12	5
Total	100	100	100	100	100	100	100

The business respondents predominantly agree to the implementation of these environmental training benefits as shown by the 47% agreement. In Figure 5.25, most frequently 58% of business respondents agreed that the main benefit of environmental training is "Changing Staff Attitudes towards Environmentally-sound Business Practices".

Over 50% of business respondents frequently agreed to the following benefits: Increasing staff competency that effect sound environmental considerations in business decisions; improved compliance to legal and industry standards; ensuring company governance commitment; and improved production efficiency. Reducing environmental impact was most strongly agreed to by 46% of business respondents and interestingly as equally strongly agreed to as 'adhering to group environmental requirements' and improving the effectiveness of company EMS. Business respondents least frequently agreed (38%) to the role of environmental training in enhancing business competitiveness.

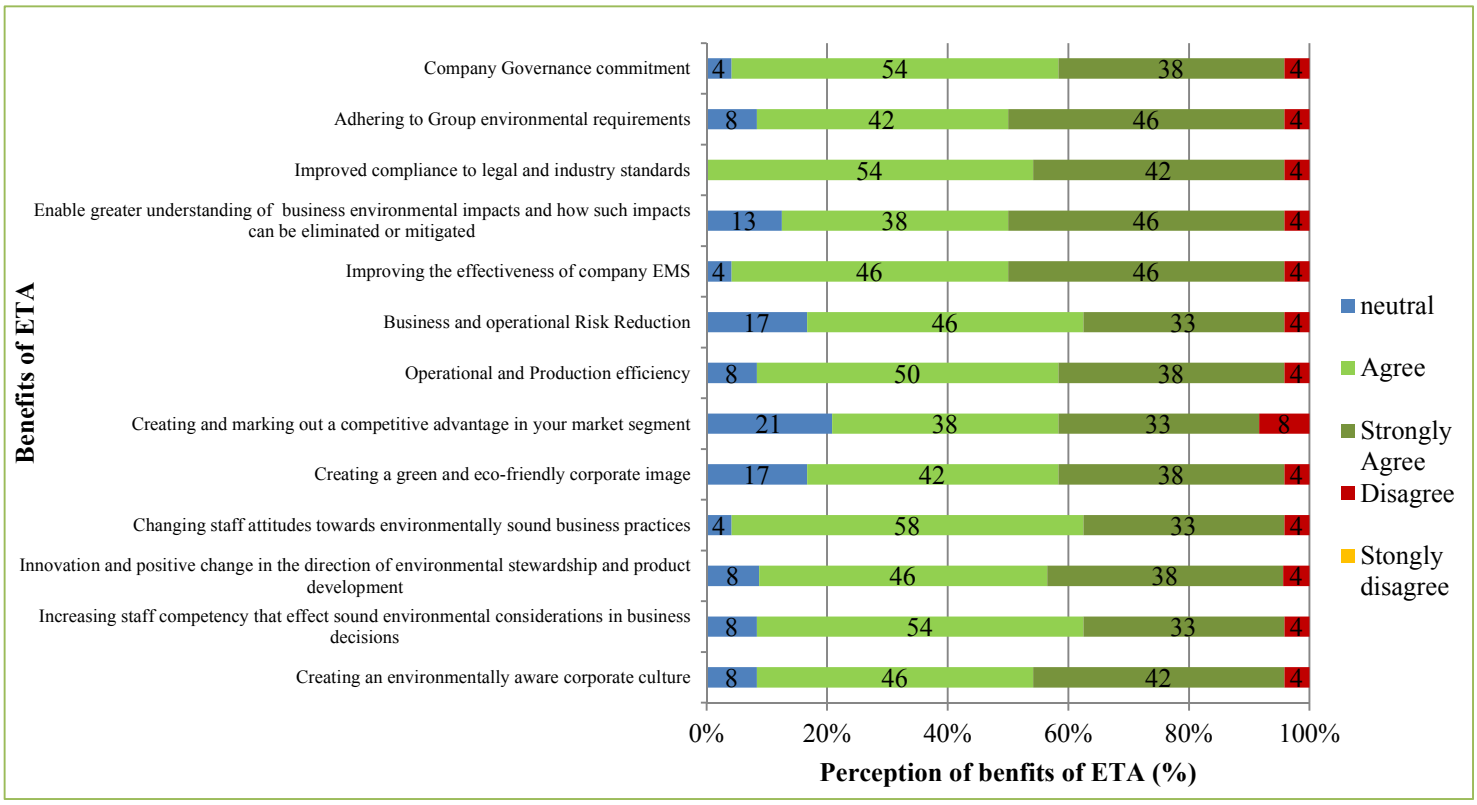


Figure 5.25: Business Respondents: Benefits of environmental training (n=24)

The environmental trainees show stronger agreement to the benefits of environmental training and its implementation in their business contexts as seen in Table 5.20 showing an overall 55% agreement. Comparatively, however business respondents more frequently 'strongly agree' to these benefits as shown in Table 5.20. As shown in Figure 5.26, over 67% of environmental trainees agree that environmental training benefits their businesses by 'Increasing staff competency that effect sound environmental considerations in business decisions'.

Additionally over 60% of environmental trainees consider the following as implementable benefits: Adhering to group requirements; improved compliance to legal and industry standards; creating and marking out a competitive advantage in your market segment; and creating an environmentally aware corporate culture. Environmental trainees least frequently agreed (47%) to the 'company governance commitment' and 'innovation and positive change in the direction of environmental stewardship and product development' as benefits of environmental training. Additionally 29% of environmental trainees presented neutral responses more frequently than the 9% of business respondents suggesting less awareness of the value of the benefits of environmental training in their business contexts. Tung *et al.*

(2014), for example, asserts that there are many organisational benefits of environmental training but most importantly is the reduction of environmental impacts.

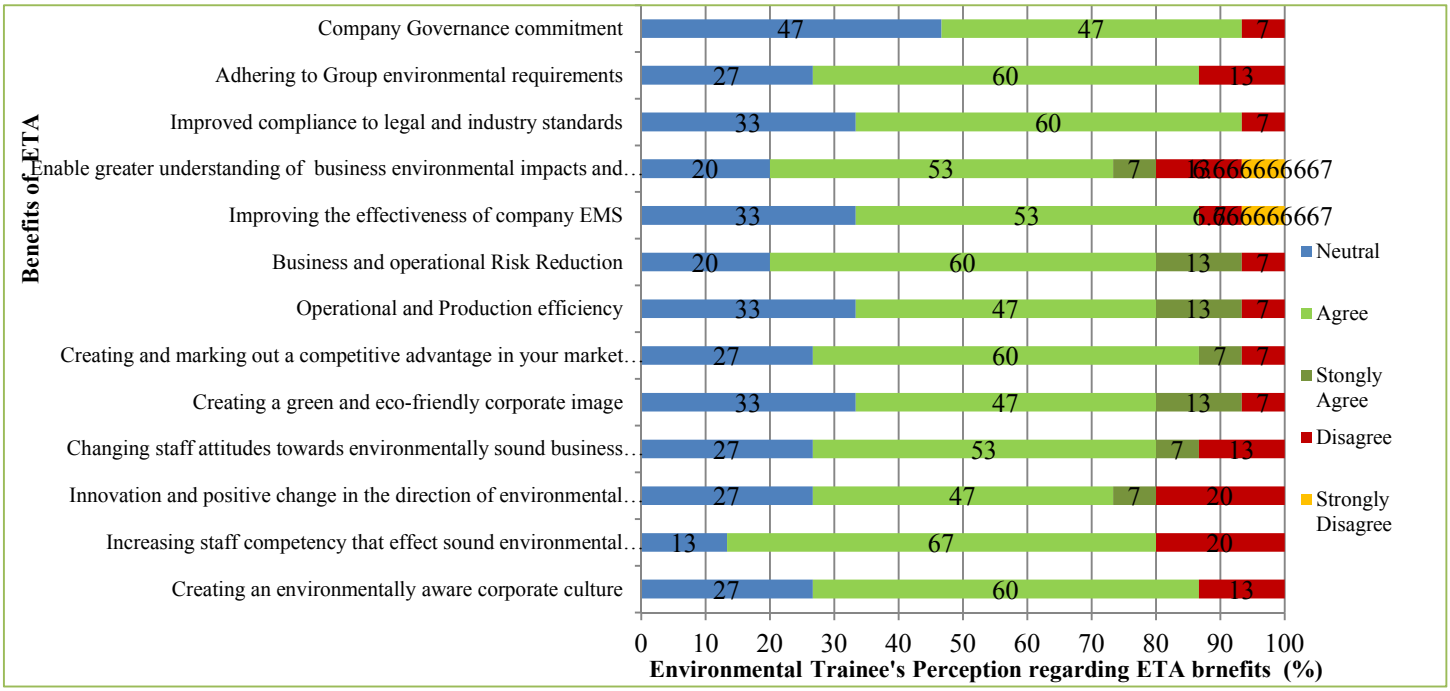


Figure 5.26: Environmental trainees perceptions of the benefits of environmental training (%)(n=15)

5.8.3 Impediments to Effective Environmental Training

In addition to the benefits of environmental training, impediments to environmental training have also been identified. The impediments queried include broadly management commitment and organisational cultures as well as the practicalities of cost, time and expertise in conducting environmental training. The impediments to training though not exhaustive, will give an indication of the potential for improvement of ETA practices among the sampled Durban Businesses.

Table 5.21 shows the collated responses to the 'Impediments to Environmental Training' reported by the business and environmental trainee respondents. The environmental trainees show they mostly agree to the various impediments to environmental training however the business respondents on the contrary, disagree more frequently to the various possible impediments to environmental training. The Figures 5.27, 5.28 and 5.29 detail the unit responses of the business, environmental trainees and other respondents.

Table 5.21: Overall responses to impediments to environmental training (multiple questions)

Impediments to Environmental Training	Environmental Trainees (%)	Business Respondents (%)
No Response	-	1
Agree	57	32
Strongly Agree	17	9
Disagree	23	55
Strongly Disagree	3	4
Total	100	100

Figure 5.27shows the business respondents optimism regarding their environmental training experience as there is a higher frequency of disagreement with the impediment statements than agreement. However, the highest response in agreement was 67 % of business respondents to the impediment statement 'requires expert knowledge'. 'High costs' also received a frequent 42% agreement while having the highest frequency of strong agreement by 29% of business respondents. 'Difficulty in evaluating the outcomes' was similarly agreed to by 42% of business respondents. These impediments are similarly identified byVidal-Salazar *et al.* (2012), underscoring the role of training evaluation which increases the value perception of environmental training by managers, thereby allowing them to invest in environmental training more readily and confidently.

The least frequent responses by 8% of the business respondents agreed the statement 'too technical to understand' with 4% strong agreement. The same statement has however received the highest disagreement response of 83%.The high baseline environmental knowledge and tertiary level of education of the business respondent sample perhaps offers an explanation for this high rate of disagreement. These responses indicate a positive attitude towards learning new and likely unfamiliar environmental information.

However, the environmental trainees are less optimistic about their environmental training experience as shown by 57% that have predominantly agreed that there are a number of impediments to effective environmental training in their business contexts. As shown in Figure 5.28, the most frequently reported impediment is 'high costs' as responded by 80% of the Environmental Trainees. Next most frequently considered impediments were 73% respectively agreeing to "poor management commitment" and "unclear environmental training criteria and standards'. Additionally 60% respectively agreed that a 'lack in organisational culture' and 'time consuming' were further impediments to effective environmental training. The

environmental training impediment receiving the least agreement was "too technical to understand" and "requires expert knowledge". The highest disagreement (40%) was to the statement "too technical to understand".

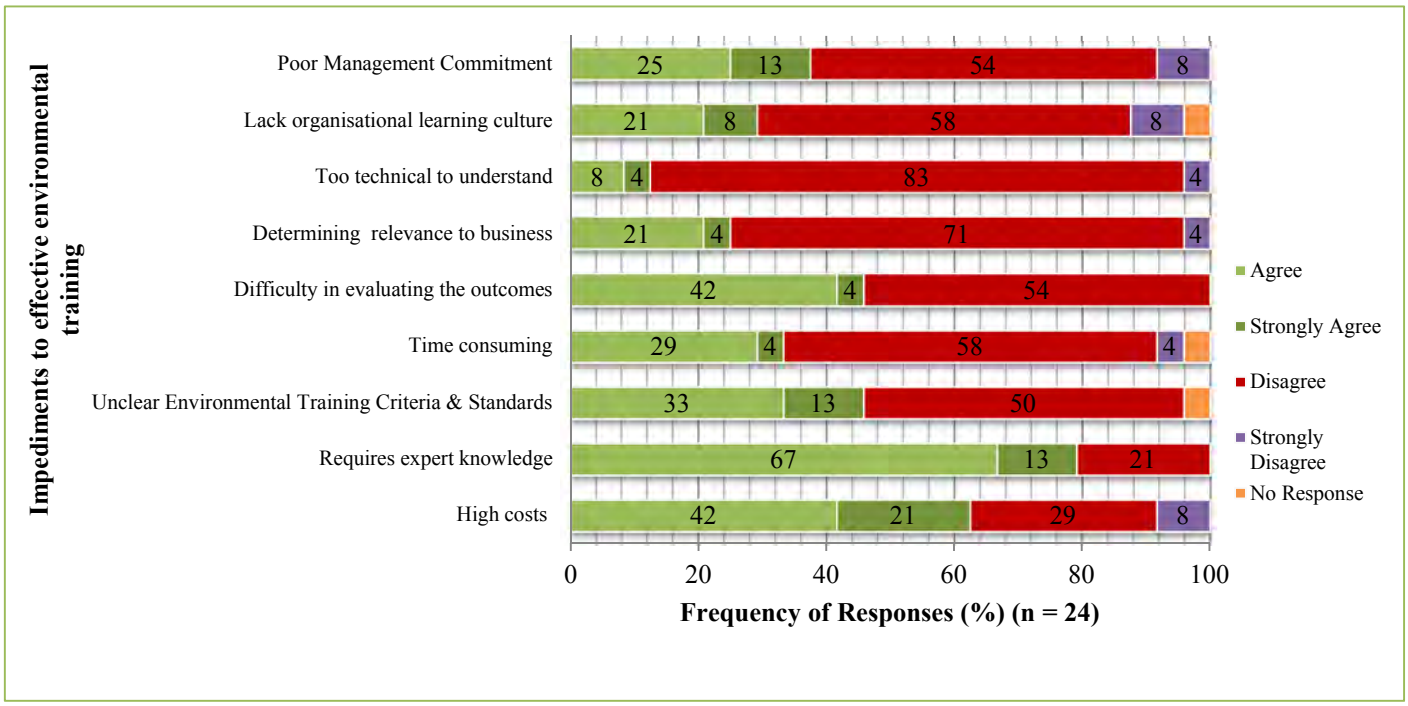


Figure 5.27: Business Respondents: Responses to impediments to environmental training

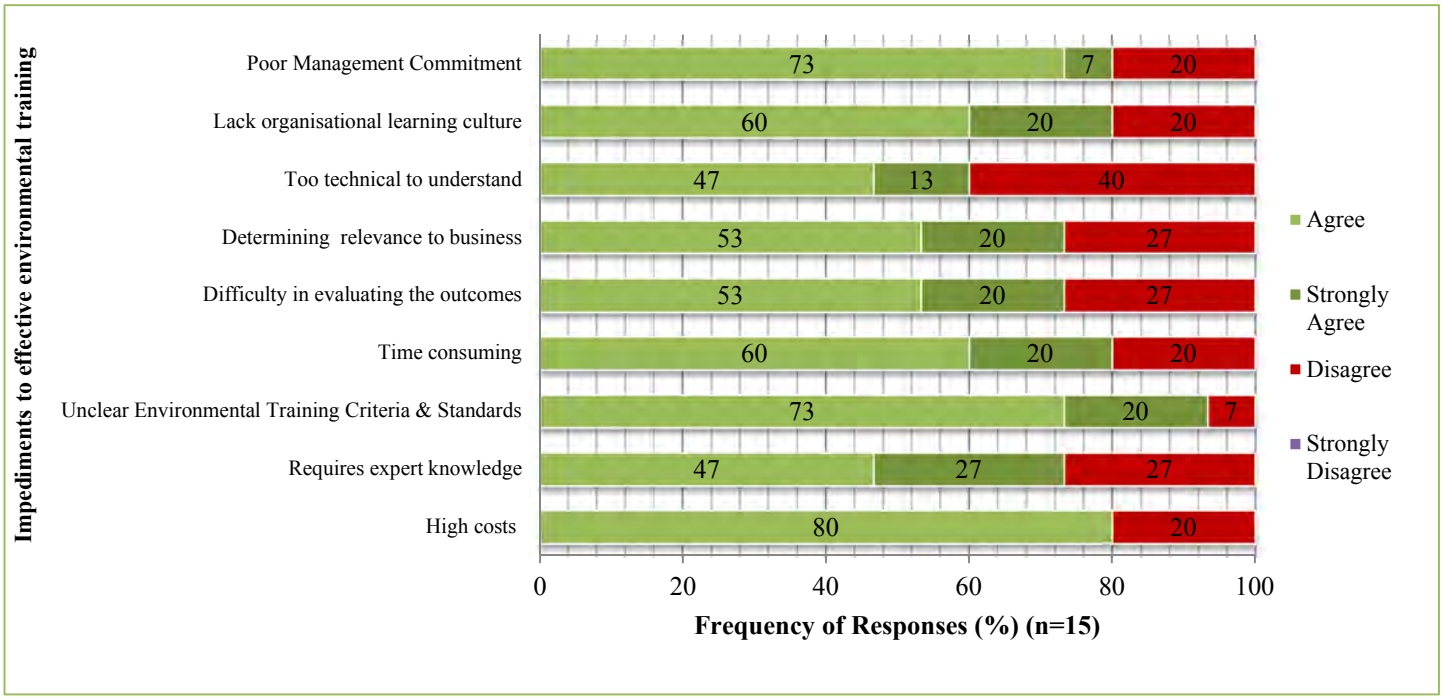


Figure 5.28: Environmental Trainees: Responses to impediments to environmental training

The other respondents as shown in Figure 5.29 also provide their perspectives on the possible impediments to effective environmental training among Durban businesses. There is an overall less optimistic perspective provided by these Respondents showing predominantly that there are problems to be overcome regarding effective environmental training.

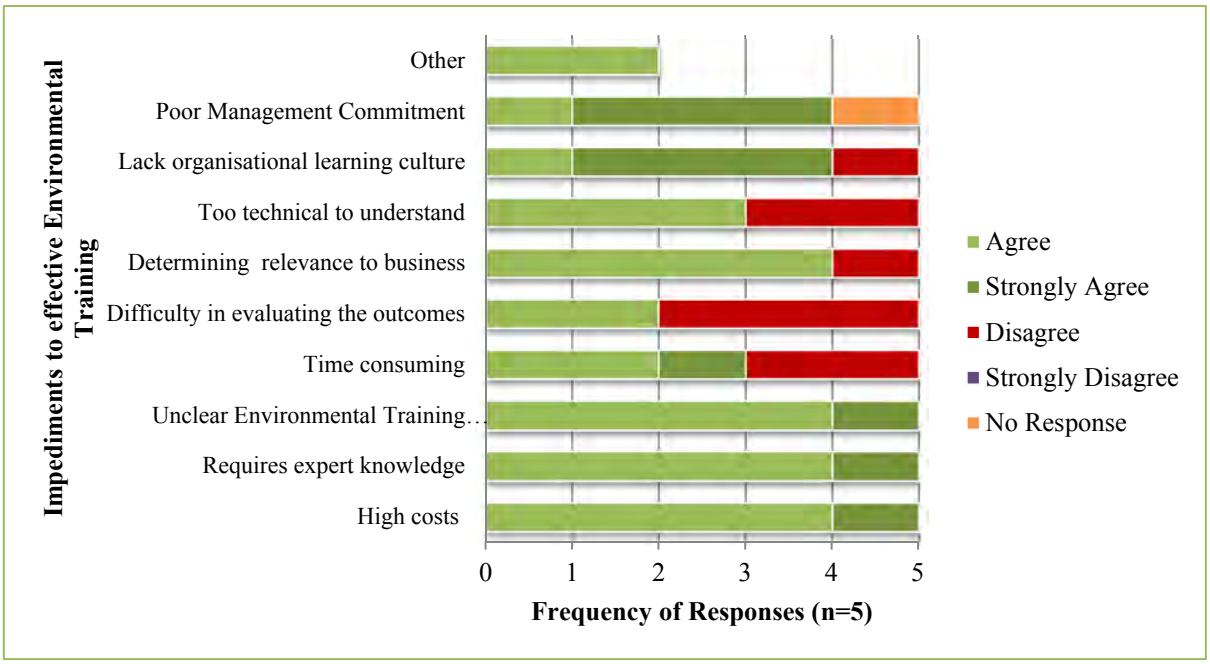


Figure 5.29: Other Respondents: Responses to impediments to environmental training (n=5)

There is unanimous agreement (Frequency, 5) on the following as impediments to environmental training: 'Unclear environmental training criteria and training standards'; 'requires expert knowledge'; and 'high costs'. Next most frequently, four (4) of the respondents agree that 'determining relevance to business' is one of the problems encountered. Additionally, the strongest agreement was indicated by 3 Respondents as 'lack of organisational learning culture' and 'poor management commitment'. Three (3) respondents most frequently disagreed with the assertion that there is "difficulty in evaluating the outcomes" of environmental training.

Regarding evaluation of environmental training, both the Training Providers commented that evaluation is only sometimes required in the environmental training they conduct. Both respondents agreed that they often conduct evaluation of training but only during environmental impact related courses particularly of hazard identification and risk assessment courses. The evaluation method makes use of practical's, tests and group activities. However it is apparent that evaluation of environmental training is not frequently conducted and this correlates with the business respondents identifying it is a possible impediment.

Figure 5.29 also shows 2 Respondents provided additional or other comments on the impediments to environmental training. One respondent added that there is an insufficient awareness of the value of the natural environmental among business employees. Similarly another respondent further criticised the lack of management leadership in environmental training as follows, "Management lack the care and dedication to assist in environmental programmes due to lack of knowledge and understanding of the importance of the environment."

The role of management commitment for effective ETA has been established in this study. However it is evident from the 5 Respondents that management commitment if effectively fostered can lead to addressing some of the other impediments identified. For example, Blackburn (2008), advocates that managers should be accountable for their environmental performance through performance reviews stipulated in employment contracts. In this way perhaps greater management involvement and commitment can be motivated.

While 'high costs' remain an impediment, increasing management commitment can address this through understanding and commitment to the value of ETA in the workplace.Vidal-Salazar *et al.* (2012), for example acknowledges that high costs are unavoidable, but motivated managers can allocate required funds with greater confidence when the evaluated outcomes of ETA are clear. Additionally the impediment of 'requiring expert knowledge' and 'lack of training standards' are considered by other researchers as increasing procurement costs of training experts as this cannot be provided by in-house company personnel(Unnikrishnan and Hedge, 2007; Sammalisto and Brorson, 2008).The changing nature of environmental legislation for example as discussed in Chapter 3, can also present a challenge as legal experts have to also be additionally consulted for training if such need arises. However, Lesourd and Schilizzi (2001) recognises the financial expediency of using trained expertise of in-house permanent staff, however this may not always be a viable option when specific environmental expertise is required. Furthermore changing regulations also can present a challenge in making ETA relevant and as one researcher identified that training should be kept focused and relevant and to avoid "indirect environmental aspects" (Sammalisto and Brorson, 2008 : 306). The 'lack of training standards' is indicated further by the Respondents as an impediment to ETA which as discussed in Chapter 3, the DEA has recognised that greater institutional effort is required to develop relevant NQF rated environmental training standards for business relevance(DEA, 2009b; DEA, 2010a).

5.8.3 Need for Inter-Industry Collaboration and Environmental Training Standards

Industry associations have emerged as a frequently used platform for information sharing, however the extent to which further industry collaboration is needed for the purposes of environmental training is enquired. Table5.22 shows that all the respondents are mostly in agreement with the need for inter-industry collaboration on environmental training best practice. Over 80% of business respondents identified a need for further collaboration with other businesses regarding environmental training. The environmental trainees less frequently but predominantly agreed (60%) while 40% did not think this was needed. The other respondents unanimously agreed to further industry collaboration on environmental training.

Table 5.22: All Respondents: The need for inter-industry collaboration

Is there a need for inter-industry collaboration on environmental training best practice?	Yes (%)	No (%)
Business (n=24)	88	12
Environmental Trainees (n=15)	60	40
Other Respondents (n=5)	100	0

Furthermore Table 5.23shows the business respondents open-ended responses to what they perceived were the benefits of inter-industry collaboration in environmental training. Seventy-nine percent (79%) of business respondents offered an explanation of their agreement to inter-industry collaboration. Each respondent detailed multiple benefits and these have been summarised and tabulated as shown in Table 5.23. Most frequently in 31% of responses the opportunity to learn about environmental training best practice was cited. This shows a wide acceptance of the importance of industry-information sharing. One respondent said the following: “It is possible that environmental aspects differ from company to company. It is also important to learn from others how significant aspects have been reduced. It is also interesting to find out how employees could take their environmental learning from the workplace and apply it in their homes and in their neighbourhoods.”

There were 16% of responses that cited the reduction of environmental impacts as an important benefit. Reducing waste and recycling products as well as greening the supply chain of raw materials was some of the cited possible impact reduction outcomes of such collaboration. One respondent said the following: “Companies invest heavily intensely on environmental

programs to ensure sustainable development. This will help in minimising their impact on the environment and reduce costs."

A further 16% of responses confirmed that industry associations are currently providing this platform for information sharing. The examples that were cited include the Durban Chamber of Commerce and Industry (DCCI) and the Durban Chemical Cluster, offering industry-collaboration that is informing some of their environmental training activities.

The benefit of increasing environmental regulatory compliance was cited by 16% of responses. Equally frequent were the benefits to increased management involvement and learning culture that can further benefit environmental performance. One of the respondents said the following in this regard, "This will help to mainstream environmental priorities across the company including getting management involved."

Table 5.23: Business Respondents: Summary of 19 open-ended comments on the benefits of inter-industry coordination (n=24).

Explanation of how inter-industry coordination can assist environmental training topics and practices (multiple responses)	Frequency of responses (%)
Increase company performance and management involvement	16
Provided currently through Industry Associations	16
Assist in environmental impact reduction	16
It's an important opportunity to share and learn environmental training best practice	31
Can assist in lobbying against government legislation	5
Will help increase environmental compliance	16
Total	100

Further it was enquired of the other respondents who are relevantly positioned within the Durban business context to understand these needs, if there was indeed a need for further specific environmental training standards for Durban. Table 5.24 shows that 3 respondents (60%) affirmed there is a need while two of the other respondents disagreed.

Table 5.24: Other Respondents: Need for environmental training standards (n=5)

Is there a need for environmental training standards for businesses in Durban?	Yes	No	N/A	*Total*
	3	1	1	5

Two of the respondents said the following regarding the need for training standards in Durban**,** "Need structured guide as to what should be covered, what is critical and what is relevant." While another respondent added that, "There is a lack of information. We need more information on standards". A further respondent commented on Durban businesses saying: "Believe little is being done by Durban businesses, it is costly and costs determine only doing what is needed". However, one respondent disagreed with the need for further environmental training standards commented the following, "Training standards are sufficient in Durban however there is no culture of learning from top management."

Unnikrishnan and Hedge (2007), for example, have highlighted that industry associations can be useful sources of environmental information. In addition these external networking arrangements are encouraged as communities of practice are encouraged as part of connecting knowledge seekers with knowledge owners (Baird and Henderson, 2001).The comments from the respondents present an overall need for further environmental training standards and inter-industry collaboration in establishing environmental training best practice.

5.9 CONCLUSION

This chapter has presented, analysed and discussed the various responses of the Business, Environmental Trainees, and other respondents in terms of their perceptions and attitudes regarding environmental training, their specific environmental training practices, communication of environmental issues, training topic coverage and resources committed. In addition, the impediments to effective environmental training were assessed.

There is an overall a positive perception of environmental training in Durban's businesses. There is a tendency to focus on environmental impact training however there is also a tendency to combine environmental training with other Safety and Health training priorities. There are further training needs identified by the respondents in addition to inter-industry collaboration on environmental training. This is complemented by the possible need for specific environmental training standards and inter-industry collaboration. The high costs of environmental training, combined with difficulty in evaluating environmental training and securing management commitment remains key impediments to effective environmental training.

CHAPTER 6: SUMMARY, RECOMMENDATIONS AND CONCLUSION

6.1 INTRODUCTION

The aim of this study is to review the environmental training practices of selected businesses in Durban. This chapter provides summative presentation of the key findings. These are presented under five major objective points in order to integrate the findings with the initial objectives of this study. Furthermore the assessment of the findings is provided in relation to the developed 7 environmental training principles. The relevant findings elucidate recommendations that can address improving environmental training and awareness activities among the selected businesses in Durban in a broader organisational and institutional context.

6.2 SUMMARY OF KEY FINDINGS

1. **Objective: To investigate the extent of environmental training and awareness (ETA) within Durban businesses**

   The extent of ETA within the selected Durban Businesses presents the baseline environmental awareness of the respondents. It further presents how ETA is prioritised in terms of frequency of training, training topics covered and further training needs revealed from the collated data.

   The baseline environmental awareness and knowledge of the business respondents and environmental trainees are good as shown by 84% and 74% respectively, of correct responses to environmental knowledge questions. In addition most of the business respondents understood the role of ISO 14001 EMS in reducing environmental impacts and also indicated greater knowledge of their companies 'environmental policy than did the Environmental Trainees. The ISO 14001 business respondents comprised mostly of degree-qualified managers while the Environmental trainees were mostly high school-qualified SHE and SHEQ administrators.

   The respondents in this study predominantly are representative of manufacturing, petrochemical and industrial business services types with employee numbers predominantly between 30 to 250 employees. The Durban businesses represented by the respondents were all ISO 14001 certified with the exception of 40% of the

businesses from the Environmental Trainee sample. The ISO 14001 Durban Businesses prioritise environmental management and training competencies predominantly within the SHE and SHEQ occupational roles. Maximising human resources to conduct environmental training is apparent as most environmental training is conducted by in-house training staff as confirmed by 79% of business respondents and similarly agreed by the environmental trainees. Furthermore in-house environmental managers are reported to frequently conduct environmental training while externally; local training consultants are frequently used.

Over 80% of the business respondents agree that environmental training is a priority in their businesses. There is a high level of commitment to training indicated however the training frequency indicated by 50 % of business respondents confirm predominantly1 to 2 ETA courses are undertaken annually, which is similarly confirmed by the environmental trainees. ETA is commonly integrated with other training activities as predominantly confirmed by 24% and 29% respectively of business respondents as part of SHEQ training and company induction training. This is similarly agreed by environmental trainees. Confirmed by most respondents, ETA courses are rarely undertaken as separate courses.

The focus of environmental training courses in this sample of Durban businesses show a particularly high focus on waste management as confirmed by 100% of Business Respondents. Other frequently reported training topics by 95% of business respondents include hazardous chemicals and general environmental awareness. In addition, the following training topics are also indicated as frequently undertaken by the business respondents:

- Energy Efficiency,
- Accident/Spillage,
- Water Use and Conservation and ,
- Environmental Legal Liability and Risk Management.

Further to this, the business respondents and environmental trainees frequently indicated the need for further environmental training in production and manufacturing eco-efficiency. Furthermore, 53% of environmental trainees, most frequently indicated

a need for further training in SHE induction courses and environmental legal liability and risk management.

The environmental training competencies are consistently within the SHE and SHEQ occupational designations which show that ETA activities are being assimilated as part of other Safety and Health priorities in the Durban businesses sampled. The extent of ETA in the selected businesses is broadly accomplished through focused environmental impact-specific training predominantly in waste management. ETA is mostly integrated with other SHEQ training but does not appear to hinder relevant environmental impact-focused training topics in the ETA activities as reported by the respondents. The indicated frequency of training is predominantly 1 to 2 courses per annum as shown by 50 % of business respondents and 53 % of environmental trainees. However non-attendance of environmental training is highest for the Environmental Trainee sample of 27% while 17% of business respondents admittedly don't attend any environmental courses. There is therefore room for improvement in attendance but it is does show a positive trend by the sampled business respondents.

Objective 2: Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.

Effective training is ideally a company-wide activity and more than an activity is should be embraced in an organisational culture of learning. This is often best indicated by the how widespread the environmental training reach is within a company.

Duration of training per annum is identified as predominantly less 80hr/a across the various tiers of company structures. Regarding the duration of environmental training per annum, factory workers, temporary workers and officer workers are most frequently cited by 67% of Business Respondents, to attend less than 80hr/a of Environmental training. For the same duration of training, business executives such as CEOs, directors and CFOs attend the least amount of training as cited by fewer than 10% of Business Respondents. Contractors attend less than 80hr/a of training more frequently (54%) than supervisors (50%) and senior managers (50%). However, junior managers are reported to attend less than 80hr/a, more frequently (58%) than senior managers. Training for over 80 hr/a are equally attended by business executives, factory, temporary and officer workers. It is interesting to note that the lower tiers of employees

are equally frequently reported to have over 80 hours of training per annum as the executive tiers. The distinct trends indicate that under 80hr/a is the most common duration period for environmental training than over 80 hrs/a across all tiers with the lower company tiers spending a greater duration of time per annum in environmental training than do middle management and business executive tiers.

The most frequently used methods of training are onsite training, workshops, and video training methods. These methods are most frequently used to train factory, temporary and office workers. Online training is used least frequently across all tiers however is most prominently and equally used among the directors, CFOs, and CEOs as shown by 23% frequency for each respectively. Furthermore supervisors, junior managers and senior managers mostly received training via workshops, onsite training and use of company publications. The convenient use of publications and online training tools by business executives indicate that informal training is prioritised over formal training methods.

All tiers of company structures are exposed to environmental training; however the duration of the training is focused predominantly on the lower tiers of company structures such as factory, temporary and office workers. Middle management and business executives spend significantly less time in environmental training. Furthermore informal training methods such on-line training and the use of publications are prioritised for business executives. While onsite training, workshops and video training methods are predominantly used in the other tiers, the lower tiers of employees are most frequently trained with these training methods. This overall indicates that the efficacy of environmental training among the Durban businesses is limited as the duration of training and methods of training are inconsistently undertaken across the various tiers with business executives showing the least exposure to environmental training.

Objective 3: The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation

Over 95% of business respondents consistently showed positive environmentally-conscious attitudes and behaviours in and outside the workplace. Positive

environmentally conscious behaviours were indicated by the over 90% response rate for recycling, use of energy efficient lighting and anti-littering activities. However, the use of car-pooling was agreed by only 59% of respondents. Overall, this indicates a high level of personal values towards the environment. Additionally 79% indicated a tendency to consider environmental issues in business decision-making while 100% of respondents agreed that environmental issues deserve greater prioritisation of company resources and finances.

In terms of embracing an environmental-progressive business culture and green innovation, the Business respondents, who represent a management level perspective, 96% agree that environmental issues present a change to business-as-usual however indicate equally strongly in agreement that their company's leadership is embracing and adapting to this change accordingly. There is also predominant agreement by 96% of business respondents that bottom-up initiatives such as the appointing of environmental champions help to keep environmental issues on their business agenda. Furthermore, the business respondents and Environmental Trainee respondents overall present a positive culture of green innovation in their companies indicated by the 100% agreement to the assertion that environmental training enables green innovation in business. In addition an overall 76% of Business Respondents' responses were in agreement to innovation in technology, taking innovation risks and actively searching for new innovative environmental ideas. Similarly, and more pronounced with an overall 81% of Environmental Trainee responses in agreement to green innovation in their business contexts.

In terms of the Other Respondents, the SDCEA Respondent strongly agrees to environmental management benefits of environmental training among the South Durban industries. The SEDA respondent agree that SMME business owners and employees have shown an interest in environmental training but conceded the interest is limited and environmental management is not prioritised. The DCCI respondent indicated that environmental training is very important to Durban businesses and they are involved in this activity through the Environmental Forum of the DCCI. Additionally, both the Training Providers agreed that environmental training is important for environmental performance in Durban businesses.

These responses therefore indicate a positive perception of environmental training to enable effective environmental management and innovation in the Durban businesses sampled.

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Objective 4: Develop a set of ETA principles to evaluate the ETA practices

ETA is a relatively new addition to the complement of training materials deemed pertinent to corporate performance in the past decade. There is therefore a decidedly significant information gap regarding this particular practice. What therefore becomes expedient is to clarify what might be guiding principles that will elucidate best practice as a benchmark which can be useful to categorising the results of this study.

In Chapter three, the literature review provided the basis for formulating environmental training principles which are shown in Table 6.1.

Table 6.1: Environmental training principles

Environmental Training Principles	
1. Company leadership-driven with management involvement in Environmental Training	2. Keep training relevant and legislatively up to date
3. Commitment of financial and human resources	4. Provides the motivation for environmentally aware and performing business culture
5. Provide regular communication of environmental policy and relevant environmental information for employees	6. Make training available across the entire company including appointed contractors
7. Prioritise environmental training learnerships over short courses	

Principle 1: Environmental training is company leadership-driven with management involvement in environmental training. In Objective 2 and 3 the applicability of this principle has been discussed showing that there is overall agreement by the Durban businesses sampled that company leadership embraces environmental values, has positive environmental attitudes and behaviours. In addition, involvement of in-house environmental managers together with in-house training personnel oversees environmental training in most of the Durban businesses. However the participants present a strong indication that there is greater need of management level participation in environmental training activities across the company structures. The Durban

businesses sampled therefore show sufficient compliance to this principle with a need for improvement in leadership involvement in environmental training activities.

Principle 2: Keep training relevant and legislatively up to date

The relevance of environmental training is indicated by the overall agreement shown by the Respondents to the various topics covered in training they currently receive. This has been discussed in Objective 1. The training provided by the sampled Durban businesses is therefore relevant. However, further training needs have been identified, relevantly and most prominently that of production and manufacturing eco-efficiency.

In keeping training legislatively updated, 71% of business respondents agree that the leadership of their companies are communicated regularly with legal updates and refresher legal training. However, 25% of business respondents disagreed with this indicating a substantial number of business executives in this sample are not kept abreast of environmental legislation. Additionally employees have access to subscription-based legal registers as confirmed by 83% of Business Respondents.

Furthermore, internal-company sourced environmental information is more easily accessed than externally sourced environmental information as shown by 92% and 67% of Business and Environmental Trainee Respondents respectively. However, the ISO 14001 business respondents find this the case more frequently than do the Environmental Trainees. This indicates that the management level staff has greater access to internal company environmental information than lower tiers of employees in the Durban businesses sampled.

The overall ease of access to environmental information from within the businesses sampled is indicated as legislatively relevant based on commonly reported access to legal registers and databases. Therefore this is indicative of legislatively up to date training and environmental information.

Principle 3: Commitment of financial and human resources

Environmental training budgets are variable among the ISO 14001 Business samples. There is significant uncertainty shown by 37% of business respondents regarding budget allocations for environmental training indicating a limited prioritisation of

environmental training. However, 38% of business respondents confirm an over R60000 per annum allocation while 8% report under R40000 per annum. The environmental trainees similarly respond as only 40% agree that sufficient finances and human resources are regularly committed to environmental training, while 33% are unsure and a substantial 27% indicate no budget is allocated. .

The allocation of human resources was indicated under Principle 1, showing internal company personnel oversee most of the training while local consultants are also regularly used. There therefore appears to be limited but sufficient financial resources prioritised for environmental training, however human resources for training purposes are more substantially indicated. Therefore the selected Durban businesses show sufficient compliance to this principle with significant room for improvement in prioritising an environmental training budget.

Principle 4: Provides the motivation for environmentally aware and performing business culture.

The motivation level of the Durban businesses sampled is indicated by their baseline environmental knowledge and personal values shown through improved environmental behaviours. In this regard a discussed in Objective 1, there are high levels of baseline environmental knowledge and positive personal values and attitudes towards environmental issues. In addition the respondents' keen understanding of the environmental vision of their companies is expressed by the majority of respondents knowing their companies environmental policy. In addition there is an overall 68% of business respondents and 55% of environmental trainees that have shown an understanding of the proactive environmental strategies in their companies such as in water and waste management programs and significantly in environmental auditing activities.

There is also a strongly expressed understanding of the benefits of environmental training indicated by an overall 80% of business respondents predominantly as "changing staff attitudes towards environmentally-sound business practices". While an overall 60% of environmental trainees very agreeably expressed the benefits of environmental training, notably in 'increasing staff competency that effect sound environmental considerations in business decisions'.

However, the other respondents commented that their perception of the attitudes of the Durban businesses towards environmental training is reactive but is showing increasing interest in the activity. In terms of environmental performance, this can only be inferred from the fact that most of the Durban businesses sampled have an established ISO 14001 EMS and this indicates a higher level of environmental performance. Therefore, for the various reasons highlighted, there is good motivation and performance shown by the selected Durban Businesses and therefore principle 4 is sufficiently met in this sample.

Regarding the level of satisfaction with environmental training, the business respondents are more satisfied with their training that the Environmental Trainees. This is indicated by 37% of business respondents and 20% of Environmental Trainees. While there are a small percentage of respondents that are very satisfied with their environmental training, as shown by 13% of business respondents and 7% of Environmental Trainees, however both samples agree similarly that there is need for improvement in the environmental training in their companies indicated by 42% of business respondents and 40% of Environmental Trainees. While none of the business respondents showed any dissatisfaction with their training it is apparent that there is room for improvement. This is similarly indicated by the Environmental Trainees. The reasons for the further improvement are provided by examining the impediments to environmental training. The Environmental Trainee respondents are less optimistic about the environmental training they receive compared to the Business Respondents. The business respondents identified that the requirement of expert knowledge, high costs and difficulty in evaluating the outcomes of environmental training as the greatest impediments to more effective training. The environmental trainees identified high costs, poor management commitment and unclear environmental training criteria and standards.

These responses in combination with the responses described here indicate that there are high levels of motivation created by the current training, and positive perceptions regarding environmental performance, but there is significant room for improvement to increase environmental knowledge and performance.

Principle 5: Provide regular communication of environmental policy and relevant environmental information for employees

Communication is accomplished through various means however the responses show an emphasis on the use of electronic media such emails, subscription-based legal registers, in addition to posters and notices boards as well as regular team or 'toolbox talks'. Business executives regularly receive legal updates and refresher training through subscription based legal registers and databases as confirmed by 83%of Business Respondents. However other electronic media is used to convey environmental information to employees in general. Businesses respondents (39%) confirmed that predominantly on-line legal registers are used to communicate new environmental legislation and information, while emails from industrial associations (21%) and external legal and environmental specialists (29%) are also accessed. Non-electronic media such as notice-boards and posters were predominantly confirmed as common methods of communication by 36% of Business and 33% of Environmental Trainee respondents. Additionally, Business respondents' comments indicate weekly toolbox or team talks are also used to communicate environmental information.

There are a variety of environmental issues communicated through the various methods discussed. The environmental policy is communicated more effectively to company staff in the ISO 14001 businesses sampled as indicated by 71% of the business respondents compared to the 46% of Environmental Trainees. Additionally 96% of business respondents confirmed they communicate their environmental policy to both clients and contractors. Also in agreement, 66% of environmental trainees confirmed this communication while 26% were unsure. However, the other most commonly communicated environmental issues relate to waste management, water usage and reduction, incidents and accidents, legal compliance and sustainability initiatives. However, the least communicated are sustainability reports as indicated by both Business and Environmental Trainee Respondents. However 42% of the business respondents confirmed they sometimes received information on sustainability reports while only 20% of environmental trainees reported they sometimes receive such information.

Communication is therefore successfully managed by the sample of Durban Businesses and therefore shows significant compliance to this principle.

Principle 6: Make training available across the entire company including appointed contractors.

There were 10 tiers of company structure assessed against training duration frequency and frequency of training methods used to train each tier. All company tiers are exposed to environmental training. The tiers that undergo the most environmental training as confirmed by over 60% of business respondents are factory workers, temporary workers, and office staff. Over 50% of business respondents confirmed that contractors, supervisors, junior and senior mangers attend more frequently than CEOs, CFOs and directors. The latter executive tiers attend training least as confirmed by a less than 13% of respondents.

The training methods used to train the executive tiers are predominantly through publications and online training tools whereas videos, workshops and onsite training are predominantly used for the other tiers of staff. It is acknowledge that environmental training needs might differ for executive tiers; however the duration of training should remain relatively similar across all tiers. The data therefore indicates that there is significant room for improvement in exposing executive tiers to more environmental training. However, there is a good indication of environmental training exposure across all other tiers including contractors. While there is room for improvement, there is sufficient availability of environmental training across the entire company structure of the Durban businesses sampled.

Principle 7: Dominance of environmental training learnerships over short courses

The data indicates that there is a predominance of short courses as the duration of training frequently undertaken in 1 to 10 hours per annum as shown by 31% of Business respondents, with an overall predominance of training under 80 hr/a across the various company tiers. However over 80hr/a is only undertaken rarely as indicated by fewer than 13% of Business Respondents. In addition the frequency of courses undertaken show 1 to 2 courses per annum as predominantly indicated by 50% of business respondents and 53% of Environmental Trainees. There is therefore a strong indication that environmental short courses are dominant in the Durban businesses sampled. This principle is therefore not applied in the selected Durban businesses sampled.

6.2.1 Implications of environmental training practices within the broader sustainability rhetoric

The conceptual framework in Chapter 2 highlighted the role of sustainable development as a paradigm shift and environmental management as tool of change in the business arena. The role of ISO 14001 EMS is correlated positively with improved environmental awareness and promotes the implementation of environmental training. The business respondents for example have all shown keener environmental awareness, knowledge and exposure to environmental training than the Environmental Trainee Respondents, of which only 60% were confirmed from ISO 14001 certified businesses. Additionally, the adoption of ISO 14001 as a voluntary compliance EMS is firmly positioned within the ecological modernisation approach which is proactive approach as opposed to end-of-pipe (Jänicke, 2008). ISO 14001 is instrumental to systematising environmental management in the workplace as discussed in Chapter 2 and 3. Ecological modernisation remains a policy approach supporting environmental management in the organisational level, which is the level relevant to this discussion. This win-win approach of integrating environmental management with business priorities is characteristically influenced by ecological modernisation. However, the streamlining of environmental management with other competencies is perhaps prioritised over substantive sustainable development change in this sample of Durban businesses. It is found that the integration of environmental priorities with other Safety and Health competencies is commonplace, indicating that companies are challenged by the pressures to make their workplaces both safe and as environmentally compliant as possible. This is indicated by low management and executive involvement in environmental training and inconsistently prioritised environmental training budgets. As indicated in Chapter 2, in the developing country context such as South Africa, businesses are often challenged by other priorities, often resulting in a weak interpretation of ecological modernisation(Oelofse *et al.*, 2006).While proactivity is a hallmark of the ecological modernisation approach, similarly the respondents indicated good attitudinal responses towards PES implementation in their companies. However this response is inconsistent with the practical implementation of ETA where further improvement is required in terms of executive and management involvement in training, increasing financial commitment to ETA and evaluation and performance standards of ETA activities. According to Jabbour (2013a: 2), this is characteristic of a preventative rather than a proactive response to environmental issues stating, “Environmental issues are seen as the responsibility of a few employees within companies or as an area of environmental management with little strategic influence”.

While ecological modernisation is limited in scholarly contributions on the application of this approach within organisational dynamics, however as presented in Chapter 2, it is an approach that brings incremental and not radical change even at the organisational level(Orsato and Clegg, 2005).Further, environmental management has been identified by some authors as change management, which is essentially an organisational endeavour(Welford, 1998; Blackburn, 2008). As discussed in Chapter 3, effective environmental management is instrumentally leadership-driven while necessarily garnering significant employee buy-in. Environmental training has been strongly indicated by the respondents as an activity that gives greater impetus to environmental priorities and allows for the adoption of cultural and attitude changes in their companies. However the good attitude and cultural changes indicated by the respondents are not matched by their satisfaction with the environmental training received. The respondent's general dissatisfaction with environmental training shows that change is incremental at best but attitude changes are instrumental in bringing about environmental sustainability in the workplace and that greater levels of management commitment is required to achieve this.

The responses of the other relevant stakeholders and role-players also indicate that there is growing pressure for businesses to show commitment and transparency in their environmental activities. The role of sustainability reporting for example is relatively new change for businesses as discussed in Chapter 3(Naidoo, 2009). The availability of sustainability reports to employees and other stakeholders, as indicated by some authors, is an important indicator of the transparency and commitment of businesses to integrate environmental priorities into business agendas(Blackburn, 2008; Naidoo, 2009). The communication of sustainability reports however is shown to be limited among the Respondents. Furthermore it is apparent that management level of staff has greater access to such reports when available, than lower tiers of employees. This possibly indicates that the effective and integrated compilation of sustainability reports is still in its infancy among the selected Durban businesses and communication thereof to the wider public or employees are therefore not fully prioritised.

6.3 RECOMMENDATIONS

In consideration of the literature review, principles of environmental training and results obtained in this study, there are organisational and institutional recommendations that can lead to more effective environmental training in the selected businesses in Durban. These are presented below.

Organisational

The Durban businesses show a high concentration of training among lower tiers of company structure, which is important as it is often the point of environmental impact mitigation measures. However, there needs to be more deliberate incorporation and involvement of the executive and management tiers in environmental training. Company leadership will benefit from this for the purposes of steering their businesses into a culture of environmental stewardship and best practice.

The incorporation of the environmental management with Safety and Health management systems is common practice, however there needs to be intentional and deliberate planning for environmental training in terms of financial and human resources separate from other SHEQ training needs. This will help to effectively prioritise and allocate resources to environmental training.

Environmental training topic coverage is good among the Durban Businesses sampled with a strong focus on waste, energy and water-use environmental issues. However relevant training needs for production and supply chain eco-efficiency; environmental legal liability and risk management have been identified. The inclusion of this training can encourage the adoption of clean technology innovation, cost reductions in business operations and greater regulatory compliance.

Institutional

Indicated strongly by the Durban businesses sampled here, are for greater clarification of environmental training standards. Together with Government, Business, NGOs and Industry Associations, consultations regarding the development of industry specific environmental training standards are recommended for investigation. This will assist in mainstreaming effective and directed environmental training across Durban. Specific issues relating to the

costs of training, evaluation methods of training and qualifications of the Training Providers are further potential areas of address in such an endeavour.

The use of company personnel and local consultants for environmental training is predominant. However the use of universities and tertiary education services are limited. There is a domination of environmental short courses in the selected Durban businesses. This can be overcome by the introduction of learnerships programs in consultation with the local academic institutions to offer more relevant and substantial training to develop specific environmental competencies separate from the predominance of SHEQ roles currently undertaking environmental training activities in the Durban businesses sampled.

The selected Durban businesses show an affinity for industrial associations as one of the important information dissemination platforms for environmental issues. There is however an indicated need for inter-industry collaboration for the specific purpose of environmental training. An investigation into this can also result in greater and more deliberate measures in the formation of new associations for the purposes of environmental best practice and inter-industry training support.

6.4 CONCLUSION

This study aimed to review the environmental training practices of selected Durban Businesses. The Durban businesses show positive environmental awareness and environmental training practices. It is confirmed that the ISO 14001 certification criteria for selecting the Durban business respondents has indicated that environmental training practices are more effectively established through this EMS. This has been elucidated further in comparison to other Durban businesses that have been randomly sampled through the responses of employees undergoing environmental training, the Environmental Trainee sample, in addition to various other respondents.

The objectives of this research have been satisfied finding that the extent of environmental training practices is widely practiced in the selected Durban businesses. The perception of management and employees positively link environmental training to improved environmental management and performance. The formulation of 7 environmental training principles further provided the basis to evaluate environmental training as effectively implemented however the

following needs for further improvement have been identified for the selected Durban businesses:

- Need for more involvement of management and executive levels of company structures in environmental training activities.
- Need for further training topic coverage in production and manufacturing eco-efficiency; environmental legal liability and risk management.
- Need to prioritise environmental training in financial budgeting allocation separate from other Safety and Health priorities.
- Need for inter-industry collaboration and information sharing regarding environmental training best practice.
- Need for institutional arrangements and consultations for specific environmental training standards and benchmarks.
- Need for learnerships or more substantial environmental management learning opportunities in collaboration with university and academic institutions.

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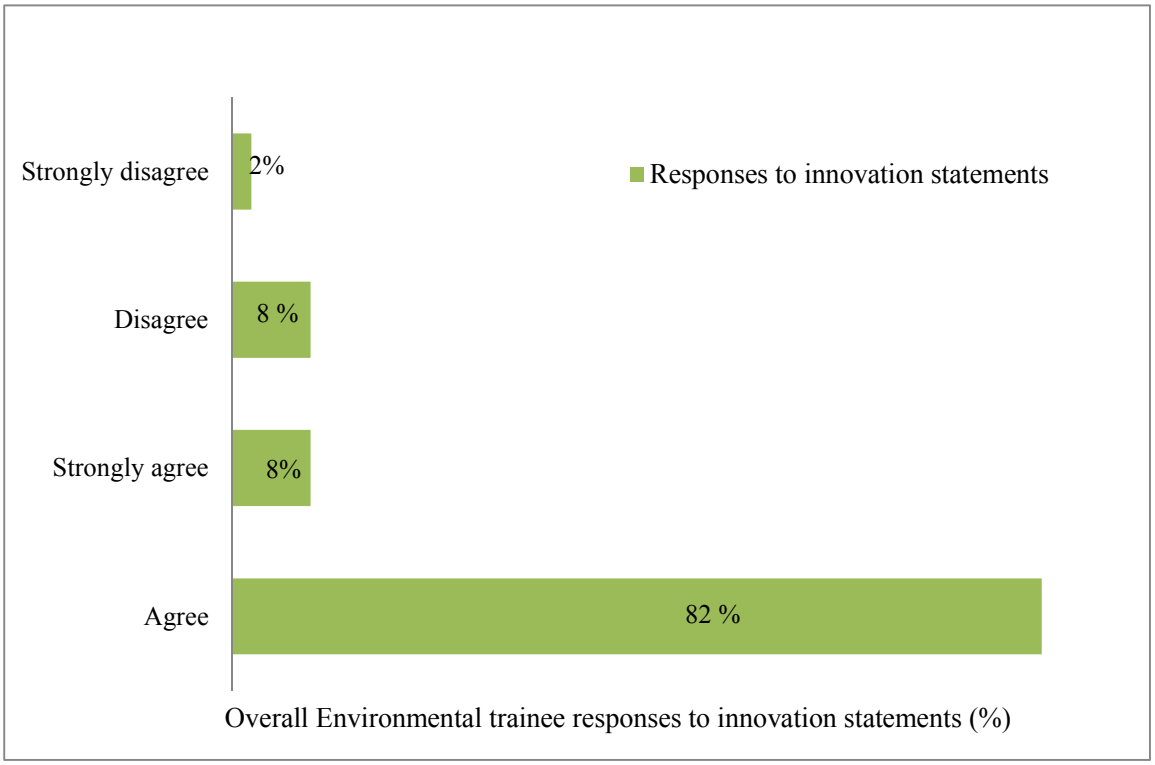
APPENDICES

APPENDIX 1: SETAS IN SOUTH AFRICA

The 21 SETAs in South Africa (SAQA, 2012:7)

Sector Education Training Authorities (SETA)
FASSETA Financial and Accounting Services Sector Education and Training Authority
BANKSETA Banking Sector Education and Training Authority
CHIETA Chemical Industries Education and Training Authority
FP&M SETA Fibre Processing Manufacturing Sector Education and Training Authority
CETA Construction Education and Training Authority
ETDP Education, Training and Development Practices
EWSETA Energy Sector Education and Training Authority
FOODBEV Food and Beverages Manufacturing Industry Sector Education and Training Authority
HWSETA Health and Welfare Sector Education and Training Authority
INSETA Insurance Sector Education and Training Authority
LGSETA Local Government Sector Education and Training Authority
MICTMedia, Advertising, Information and Communication Technologies Sector Education and Training Authority
MQA Mining Qualifications Authority
MERSETA Manufacturing, Engineering and Related Services Sector Education and Training Authority
SASSETA Safety and Security Sector Education & Training Authority
AGRISETA Agriculture Sector Education and Training Authority
PSETA Public Service Sector Education and Training Authority
SERVICES Services Sector Education and Training Authority
CATHSSETA Culture, Arts, Tourism, Hospitality and Sport Education and Training Authority
TETA Transport Education and Training Authority
W&RSETA Wholesale and Retail Sector Education and Training Authority

APPENDIX 2: OVERALL ENVIRONMENTAL TRAINEE RESPONSES TO INNOVATION IN BUSINESS



Innovation Statements
1. Environmental Training enables better innovation in business
2. In our business, environmentally sound technological innovations are quickly accepted when they are available
3. In our business, management participates actively in the search for new and innovative environmental ideas
4. In our business, innovation is perceived as risky and there is a resistance to innovation
5. In our business, environmental innovation is quickly accepted in project/program management

APPENDIX 3: BUSINESS RESPONDENT'S QUESTIONNAIRE

UNIVERSITY OF KWAZULU-NATAL

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

SCHOOL OF AGRICULTURAL EARTH & ENVIRONMENTAL SCIENCE

Information Sheet for Masters Research Project

I, Dianne Sennoga, am a currently registered Masters student at the University of Kwazulu-Natal, School of Agricultural Earth & Environmental Science. I am conducting a research entitled: " A Review of Environmental Training and Awareness Practices, within selected Durban businesses".

The objectives of the research are:

1. To investigate the extent of environmental training and awareness(ETA) within Durban businesses
2. Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.
3. The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation
4. Develop a set of ETA principles to evaluate the ETA practices

You have been chosen to participate in this project based on:

1. You form part of identified key informants that represent relevant experiences of organisational learning in terms of Environmental Training and Awareness in a Durban based business. Your response will aid a greater understanding of ETA practices in Durban specifically on environmental knowledge, attitudes, culture and effectiveness in the workplace.

Participation in this study is undertaken with the understanding that:

1. All information provided will be treated with the strictest confidence.
2. Participation is voluntary and you have the right to choose NOT to participate in the survey at any point. Should you decide not to participate, you will not in any way be disadvantaged.
3. All information that you provide will be used for research purposes only.
4. Your anonymity is guaranteed. All responses provided will be recorded in writing however no names will be attached to any particular response.
5. Please feel free to raise questions should you require more information on these questions.
6. The entire questionnaire is expected to take approximately 15 to 30 minutes to complete.
7. The data obtained from this exercise will be stored with the research supervisor, in a secure location at the University of KwaZulu-Natal for a period of five(5) years, after which it will be shredded.

1. Should you have any further queries regarding this research, or would like more information about the topic, please contact:
    - Researcher, Dianne Sennoga on 981207634@stu.ukzn.ac.za
    - Supervisor, Dr Michael Gebreslasie on Gebreslasie@ukzn.ac.za.
    - Humanities and Social Science Research Ethics Committee: Mariette Snyman, 031 260 8350 or email: snymanm@ukzn.ac.za

DECLARATION

I……(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire, with no consequences.

SIGNATURE OF PARTICIPANT ……

DATE……

BUSINESS EMPLOYEE & MANAGEMENT QUESTIONNAIRE

The aim of this research study is to review the environmental training and awareness practices within selected Durban businesses.

The contribution of this proposed research will add to the growing interest in environmental training and its importance in being an engine to drive change and innovation within businesses to improve environmental performance and promote sustainable business practices in a local context. Environmental training has been correlated positively with environmental performance. Therefore a study into the local context of this assertion will be an important contribution in to the environmental management and corporate sustainability rhetoric.

Please return the completed Questionnaire to:

Dianne Sennoga on 981207634@stu.ukzn.ac.za or disennoga@yahoo.com

For purposes of feedback on this research, please provide the following:

Email:_____

Telephone:_____

SECTION A

Sample Description (Anonymity of information will be maintained)

Please state your profession:

Age :

Are you: MALE FEMALE

Company Name/Employer:

Number of staff at company/branch:

Duration of employment at current company:

Your highest educational qualification:

Primary School	High School	Diploma	Degree
Honours	Masters	PhD	Other:_____

SECTION B

Environmental Knowledge

1. Which of the following is better for the environment? (Tick answer/s ✓)

Recycling end products and waste Reusing products and waste

Reducing the amount of waste Don't know

2. The air emissions from the burning of petroleum or coal contributes to: (Tick answer/s ✓)

Ozone depletion Acid Rain Eutrophication Don't know

3. Which of these emissions cause acid rain? (Tick answer/s ✓)

Carbon dioxide Sulphur dioxide Phosphoric Acid Don't know

4. Which of the following are natural renewable resources? (Tick answer/s ✓)

Trees Biomass Fossil Fuel Don't know

5. Which of the following are renewable energy resources that can be exploited to reduce demand on non-renewable resources? (Tick answer/s ✓)

Wind energy Hydrostatic electricity Biogas Don't know

6. Which of the following are recyclable?

Glass Paper Waste Oil Don't know

SECTION C

Environmental Attitudes and Culture

A: Agree SA: Stongly Agree D: Disagree SD:Strongly Disagree

1. Consider the following statements: (Tick answer ✓)	A	SA	D	SD
I am genuinely interested in environmental issues				
Outside of work, I have changed to becoming more environmentally responsible				
I recycle waste at home and at work				
I try not to litter				
I try to use energy efficient lighting				
I try to car-pool to save money and the environment				
It is important to consider environmental issues in business today				
Environmental issues deserve a greater part of business resources & finances				
I am aware of the environmental impacts of our company's business activities				
I feel comfortable to take environmental considerations into my business decision making				
Voluntary Environmental Champions are appointed to keep important environmental issues on our agenda				
This company is environmentally progressive				
I consider environmental issues a change to business-as-usual practices				
This company encourages this change positively				
It is my opinion that the leadership of this company has taken ownership of its environmental responsibilities				

2. Consider the following statements: (Tick answer ✓)	A	SA	D	SD
Environmental Training enables better innovation in business				
In our business, environmentally sound technological innovations are quickly accepted when they are available				
In our business, management participates actively in the search for new and innovative environmental ideas				
In our business, innovation is perceived as risky and there is a resistance to innovation				
In our business, environmental innovation is quickly accepted in project/program management				

SECTION D

Environmental Training, commitment, communication, resources and methods

1. How many environmental training courses have you attended annually? (Tick answer ✓)

   1 to 2 | 3 to 5 | over 5 | none

2. Is environmental training a priority in this company? YES NO
3. Are there dedicated personnel and staff that oversee environmental training activities?

   YES NO
4. Is training at this company conducted by any of the following training providers?

Training Providers:	YES	NO	SOMETIMES
International Consultants			
University/Technikon			
Environmental Manager/Coordinator			
Line Management			
HR Knowledge Manager			
Local Consultants			
In-house trainers			
Other *(please specify)*			

5. What are the possible internal (*INT.*) and external (*EXT.*) environmental trainer problems encountered at this company? Tick answer ✓

Trainer Problems:	**YES**		**NO**		**SOMETIMES**	
	INT.	*EXT.*	*INT.*	*EXT.*	*INT.*	*EXT.*
Shortage of training staff						
Lack of environmental knowledge						
Lack of training expertise						
Scarcity of quality courses						
High costs						
Other:						

6. What is your overall satisfaction with the environmental training currently being conducted at this company? Tick answer ✓

Dissatisfied | Neutral | Need for improvement | Satisfied | Very Satisfied

7. Are the following topics covered in environmental training?

Which of the following environmental issues are:	Yes, it's considered in our Environmental Training.	Currently not done but is needed.	No –it's not considered or needed
Hazardous Chemicals			
Emission Permits & Limits			
Accident/Spillage Mitigation			
Water use and conservation			
Waste recycling, reuse and reduction strategies			
Energy efficiency			
Supply Chain eco- efficiency			
Production and manufacturing eco-efficiency			
Environmental Sustainability Best Practice in Business			

General Environmental Awareness			
Environmental Legal Liability & Risk Management			
Environmental Performance Systems Training			
SHE Induction			
EIA and Auditing methodologies			
Other - please specify			

8. How many *hours per annum* approximately does each employee tier spend in environmental training	1 – 10	10 -20	20-40	+80	None	As needed	No specific time
Board of Directors							
CEO							
CFO							
Senior Managers							
Junior Managers							
Supervisors							
Office/Admin Staff							
Factory Staff							
Temporary Workers							
Contractors							

9. What is the annual environmental training budget at this company or branch, as is applicable?

Costs (R)/ annum	*Tick appropriate ✓*
0-20 000	
20 000- 40 000	
40 000 – 60 000	
Over 60 000	
Unsure	

10. What are the commonly used training methods for the various tiers of company employees? (*tick appropriate*)

Training methods per employee tier	Workshops	Lectures	Publications	Videos	On-site training	Field trips	Online/computerised courses
Board of Directors							
CEO							
CFO							
Senior Managers							
Junior Managers							
Supervisors							
Office/Admin Staff							
Factory Staff							
Temporary Workers							
Contractors							

11. How are environmental training courses conducted in relation to other training needs?

	YES	NO	SOMETIMES
Part of SHEQ training			
Integrated with other training			
Part of induction training			
Part of Environmental Health training			
As a separate course			

12. Are refresher and update environmental liability courses given and attended regularly by the senior corporate executives? YES NO
13. Are electronic subscriptions services available to company employees to receive updates on changes in environmental regulations and laws that affect specific business functions?
    YES NO Not aware of any
14. If yes, what electronic subscription services are available to your company employees to receive updates on changes in environmental regulations?

15. What is ISO 14001? Tick answer/s ✓

An environmental product certification | Certified environmental management system | A health & safety system certification

16. Consider the following:	YES	NO	UNSURE
Is this company ISO 14001 certified			
Does this company have an environmental policy?			
Is there a difference between environmental health and environmental management?			

17. Has understanding and knowing the environmental policy been made a priority in this company? YES | NO | Yes, but still poorly understood | N/A
18. As part of a robust ISO14001 system, regularly monitoring of significant environmental impacts is required. True | False | Unsure
19. How well is environment-related information communicated internally?

	Never	Sometimes	Frequently	Most Common
Posters/Notice Board				
Newsletters				
Magazines				
Website				
Other:				

20. Are your clients and subcontractors made aware of your environmental policy and impact reduction measures? Yes | No
21. If yes, how are these communicated?

22. What is the level of ease of access to environmental information internally and external to the company?

Environmental Information Access	Poor Access	Easy Access	Not relevant or applicable
Internal/Company			
External Information Sources			

23. What types of company-specific environment-related information is communicated regularly to company staff?

Information communication on:	Never	Sometimes	Frequently	Most Common
Pollution & Emissions				
Waste management				
Energy Consumption				
Incidents/Accidents				
Legal Compliance				
Lessons Learnt				
Water usage and reduction				
Company environmental policy issues				
Sustainability Initiatives				
Company Sustainability Reports				

24. Are the following proactive strategies implemented in your business: (Tick answer ✓)	YES	NO	Not relevant	Unsure
Implementation of periodic environmental audits				
Implementation of detailed studies about the energy consumption				
Education for clients regarding environmentally responsible practices				
Sponsorship of activities related to the protection of the environment				
Inclusion of environmental arguments in marketing activities				
Use of non-polluting clean products				

Systematic program of selective recycling for materials				
Systematic purchasing of recycled materials or with environmental labels				
Use of equipment and systems that reduces energy consumption and waste				
Use of renewable energies				
Systematic program of water saving				

SECTION E

Benefits, Limitations & Way Forward

N: Neutral A: Agree SA: Stongly Agree D: Disagree SD:Strongly Disagree

1. Are the following environmental training benefits relevantly prioritised in this company?	N	A	SA	D	SD
Creating an environmentally aware corporate culture					
Increasing staff competency that effect sound environmental considerations in business decisions					
Innovation and positive change in the direction of environmental stewardship and product development					
Changing staff attitudes towards environmentally sound business practices					
Creating a green and eco-friendly corporate image					
Creating and marking out a competitive advantage in your market segment					
Operational and Production efficiency					
Business and operational Risk Reduction					
Improving the effectiveness of company EMS					
Enable greater understanding of business environmental impacts and how such impacts can be eliminated or mitigated					
Improved compliance to legal and industry standards					
Adhering to Group environmental requirements					
Company Governance commitment					

2. What are the possible limitations to environmental training? (Tick answer ✓)	Agree	Strongly Agree	Disagree	Strongly Disagree
High costs				
Requires expert knowledge				
Unclear Environmental Training Criteria & Standards				
Time consuming				
Difficulty in evaluating the outcomes				
Determining relevance to business				
Too technical to understand				
Lack organisational learning culture				
Poor Management Commitment				
Other - please specify				

3. Going forward is there a need for and inter-company/industry co-ordination and communication regarding best environmental training topics and practices? YES NO Please explain.

THANK YOU FOR YOUR TIME & EFFORT IN COMPLETING THIS QUESTIONNAIRE!

APPENDIX 4: ENVIRONMENTAL TRAINEE QUESTIONNAIRE

UNIVERSITY OF KWAZULU-NATAL
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE
SCHOOL OF AGRICULTURAL EARTH & ENVIRONMENTAL SCIENCE

Information Sheet for Masters Research Project

I, Dianne Sennoga, am a currently registered Masters student at the University of Kwazulu-Natal, School of Agricultural Earth & Environmental Science. I am conducting a research entitled: " A Review of Environmental Training and Awareness Practices, within selected Durban businesses".

The objectives of the research are:

1. To investigate the extent of environmental training and awareness(ETA) within Durban businesses
2. Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.
3. The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation
4. Develop a set of ETA principles to evaluate the ETA practices

You have been chosen to participate in this project based on:

1. You form part of identified key informants that represent relevant experiences of organisational learning in terms of Environmental Training and Awareness in a Durban based business. Your response will aid a greater understanding of ETA practices in Durban specifically on environmental knowledge, attitudes, culture and effectiveness in the workplace.

Participation in this study is undertaken with the understanding that:

1. All information provided will be treated with the strictest confidence.
2. Participation is voluntary and you have the right to choose NOT to participate in the survey at any point. Should you decide not to participate, you will not in any way be disadvantaged.
3. All information that you provide will be used for research purposes only.
4. Your anonymity is guaranteed. All responses provided will be recorded in writing however no names will be attached to any particular response.
5. Please feel free to raise questions should you require more information on these questions.
6. The entire questionnaire is expected to take approximately 15 to 30 minutes to complete.
7. The data obtained from this exercise will be stored with the research supervisor, in a secure location at the University of KwaZulu-Natal for a period of five(5) years, after which it will be shredded.
1. Should you have any further queries regarding this research, or would like more information about the topic, please contact:
    - Researcher, Dianne Sennoga on 981207634@stu.ukzn.ac.za
    - Supervisor, Dr Michael Gebreslasie on Gebreslasie@ukzn.ac.za.
    - Humanities and Social Science Research Ethics Committee: Mariette Snyman, 031 260 8350 or email: snymanm@ukzn.ac.za

DECLARATION

I……(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire, with no consequences.

SIGNATURE OF PARTICIPANT ……

DATE: ……

BUSINESS EMPLOYEE QUESTIONNAIRE

The aim of this research study is to review the environmental training and awareness practices within selected Durban businesses.

The contribution of this proposed research will add to the growing interest in environmental training and its importance in being an engine to drive change and innovation within businesses to improve environmental performance and promote sustainable business practices in a local context. Environmental training has been correlated positively with environmental performance. Therefore a study into the local context of this assertion will be an important contribution in to the environmental management and corporate sustainability rhetoric.

For purposes of feedback on this research, please provide the following:

Name:

Email:_____

Telephone:_____

SECTION A

Sample Description (Anonymity of information will be maintained)

Please state your profession:

Age :

Are you: MALE FEMALE

Company Name/Employer:

Number of staff at company/branch:

Duration of employment at current company:

Your highest educational qualification:

Primary School	High School	Diploma	Degree
Honours	Masters	PhD	Other:_____

SECTION B

Environmental Knowledge

1. Which of the following is better for the environment? (Tick answer/s ✓)

Recycling end products and waste Reusing products and waste

Reducing the amount of waste Don't know

2. The air emissions from the burning of petroleum or coal contributes to: (Tick answer/s ✓)

Ozone depletion Acid Rain Eutrophication Don't know

3. Which of these emissions cause acid rain? (Tick answer/s ✓)

Carbon dioxide Sulphur dioxide Phosphoric Acid Don't know

4. Which of the following are natural renewable resources? (Tick answer/s ✓)

Trees Biomass Fossil Fuel Don't know

5. Which of the following are renewable energy resources that can be exploited to reduce demand on non-renewable resources? (Tick answer/s ✓)

Wind energy Hydrostatic electricity Biogas Don't know

6. Which of the following are recyclable?

Glass Paper Waste Oil Don't know

SECTION C

Environmental Attitudes and Culture

A: Agree SA: Stongly Agree D: Disagree SD:Strongly Disagree

1. Consider the following statements: (Tick answer ✓)	A	SA	D	SD
I am genuinely interested in environmental issues				
Outside of work, I have changed to becoming more environmentally responsible				
I recycle waste at home and at work				
I try not to litter				
I try to use energy efficient lighting				
I try to car-pool to save money and the environment				
It is important to consider environmental issues in business today				
Environmental issues deserve a greater part of business resources & finances				
I am aware of the environmental impacts of our company's business activities				
I feel comfortable to take environmental considerations into my business decision making				
Voluntary Environmental Champions are appointed to keep important environmental issues on our agenda				
This company is environmentally progressive				
I consider environmental issues a change to business-as-usual practices				
This company encourages this change positively				
It is my opinion that the leadership of this company has taken ownership of its environmental responsibilities				

2. Consider the following statements: (Tick answer ✓)	A	SA	D	SD
Environmental Training enables better innovation in business				
In our business, environmentally sound technological innovations are quickly accepted when they are available				
In our business, management participates actively in the search for new and innovative environmental ideas				
In our business, innovation is perceived as risky and there is a resistance to innovation				
In our business, environmental innovation is quickly accepted in project/program management				

SECTION D

Environmental Training, commitment, communication, resources and methods

1. How many environmental training courses have you attended annually? (Tick answer ✓)

   1 to 2 | 3 to 5 | over 5 | none

2. Is environmental training a priority in your company? YES NO
3. Are there dedicated personnel and staff that oversee environmental training activities at your company? YES NO
4. Is training at your company conducted by any of the following training providers?

Training Providers:	YES	NO	SOMETIMES
International Consultants			
University/Technikon			
Environmental Manager/Coordinator			
Line Management			
HR Knowledge Manager			
Local Consultants			
In-house trainers			
Other *(please specify)*			

5. In your opinion, what are the possible internal (*INT.*) and external (*EXT.*) environmental trainer problems encountered at your company? Tick answer ✓

Trainer Problems:	YES		NO		SOMETIMES		UNSURE
	INT.	*EXT.*	*INT.*	*EXT.*	*INT.*	*EXT.*	
Shortage of training staff							
Lack of environmental knowledge							
Lack of training expertise							
Scarcity of quality courses							
High costs							
Other:							
Please specify?							

6. What is your overall satisfaction with the environmental training currently being conducted at your company? Tick answer ✓

Dissatisfied	Neutral	Need for improvement	Satisfied	Very Satisfied

7. Are the following topics covered in environmental training?

Which of the following environmental issues are:	Yes, it's considered in our Environmental Training.	Currently not done but is needed.	No –it's not considered or needed
Hazardous Chemicals			
Emission Permits & Limits			
Accident/Spillage Mitigation			
Water use and conservation			
Waste recycling, reuse and reduction strategies			
Energy efficiency			
Supply Chain eco- efficiency			
Production and manufacturing eco-efficiency			
Environmental Sustainability Best Practice in Business			

General Environmental Awareness			
Environmental Legal Liability & Risk Management			
Environmental Performance Systems Training			
SHE Induction			
EIA and Auditing methodologies			
Other - **please specify**			

8. Does your company invest significant resources, time and cost into environmental training of it's staff? YES NO UNSURE
9. What are the commonly used training methods for company employees? (*tick appropriate*)

	Most common	Not done	Sometimes done	N/A
Workshops				
Lectures				
Publications				
Videos				
On-site training				
Field trips				
Online/computerised courses				
Other: ***please specifiy***				

10. How are environmental training courses conducted in relation to other training needs?

	YES	NO	SOMETIMES
Part of SHEQ training			
Integrated with other training			
Part of induction training			
Part of Environmental Health training			
As a separate course			

11. Are electronic subscriptions services available to company employees to receive updates on changes in environmental regulations and laws that affect specific business functions?
    YES NO Not aware of any
12. If yes, what electronic subscription services are available to your company employees to receive updates on changes in environmental regulations?

13. What is ISO 14001? Tick answer/s ✓
    An environmental product certification | Certified environmental management system
    A health & safety system certification

14. Consider the following:	YES	NO	UNSURE
Is your company ISO 14001 certified			
Does your company have an environmental policy?			
Is there a difference between environmental health and environmental management?			

15. Has understanding and knowing the environmental policy been made a priority in your company? YES NO Yes, but still poorly understood N/A
16. As part of a robust ISO14001 system, regularly monitoring of significant environmental impacts is required. True False Unsure

17. How well is environment-related information communicated internally in your company?

	Never	Sometimes	Frequently	Most Common
Posters/Notice Board				
Newsletters				
Magazines				
Website				
Other:				

18. Are your company clients and subcontractors made aware of your environmental policy and impact reduction measures? Yes No Unsure

19. What is the level of ease of access to environmental information internally and external to the company?

Environmental Information Access	Poor Access	Easy Access	Not relevant or applicable
Internal/Company			
External Information Sources			

20. What types of company-specific environment-related information is communicated regularly to company staff?

Information communication on:	Never	Sometimes	Frequently	Most Common	Unsure
Pollution & Emissions					
Waste management					
Energy Consumption					
Incidents/Accidents					
Legal Compliance					
Lessons Learnt					
Water usage and reduction					
Company environmental policy issues					
Sustainability Initiatives					
Company Sustainability Reports					

21. Are the following proactive strategies implemented in your business: (Tick answer ✓)	YES	NO	Not relevant	Unsure
Implementation of periodic environmental audits				
Implementation of detailed studies about the energy consumption				
Education for clients regarding environmentally responsible practices				
Sponsorship of activities related to the protection of the environment				
Inclusion of environmental arguments in marketing activities				
Use of non-polluting clean products				
Systematic program of selective recycling for materials				
Systematic purchasing of recycled materials or with environmental labels				
Use of equipment and systems that reduces energy consumption and waste				
Use of renewable energies				
Systematic program of water saving				

SECTION E

Benefits, Limitations & Way Forward

N: Neutral A: Agree SA: Stongly Agree D: Disagree SD:Strongly Disagree

1. Are the following environmental training benefits relevantly prioritised in your company?	N	A	SA	D	SD
Creating an environmentally aware corporate culture					
Increasing staff competency that effect sound environmental considerations in business decisions					
Innovation and positive change in the direction of environmental stewardship and product development					
Changing staff attitudes towards environmentally sound business practices					
Creating a green and eco-friendly corporate image					
Creating and marking out a competitive advantage in your market segment					
Operational and Production efficiency					
Business and operational Risk Reduction					

	N	A	SA	D	SD
Improving the effectiveness of company EMS					
Enable greater understanding of business environmental impacts and how such impacts can be eliminated or mitigated					
Improved compliance to legal and industry standards					
Adhering to Group environmental requirements					
Company Governance commitment					

2. What are the possible limitations to environmental training? (Tick answer ✓)	Agree	Strongly Agree	Disagree	Strongly Disagree
High costs				
Requires expert knowledge				
Unclear Environmental Training Criteria & Standards				
Time consuming				
Difficulty in evaluating the outcomes				
Determining relevance to business				
Too technical to understand				
Lack organisational learning culture				
Poor Management Commitment				
Other - please specify				

3. Going forward is there a need for and inter-company/industry co-ordination and communication regarding best environmental training topics and practices? YES NO Please explain.

APPENDIX 5: OTHER RESPONDENT'S QUESTIONNAIRE

UNIVERSITY OF KWAZULU-NATAL

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

SCHOOL OF AGRICULTURAL EARTH & ENVIRONMENTAL SCIENCE

Information Sheet for Masters Research Project

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2. Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.
3. The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation
4. Develop a set of ETA principles to evaluate the ETA practices

You have been chosen to participate in this project based on:

1. You form part of identified key informants that represent relevant experiences of engaging with the Durban business community. Your response will aid a greater understanding of Environmental Training and Awareness practices within this area specifically as it pertains to perceived effectiveness of ETA on environmental attitudes, culture and effectiveness in the workplace.

Participation in this study is undertaken with the understanding that:

1. All information provided will be treated with the strictest confidence.
2. Participation is voluntary and you have the right to choose NOT to participate in the survey at any point. Should you decide not to participate, you will not in any way be disadvantaged.
3. All information that you provide will be used for research purposes only.
4. Your anonymity is guaranteed. All responses provided will be recorded in writing however no names will be attached to any particular response.
5. Please feel free to raise questions should you require more information on these questions.
6. The entire questionnaire is expected to take approximately 15 to 30 minutes to complete.
7. The data obtained from this exercise will be stored with the research supervisor, in a secure location at the University of KwaZulu-Natal for a period of five(5) years, after which it will be shredded.
8. Should you have any further queries regarding this survey, or would like more information about the topic, please contact:
    - Reseacher, Dianne Sennoga on 981207634@stu.ukzn.ac.za or
    - Supervisor, Dr Michael Gebreslasie on Gebreslasie@ukzn.ac.za.
    - Humanities and Social Science Research Ethics Committee: Mariette Snyman, 031 260 8350 or email: snymanm@ukzn.ac.za

DECLARATION

I……(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire, without consequences.

SIGNATURE OF PARTICIPANT ……

DATE……

DCCI, ENVIRONMENTAL FORUM QUESTIONNAIRE

The aim of this research study is to review the environmental training and awareness practices within selected Durban businesses.

The contribution of this proposed research will add to the growing interest in environmental training and its importance in being an engine to drive change and innovation within businesses to improve environmental performance and promote sustainable business practices in a local context. Environmental training has been correlated positively with environmental performance. Therefore a study into the local context of this assertion will be an important contribution in to the environmental management and corporate sustainability rhetoric.

Please return the completed Questionnaire to:

Dianne Sennoga on 981207634@stu.ukzn.ac.za or disennoga@yahoo.com

For purposes of feedback on this research, please provide the following:

Email:_____

Telephone:_____

SECTION A

Please state your profession:

Age :

Are you: MALE FEMALE

Company Name/Employer:

Number of staff at company/branch

Duration of employment at current company:

Your highest educational qualification:

Primary School	High School	Diploma	Degree
Honours	Masters	PhD	Other:_____

SECTION B

1. What is the role of the Environmental Forum within the DCCI?

2. What is your understanding of the demand for environmental training within the Durban business community? (Tick answer/s ✓)

   Poor Good Excellent Improving Unsure

3. Is there a difference between environmental health and environmental management? (Tick answer/s ✓) YES NO

4. How important do you think the role of environmental training and awareness (ETA) is in Durban business? (Tick answer/s ✓)

   Very Important Significant Unimportant Less Important

5. What is your perception of the companies in Durban in terms of their attitude towards environmental training? (Tick answer/s ✓)

Proactive	Reactive	Increasing interest	Change resistant	Poor interest	Knowledge lacking

6. Has environmental training and awareness (ETA) been a topic of discussion within the Environmental Forum? YES NO
    a. If yes, what are the main issues of discussion regarding ETA?

7. Is the DCCI Environmental Forum considered an advocate for better environmental awareness to local businesses? YES NO
8. Are there dedicated personnel and staff that oversee environmental awareness within the DCCI Environmental Forum? YES NO
9. Are specific environmental awareness topics presented by any of the following training service providers at the DCCI Environmental Forum:

Training Providers:	YES	NO	SOMETIMES
International Consultants			
University/Technikon			
Environmental Manager/Coordinator			
Line Management			
HR Knowledge Manager			
Local Consultants			
In-house trainers			
Other *(please specify)*			

10. What are the specific efforts of the DCCI Environmental Forum to increase environmental awareness and best practice among Durban Businesses?

11. In your experience, is there a greater interest in environmental issues shown by ISO 14001 certified companies? YES NO UNSURE

12. Approximately what percentage of business participation in the Environmental Forum are by ISO 14001 companies?_____ or UNSURE

13. In your opinion are these environmental training topics relevant to Durban businesses?	Agree	Disagree	Unsure
Hazardous Chemicals			
Emission Permits & Limits			
Accident/Spillage Mitigation			
Water use and conservation			
Waste recycling, reuse and reduction strategies			
Energy efficiency			
Supply Chain eco- efficiency			
Production and manufacturing eco-efficiency			
Environmental Sustainability Best Practice in Business			
General Environmental Awareness			
Environmental Legal Liability & Risk Management			
Environmental Performance Systems Training			
SHE Induction			
EIA and Auditing methodologies			
Sustainability Reporting & Initiatives			
Other - please specify			

Tick answer ✓N:Nuetral/ Unsure A: Agree SA: Stongly Agree D: Disagree SD:Strongly

14. Are the following environmental training benefits often considered a priority among Durban Businesses?	N	A	SA	D	SD
Creating an environmentally aware corporate culture					
Increasing staff competency that effect sound environmental considerations in business decisions					
Innovation and positive change in the direction of environmental stewardship and product development					
Changing staff attitudes towards environmentally sound business practices					
Creating a green and eco-friendly corporate image					
Creating and marking out a competitive advantage in your market segment					
Operational and Production efficiency					
Business and operational Risk Reduction					
Improving the effectiveness of company EMS					
Enable greater understanding of business environmental impacts and how such impacts can be eliminated or mitigated					
Improved compliance to legal and industry standards					
Adhering to Group environmental requirements					
Company Governance commitment					

SECTION C

1. Going forward is there a perceived need for inter-industry co-ordination and communication in the area of environmental training? YES NO

Please explain?

2. In your opinion what are the possible limitations to conducting environmental training in Durban Businesses? (Tick answer ✓)

	Agree	Strongly Agree	Disagree	Strongly Disagree
Too expensive				
Requires expert knowledge				
Time consuming				
Unclear Environmental Training Criteria & Standards				
Difficulty in evaluating the output				
Relevance to business				
Too technical to understand				
Lack organisational learning culture				
Poor Management Commitment				
Other - please specify				

3. Are greater environmental training standards and criteria needed for Durban businesses?
YES NO UNSURE

Please explain

THANK YOU FOR YOUR TIME & EFFORT IN COMPLETING THIS QUESTIONNAIRE!

UNIVERSITY OF KWAZULU-NATAL
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE
SCHOOL OF AGRICULTURAL EARTH & ENVIRONMENTAL SCIENCE

Information Sheet for Masters Research Project

I, Dianne Sennoga, am a currently registered Masters student at the University of Kwazulu-Natal, School of Agricultural Earth & Environmental Science. I am conducting a research entitled: " A Review of Environmental Training and Awareness Practices, within selected Durban businesses".

The objectives of the research are:

1. To investigate the extent of environmental training and awareness(ETA) within Durban businesses
2. Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.
3. The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation
4. Develop a set of ETA principles to evaluate the ETA practices

You have been chosen to participate in this project based on:

1. You form part of identified key informants that represent relevant experiences of engaging with the South Durban industrial business community. Your response will aid a greater understanding of Environmental Training and Awareness practices within this industrial area specifically as it pertains to perceived effectiveness of ETA on environmental attitudes, culture and effectiveness in the workplace.

Participation in this study is undertaken with the understanding that:

1. All information provided will be treated with the strictest confidence.
2. Participation is voluntary and you have the right to choose NOT to participate in the survey at any point. Should you decide not to participate, you will not in any way be disadvantaged.
3. All information that you provide will be used for research purposes only.
4. Your anonymity is guaranteed. All responses provided will be recorded in writing however no names will be attached to any particular response.
5. Please feel free to raise questions should you require more information on these questions.
6. The entire questionnaire is expected to take approximately 15 to 30 minutes to complete.
7. The data obtained from this exercise will be stored with the research supervisor, in a secure location at the University of KwaZulu-Natal for a period of five(5) years, after which it will be shredded.
8. Should you have any further queries regarding this research, or would like more information about the topic, please contact:
    - Researcher, Dianne Sennoga on 981207634@stu.ukzn.ac.za
    - Supervisor, Dr Michael Gebreslasie on Gebreslasie@ukzn.ac.za.
    - Humanities and Social Science Research Ethics Committee: Mariette Snyman, 031 260 8350 or email: snymanm@ukzn.ac.za

DECLARATION

I……(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire, with no consequences.

SIGNATURE OF PARTICIPANT ……

DATE: .....

SOUTH DURBAN COMMUNITY ENVIRONMENTAL ALLIANCE QUESTIONNAIRE

The aim of this research study is to review the environmental training and awareness practices within selected Durban businesses.

The contribution of this proposed research will add to the growing interest in environmental training and its importance in being an engine to drive change and innovation within businesses to improve environmental performance and promote sustainable business practices in a local context. Environmental training has been correlated positively with environmental performance. Therefore a study into the local context of this assertion will be an important contribution in to the environmental management and corporate sustainability rhetoric.

Please return the completed Questionnaire to:

Dianne Sennoga on 981207634@stu.ukzn.ac.za or disennoga@yahoo.com

For purposes of feedback on this research, please provide the following:

Email:_____

Telephone:_____

SECTION A

Sample Description (Anonymity of information will be maintained)

Please state your profession:

Age :

Are you: MALE FEMALE

Organisation Name/Employer:

Number of staff at company/branch:

Duration of employment at current company:

Your highest educational qualification:

Primary School	High School	Diploma	Degree
Honours	Masters	PhD	Other:_____

SECTION B

1. What is your understanding of environmental sustainability?

1. What is ISO 14001? Tick answer/s ✓

   An environmental product certification | Certified environmental management system

   A health & safety system certification

2. What is your perceived understanding for the demand of environmental training within the South Durban (SD) industries? (Tick answer/s ✓)

   Poor | Good | Excellent | Unsure

3. Is there a difference between environmental health and environmental management? (Tick answer/s ✓) YES NO

4. If no, please explain?

5. How effective do you think environmental training is within the SD Industries in:

A: Agree SA: Stongly Agree D: Disagree SD:Strongly Disagree				
(Tick answer/s ✓)	A	SA	D	SD
Creating a better understanding of environmental impacts and issues of industry specific activities				
Creating innovative ideas in cleaner production technologies and processes				
Creating a culture of better environmental stewardship				
Creating awareness of global environmental challenges				
Improved environmental performance				
Improved legal compliance				
Improved corporate social responsibility				
Improved sustainability and corporate governance				
Improved transparancy and accountability of environmental performance				
Improved competency in incorporating environmental considerations in business decisions				

6. Which of the following would you consider are important training topics in the South Durban Industries	Agree	Disagree	Unsure
Hazardous Chemicals			
Emission Permits & Limits			
Accident/Spillage Mitigation			
Water use and conservation			
Waste recycling, reuse and reduction strategies			
Energy efficiency			
Supply Chain eco- efficiency			
Production and manufacturing eco-efficiency			
Environmental Sustainability Best Practice in Business			
General Environmental Awareness			

Environmental Legal Liability & Risk Management			
Environmental Performance Systems Training			
SHE Induction			
EIA and Auditing methodologies			
Other - please specify			

SECTION C

6. In your opinion, what are the possible impediments to successful environmental training? (Tick answer ✓)

Possible limitations (Tick answer ✓)	Agree	Strongly Agree	Disagree	Strongly Disagree
High costs				
Requires expert knowledge				
Unclear Environmental Training Criteria & Standards				
Time consuming				
Difficulty in evaluating the outcomes				
Determining relevance to business				
Too technical to understand				
Lack organisational learning culture				
Poor Management Commitment				
Other - please specify				

7. From an SDCEA perspective, what are the important challenges that you think environmental training can address within the South Durban Industries and businesses?

4. Do you think inter-industry co-operation and communication is needed in the area of environmental training?

5. Is the SDCEA considered an advocacy for better environmental awareness in the South Durban Industries? YES NO

Please explain?

THANK YOU FOR YOUR TIME & EFFORT IN COMPLETING THIS QUESTIONNAIRE!

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1. To investigate the extent of environmental training and awareness(ETA) within Durban businesses
2. Determine the validity and efficacy of the training by evaluating the various tiers of company hierarchy that receives the training.
3. The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation
4. Develop a set of ETA principles to evaluate the ETA practices

You have been chosen to participate in this project based on:

1. You form part of identified key informants that represent relevant experiences of organisational learning and training as it pertains to Small & Medium Enterprises in Durban. Your response will aid a greater understanding of Environmental Training and Awareness practices in SMMEs in Durban.

Participation in this study is undertaken with the understanding that:

1. All information provided will be treated with the strictest confidence.
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DECLARATION

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I understand that I am at liberty to withdraw from the project at any time, should I so desire, without consequences.

SIGNATURE OF PARTICIPANT ……

DATE……

SEDA QUESTIONNAIRE

The aim of this research study is to review the environmental training and awareness practices within selected Durban businesses.

The contribution of this proposed research will add to the growing interest in environmental training and its importance in being an engine to drive change and innovation within businesses to improve environmental performance and promote sustainable business practices in a local context. Environmental training has been correlated positively with environmental performance. Therefore a study into the local context of this assertion will be an important contribution in to the environmental management and corporate sustainability rhetoric.

Please return the completed Questionnaire to
Dianne Sennoga on 981207634@stu.ukzn.ac.za or disennoga@yahoo.com

For purposes of feedback on this research, please provide the following:

Email:_____
Telephone:_____

SECTION A

Please state your profession:

Age :

Are you: MALE FEMALE

Duration of employment at current company:

Number of Staff at Company/branch:

Your highest educational qualification:

Primary School	High School	Diploma	Degree
Honours	Masters	PhD	Other:_____

SECTION B

1. To your knowledge how many SMME's are there in the Durban Metropolitan area?

   _____

2. Does your establishment conduct training for SMMEs ? YES NO

   Please explain further

3. Are environmental impacts of SMME operations an important consideration in SMME business training? *Please explain*

4. Is there a perceived need by SMME owners & employees for Environmental Training & Awareness?

   YES NO SOMETIMES

5. Are specific environmental awareness training presented by any of the following training service providers at your training facility?

Training Providers:	YES	NO	SOMETIMES
International Consultants			
University/Technikon			
Local Consultants			
In-house trainers			
Other *(please specify)*			

Tick answer ✓ A: Agree SA: Stongly Agree D: Disagree SD:Strongly Disagree U: Unsure

6. Consider the following:	U	A	SA	D	SD
SMME owners & employees are interested in business related training					
SMMEs owners & employees are interested in environmental training					
SMMEs are concerned about regulatory environmental compliance					
SMME owners show interest in ISO 14001 certification for their businesses					

7. To your knowledge, SMMEs are represented *mostly* in which of the following business sectors in Durban?	(tick answer ✓)
Manufacturing	
Financial Services	
Retail Industry	
Corporate and IT services	
Construction	
Light Industry	
Heavy Industry	
Transportation	
Telecommunications	
Other/s, Please specify	

SECTION C

1. What is your perception of SMMEs in Durban in terms of their attitude towards environmental training? (Tick answer/s ✓)

Proactive	Reactive	Increasing interest	Change resistant	Poor interest	Knowledge lacking

2. Is Environmental Training part of your training curriculum to SMME owners?

   YES NO Sometimes

Please explain if required

3. What are the environmental topics presented in training conducted at your organisation?

4. What is the duration of SMME environmental training programmes offered via your establishment? (tick answer/s ✓)

	YES	Not applicable
1 – 2 days		
2 to 5 days		
Other:Please specify		

5. Is there regular follow up with SMMEs after initial training is provided by the your establishment ? YES NO Sometimes

Explain further if required.

6. Does the eThekwini SMME unit encourage SMMEs to secure future environmental training services as per the SMMEs business operation needs?
YES NO Sometimes

Please explain

7. Which of the following environmental issues are:	Considered in our Environmental Training.	Currently not done but is needed.	No –it's not considered or needed
Hazardous Chemicals			
Emission Permits & Limits			
Accident/Spillage Mitigation			
Water use and conservation			
Waste recycling, reuse and reduction strategies			
Energy efficiency			
Supply Chain eco- efficiency			
Production and manufacturing eco-efficiency			
Environmental Sustainability Best Practice in Business			
General Environmental Awareness			
Environmental Legal Liability & Risk Management			
Environmental Management Systems such as ISO 14001			
Environmental Performance Systems Training			
SHE Induction			
EIA and Auditing methodologies			
Other - please specify			

8. Apart from training are there any other methods of environmental information sharing practiced by your establishment to SMME trainees?(tick answer ✓)

	Pamphlets	Online links or information	Environmental Awareness Handbooks	Seminars or Workshops
Most Often Used				
Never Used				
Sometimes Used				
Other: Please specify?				

SECTION D

1. What are the possible limitations to environmental training in SMMEs? (Tick answer ✓)	Agree	Strongly Agree	Disagree	Strongly Disagree
High costs				
Requires expert knowledge				
Unclear Environmental Training Criteria & Standards				
Time consuming				
Difficulty in evaluating the outcomes				
Determining relevance to business				
Too technical to understand				
Lack of organisational learning culture				
Poor SMME Owner Commitment				
Other - please specify				

Tick answer ✓A: Agree SA: Stongly Agree D: Disagree SD:Strongly Disagree

2. Would the following be considered as effective outcomes of environmental training to SMME owners? (tick answer ✓)	A	SA	D	SD
Creating an environmentally aware business culture				
Increasing staff competency that effect sound environmental considerations in business decisions				
Innovation and positive change in the direction of environmental stewardship and product development				
Changing staff attitudes towards environmentally sound business practices				
Creating a green and eco-friendly business image				
Creating and marking out a competitive advantage in your market segment				
Operational and Production efficiency				
Business and operational Risk Reduction				
Reduced Environmental Impact				
Other:				

SECTION E

1. Going forward, is there a need for inter-SMME business co-ordination and communication regarding environmental training and sustainability issues?

Please explain

2. Is there are need for greater clarity regarding environmental training standards and criteria for SMME owners? YES NO

Please explain

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3. The perceptions of company management & relevant role players as to the relevance of ETA as a driver for effective environmental management and innovation
4. Develop a set of ETA principles to evaluate the ETA practices

You have been chosen to participate in this project based on:

1. You form part of identified key informants that represent relevant experiences of organisational learning in terms of conducting Environmental Training and Awareness in Durban based businesses. Your response will aid a greater understanding of ETA practices in Durban specifically on environmental knowledge, attitudes, culture and effectiveness in the workplace.

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SIGNATURE OF PARTICIPANT ……

ENVIRONMENTAL TRAINER QUESTIONNAIRE

The aim of this research study is to review the environmental training and awareness practices within selected Durban businesses.

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For purposes of feedback on this research, please provide the following:

Email:_____

Telephone:_____

SECTION A

Sample description

Please state your profession:

Age :

Are you: MALE FEMALE

Company Name/Employer:

Number of Staff at company/branch:

Duration of employment at current company:

Your highest educational qualification:

Primary School	High School	Diploma	Degree
Honours	Masters	PhD	Other:_____

SECTION B

1. What is your perceived understanding for the demand of environmental training within Durban businesses? (Tick answer/s ✓)

   Poor Good Excellent Unsure

   How many companies have appointed your services for environmental training in the last financial year? (Tick answer/s ✓) 10 -30 30 – 50 Over 50

   Do you forecast an increase in demand from the same companies and/or new companies? YES NO

2. Is there greater demand from ISO 14001 certified companies than non-certified companies? YES NO

3. What percentage of your environmental services is to ISO14001 companies?

4. What is the frequency of environmental training demand from the various sectors of business in Durban in your experience?	n/a	Sometimes	Frequently	Rarely
Manufacturing				
Financial Services				
Retail Industry				
Corporate and IT services				

Construction				
Light Industry				
Heavy Industry				
Transportation				
Telecommunications				
Other, Please specify				

5. What is your perception of the companies in Durban in terms of their attitude towards environmental training? (Tick answer/s ✓)

Proactive	Reactive	Increasing interest	Change resistant	Poor interest	Knowledge lacking

6. What is the perceived extent of top management commitment to environmental training? (Tick answer/s ✓)

Poor Good Excellent Improving

7. In your training experience which level of company structure is represented in attendance at environmental courses	Frequently Attends	Rarely Attends	Never Attends	Increasing Attendance	N/A
Board of Directors					
CEO					
CFO					
Senior Managers					
Junior Managers					
Supervisors					
Office/Admin Staff					
Factory Staff					
Temporary Workers					
Contractors					

1. In your experience how are environmental training courses conducted in relation to other training needs?

	YES	NO	SOMETIMES
a. Part of SHEQ training			
b. Integrated with other training			
c. Part of induction			

training			
d. Part of Environmental Health training			
e. As a separate course			

8. What are the most common training methods employed per company tier in your experience?

Training methods per employee tier	Workshops	Lectures	Publications	Videos	On-site training	Field trips	Online/ computerised courses	N/A
Board of Directors								
CEO								
CFO								
Senior Managers								
Junior Managers								
Supervisors								
Office/Admin Staff								
Factory Staff								
Temporary Workers								
Contractors								

9. What are the most frequently requested and presented environmental courses your company offers to Durban businesses?

10. Which of the following environmental issues are:	Yes, it's considered in our Environmental Training.	Currently not done but is needed.	No –it's not considered or needed
Hazardous Chemicals			
Emission Permits & Limits			
Accident/Spillage Mitigation			
Water use and conservation			
Waste recycling, reuse and reduction strategies			
Energy efficiency			
Supply Chain eco- efficiency			
Production and manufacturing eco-efficiency			
Environmental Sustainability Best Practice in Business			
General Environmental Awareness			
Environmental Legal Liability & Risk Management			
Environmental Performance Systems Training			
SHE Induction			
EIA and Auditing methodologies			
Other - please specify			

SECTION C

1. Is evaluation mandatory on your environmental courses? YES NO Sometimes
   a. If not, please explain?

b. When evaluation is required, what are the different types of evaluation methods used?

SECTION D

1. Is environmental training an effective tool to improving environmental performance in companies? YES NO

2. How effective is ETA in achieving the following:

	Agree	Strongly Agree	Disagree	Stongly Disagree
Creating an environmentally aware corporate culture				
Increasing staff competency that effect sound environmental considerations in business decisions				
Innovation and positive change in the direction of environmental stewardship and product development				
Changing staff attitudes towards environmentally sound business practices				
Creating a green and eco-friendly corporate image				
Creating and marking out a competitive advantage in your market segment				
Operational and Production efficiency				
Business and operational Risk Reduction				
Improving the effectiveness of company EMS				
Enable greater understanding of business environmental impacts and how such impacts can be eliminated or mitigated				
Improved compliance to legal and industry standards				
Adhering to Group environmental requirements				
Company Governance commitment				

3. Going forward is there a perceived need for inter-industry co-ordination and communication in the area of environmental training? YES NO

Please explain?

4. Are greater environmental training standards and criteria needed for Durban businesses?

YES NO

Please explain

5. What are the possible impediments to conducting ETA in the workplace? (Tick answer/s ✓)	Agree	Strongly Agree	Disagree	Strongly Disagree
Too expensive				
Requires expert knowledge				
Time consuming				
Environmental Training Standards & Criteria				
Difficulty in evaluating the output				
Determining Relevance to business				
Too technical to understand				
Lack of organisational learning culture				
Poor Management commitment				
Other - please specify				

THANK YOU FOR YOUR TIME & EFFORT IN COMPLETING THIS QUESTIONNAIRE!