Development of an environmental reporting framework for the industrial sector in Tanzania

by

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SUMMARY

The purpose of this study was to develop an environmental reporting framework for the Tanzanian industrial sector. To achieve the purpose, the study started by developing a disclosure index, which was used to measure the current extent of environmental reporting in Tanzania. There were two phases in the process of developing the environmental disclosure index (EDI) for the Tanzanian industrial sector.

The first phase involved identifying and refining the items for disclosure from the literature. In particular the studies on environmental reporting/disclosure were reviewed and the items to be included in the initial disclosure index were identified. The second phase involved the development of the final disclosure index using the Delphi inquiry method. In the Delphi inquiry, knowledgeable experts in environmental issues were consulted and asked for their opinion on the items proposed, whether the item should be retained, removed or any addition of new item. Therefore, the role of the experts was, first to confirm and validate items to be included in the EDI, and second, to assess the importance of the disclosure of each item by allocating weight to every item.

The extent of environmental reporting in Tanzania was measured by using the EDI developed. The annual and environmental reports from various organisations operating in Tanzania were requested and read to determine the current extent of environmental reporting. The results indicated that the information reported by organisations operating in Tanzania mostly came from the categories 'Organisational context' and 'Management performance, policies and systems. The information from 'environmental performance' category was left unreported.

After the current extent of environmental reporting has been explored, the environmental reporting framework (ERF) was developed. The framework intended to provide guidance on environmental reporting to organisations (from the industrial sector) of any size operating in the country. In particular the framework provided the guidance on four steps to be followed when preparing environmental reports and the content to be included in the reports.

After the ERF was developed, it was tested to investigate its applicability using two case studies. The results indicated that the steps to be followed when preparing environmental reports were valid and implementable.

Key words: Environmental reporting, environmental reporting framework disclosure index, industrial sector, Tanzania.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACCA	Association of Chartered Certified Accountants
AIMR	Association of Investment Management and Research
ASM	artisanal and small-scale miners
ASX	Australian Securities Exchange
BIS	basic industrial strategy
BMP	biodiversity management plan
BRELA	Business Registration and Licensing Agency
CAG	Controller and Auditor General
CDP	Carbon Disclosure Project
CEO	chief executive officer
CEPA	Canadian Environmental Protection
CERES	Coalition for Environmentally Responsible Economies
CRC	Carbon Reduction Commitment
CSA	Canadian Standards Association
CSR	corporate social responsibility
CTI	Confederation of Tanzania Industries
DEFRA	Department for Environment, Food and Rural Affairs
DMA	disclosure on management approach
DSE	Dar es Salaam Stock Exchange
EDI	environmental disclosure index
EHS	Environmental, Health and Safety
EIA	environmental impact assessment

EMA	Environmental Management Act
EMCA	Environmental Management and Co-ordination Act
EMP	environmental management programmes
EMS	environmental management system
EPA	Environmental Protection Agency
ERF	environmental reporting framework
ERS	export rebate system
EWURA	Energy and Water Utility Regulatory Authority
FDI	foreign direct investment
FRC	Financial Reporting Council
FSRA	Financial Services Reform Act
FYDP	five-year development plan
GCLA	Government Chemist Laboratory Authority
GDP	gross domestic product
GGM	Geita Gold Mining
GHG	greenhouse gas
GHGR	Greenhouse Gas Rule
GJ	gigajoules
GOPs	good operating practice
GovHK	government of Hong Kong
GRI	Global Reporting Initiative
GRS	general retention scheme
GWh	gigawatt hour
HFO	heavy fuel oil

HIV/AIDS	human immunodeficiency virus/acquired immunodeficiency syndrome
HSE	Health, Safety and Environment
IAS	International Accounting Standards
IASB	International Accounting Standard Board
ICOLD	International Commission on Large Dams
IFC	International Finance Corporation
IFRS	International Financial Reporting Standard
IIDS 2025	Integrated Industrial Development Strategy 2025
IIRC	International Integrated Reporting Council
ISO	International Standardization Organization
JSE	Johannesburg Stock Exchange
KPI	key performance indicator
KSI	key sustainability indicator
KWh	kilowatt hour
LSM	large-scale miners
LTPP	long-term perspective plan
MJ	megajoule
MWh	megawatt hour
NBAA	National Board of Accountancy and Auditors
NEMA	National Environment Management Authority
NEMC	National Environmental Management Council
NEP	National Environment Policy
NGO	non-governmental organisation

NOSA	National Occupational Safety Association
NPRI	National Pollutant Release Inventory
NSE	Nairobi Stock Exchange
NSGRP	National Strategy for Growth and Poverty Reduction
OHSAS	Occupational Health and Safety Assessment Series
OHSMS	Occupational Health and Safety Management System
OSHA	Occupational Safety and Health Authority
PER	public environmental reporting
REMA	Rwanda Environmental Management Authority
S/N	serial number
SA	South African
SASRI	South African Sugarcane Research Institute
SBT	Sugar Board of Tanzania
SEDI	Social and Environmental Disclosure Index
SEZ	Special Economic Zone
SIDO	Small Industries Development Organisation
SIDP	Sustainable Industrial Development Policy
SLA	service-level agreement
SMEs	small and medium-sized enterprises
STAMICO	State Mining Corporation
SSE	Shanghai Stock Exchange
TANESCO	Tanzania Electric Supply Company Limited
TBL	Tanzania Breweries Limited
TBS	Tanzania Bureau of Standards

TCB	Tanzania Cotton Board
TCU	Tanzania Commission for Universities
TDU	Textile Development Unit
TEEB	The Economics of Ecosystems and Biodiversity
TFDA	Tanzania Food and Drug Authority
TIC	Tanzania Investment Centre
TMAA	Tanzania Mineral Audit Agency
TMTP	Tanzania min-tiger plan
TPDC	Tanzania Petroleum Development Corporation
TRA	Tanzania Revenue Authority
TRI	Toxic Release Inventory
TSF	Tailings Storage Facility
TZS	Tanzania Shillings
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
URT	United Republic of Tanzania
US	United States
USE	Uganda Stock Exchange
VETA	Vocational Education and Training Authority
VPO	Voyager Plant Optimisation
WBCSD	World Business Council for Sustainable Development

WCED	World Commission on Environment and Development
WRI	World Resource Institute

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DECLARATION

I, Jema Edmund Myava, declare that “DEVELOPMENT OF AN ENVIRONMENTAL REPORTING FRAMEWORK FOR THE INDUSTRIAL SECTOR IN TANZANIA” is my own work and that all sources I have used or quoted have been indicated and acknowledged by means of a complete list of references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

ABSTRACT

This study emanated from the accounting discipline and intended to enhance the environmental reporting to organisations operating in Tanzania. Therefore, the aim of the study was to develop an environmental reporting framework for the Tanzanian industrial sector. To achieve this aim, the study started by developing an environmental disclosure index, which was used to measure the current extent of environmental reporting in Tanzania. Thereafter an environmental reporting framework was developed following a case study involving the industrial sector to determine the applicability of such framework.

In developing the environmental disclosure index, the Delphi inquiry technique was employed whereby selected experts had a role, first to confirm and validate the items to be included in the disclosure index, and second, to allocate weight to every item based on its importance. The results in terms of the extent of environmental reporting revealed that the environmental information reported by organisations operating in Tanzania came mostly from the categories 'Organisational context' and 'Management performance, policies and systems'.

The framework that was developed provides the guidance on four steps to be followed when preparing environmental reports and the content to be included in the reports, namely identifying the environmental aspects and impact, developing environmental performance indicators, setting objectives and targets and measuring, evaluating and reporting environmental information. Furthermore, when reporting environmental information, the framework requires organisations to classify environmental information in three categories, i.e. 'Organisational context', 'Management performance, policies and systems' and 'Environmental performance'.

The results for the case study showed that the steps to be followed when preparing environmental reports were valid and implementable. The proposed steps are normally followed by organisations who wish to protect the environment. Similarly, the results indicated that almost all items proposed to be included in reports by organisations is already available.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Environmental reporting refers to different means by which organisations disclose information about their environmental activities (Zeng, Xu, Dong & Tam 2010:1142). Specifically, environmental reporting means incorporating environmental information, such as environmental risks, impacts, policies, strategies, targets, cost and liabilities, in the annual report or other reports of the organisation to users (Sen, Mukherjee & Pattanayak 2011:139). Ali and Abdelfettah (2017:490) refer to environmental reporting practices as a process of communicating to shareholders beyond financial reporting by incorporating environmental impacts of the organisation. Annual reports, stand-alone corporate environmental reports, an environmental statement or some other media, such as videos and websites, have been used as a media to convey this information (He & Loftus 2014:145; Pahuja 2009:227).

The increase in environmental reporting by organisations have been stimulated by the increase in awareness of the global concern regarding the environment (AbuRaya 2012:2; Ali & Abdelfettah 2017:490; Cowan 2007:4; Mishra & Suar 2013:44; Pahuja 2009:227). The literature suggests that environmental reporting started between the 1960s and 1970s (Cowan 2007:16; Eugenio 2009:3; Goyal 2013:50; Pramanik, Shil & Das 2008:146). The early global initiatives in terms of environmental protection and sustainability include the establishment of the United Nations Environment Programme (UNEP) and the World Commission on Environment and Development (WCED) known as the Brundtland Commission (WCED 1987). Others are the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in 1992, which devised strategies to halt and reverse the negative effect of human activities on the environment and promote sustainable development (Pramanik *et al.* 2008:146). During this conference, the role of corporate entities in respect of overall

management of the environment was properly recognised (Pramanik *et al.* 2008:146).

Since 1992, numerous countries, including Tanzania, made a declaration to abide by the principles of sustainable development (Pallangyo 2007:28) by introducing laws and regulations relating to environmental protection (Mishra & Suar 2013:55). The declarations made by various countries to abide by the principle of sustainable development, could be a reason for organisations to improve environmental reporting in both developed and developing countries. Despite the commitment to abide by the principles of sustainable development, most of the developing African countries lag in sustainability reporting in comparison to the rest of the world (Schieler 2016:2). To date, most of the stock exchanges around the world require their listed organisations to report on selected environmental and social indicators or explain why they do not (Hardcaste 2014; KPMG, Global Reporting Initiative [GRI] & United Nations Environment Programme [UNEP] 2013).

Tanzania, as a developing country, is still attracting a number of investors in both existing and emerging industries. Some of the emerging industries are mining and mineral processing and gas and petroleum refining. Research conducted in Tanzania indicated substantial adverse environmental effects, such as water pollution and land degradation caused by industrial activities (Lauwo & Otusanya 2014:97; Maliganya, Simon & Paul 2013:5). However, the level of environmental reporting is inadequate, and this questions the commitment by the Tanzanian government to ensure accountability and transparency by organisations operating in the country (Curtis & Lissu 2008:42; Lauwo & Otusanya 2014:104).

More effort is required to ensure that the organisations operating in Tanzania commit to sustainable development and environmental protection in their business strategies. Among the commitments could be the disclosure of environmental information, such as the environmental impact arising from business operational activities, environmental lawsuits, and related pollution

compensation and the environmental policies (Zhongfu, Jianhui & Pinglin 2011:1219). The present research was motivated by a concern for accountability and transparency in terms of environmental issues for sustainable development, hence the desire to use the accounting discipline to improve the condition of the social system.

1.2 STATEMENT OF THE RESEARCH PROBLEM

The increase in human activities, which affect the environment, in particular business activities, has led to greater awareness of environmental issues among people globally (Daizy & Das 2014:56; Elijido-Ten 2004:3; Kabir & Akinnusi 2012:156). People now demand organisations to furnish environmental information in order to understand to what extent the organisation is committed to protect the environment in which it operates (Khan, Halabi & Samy 2009:344). As a result, organisations started to furnish environmental information; however, some organisations have been challenged for doing 'window dressing' by disclosing something totally different to what they actually do (Magness 2006:544). Likewise, despite an increase in environmental reporting, various studies indicate that the information reported is incomplete, ad hoc in nature, in no specific format, mostly qualitative, and it provides inadequate disclosure for most of the environmental themes, and only positive or neutral news is reported (bin Abd. Rahman, binti Yusoff & binti Wan Mohamed 2009:16; Sen *et al.* 2011:153; Uwuigbe & Jimoh 2012:79).

In the same way, the presence of a growing awareness of environmental issues among people globally has influenced various governments around the world, especially from the developed countries, to engage in protection of the environment (KPMG, GRI & UNEP 2013:10; UNEP & KPMG 2006:6). Various interventions have been designed to ensure that all businesses are conducted in a sustainable way. For example, countries such as the United Kingdom (UK), France, the United States (US), South Africa, Australia and Norway, have introduced laws and regulations that require organisations operating in their

jurisdictions to provide environmental information in their annual reports or in separate reports (KPMG *et al.* 2013). In addition, most of the stock exchanges around the world (for instance the Shanghai Stock Exchange, the Johannesburg Stock Exchange and the London Stock Exchange) require listed organisations to provide environmental information in their annual reports (Hardcaste 2014; KPMG *et al.* 2013).

Moreover, to ensure that the environmental information reported is complete and deliver its intended aims, various frameworks have been developed to date to assist organisations in the reporting process. The most used framework worldwide is the GRI framework (Daizy & Das 2014:61). Some countries have developed their own frameworks to cater for their various requirements. For instance, the Department for Environment, Food and Rural Affairs (DEFRA) in the United Kingdom developed a guideline to assist organisations complying with greenhouse gas reporting, which is a requirement in terms of the Climate Change Act of 2008 (DEFRA 2013).

The International Integrated Reporting Council (IIRC) on the other hand, is involved in encouraging organisations to shift from traditional reporting (where only financial information is reported) to integrated reporting (where governance, social environmental and financial information) are reported in a single document (IIRC 2013). Integrated reporting intends to present to users how organisations create and maintain value, taking into consideration economic, social and environmental factors (Eccles & Saltzman 2011:59). Integrated reporting does not intend to substitute traditional reporting with another form of reporting, instead it wants to enable the preparers of the integrated report to use information from various already available sources to explain the key drivers of their businesses value (Association of Chartered Certified Accountants [ACCA], 2015). Various countries such as South Africa, the Netherlands, Brazil, the United Kingdom, Germany, Denmark and Finland are now preparing integrated reports (Ernst & Young [EY], 2014:8).

Despite the initiative taken by various countries around the world to ensure their businesses report environmental information, little effort has been made by the Tanzanian government. Generally, the Tanzanian industrial sector has passed through various phases of development to date. However, when the country moved from a state-owned to privately owned economy in 1995 the government put little emphasis on environmental responsibilities by the organisations investing in Tanzania. The possible reason could be that the government aimed to attract more investors into the country (Lauwo & Otusanya 2014:101). Later on, the country had set some initiatives, such as the introduction of the National Environment Policy (NEP) in 1997 (see United Republic of Tanzania [URT], 1997) and the Environmental Management Act No. 20 of 2004 (EMA) (see URT 2004) and its regulations in 2004 to ensure that the environment is protected. To date, a number of legislations with environmental safeguards exist. Some are specific to the sector and others are cross-cutting (applicable to more than one sector). Despite having a variety of requirements and compliances on a range of issues, and the current policy of industrialisation, still no requirement (regulation) on environmental reporting is available.

Environmental reporting in Tanzania is carried out voluntarily. It is therefore expected that these requirements and compliance with Acts and regulations available would work effectively for the Tanzanian industrial sector if there could be requirements for reporting and guidelines to guide organisations in preparing and reporting issues related to the environment. Therefore, this research sought to address this problem by developing an environmental reporting framework that could be used by the industrial sector to report environmental information.

1.3 RESEARCH OBJECTIVES

This research aimed to develop an environmental reporting framework that could be used by the industrial sector in reporting environmental issues in Tanzania. The key objectives of this research were to:

1. develop a disclosure index to measure the current extent of environmental reporting in the industrial sector of Tanzania;
2. develop a framework to guide environmental reporting in the industrial sector of Tanzania; and
3. investigate the current feasibility and applicability of applying the reporting framework in the industrial sector of Tanzania.

In order to achieve the above objectives, the following research questions were employed to guide the research design, the data collection process and the data analysis:

1. Which environmental information do stakeholders require, and how is the information need currently being met?
2. Which instrument can the industrial sector use to report environmental information, and how should the information be reported?
3. What is the applicability of an environmental reporting framework in the industrial sector of Tanzania?

1.4 SIGNIFICANCE OF THE STUDY

The findings of this study will contribute to the academic literature regarding the environmental reporting practice in Tanzania. The environmental reporting framework that was developed is a scientifically developed framework on environmental reporting not only for Tanzania but also for the whole East African region. In particular, the framework will provide guidance to preparers of environmental reports in terms of which information should be included in the report and how it should be presented. The framework will also facilitate reporting by providing information, which is reliable, relevant and of interest to its stakeholders. In addition, the framework will ensure that an organisation prepares environmental reports that will enable stakeholders to compare and evaluate the environmental performance between organisations or the environmental performance of an organisation over time.

Moreover, the National Board of Accountant and Auditors (NBAA) and the Dar es Salaam Stock Exchange (DSE) could recommend the framework to organisations in need of preparing environmental reports. Likewise, the results of this study will potentially provide a new policy platform in terms of whether environmental reporting should continue to be non-mandatory or not.

Furthermore, the proposed framework will be in line with and will follow the principles of environmental reporting component of the framework for Integrated reporting. The Framework for Integrated Reporting requires organisations to communicate information on how they are creating value over time (International Integrated Reporting Council [IIRC], 2013:2). Therefore, the framework developed for the present study will assist organisations operating in Tanzania to prepare reports, which are in line with the integrated reporting requirement.

1.5 RESEARCH METHODOLOGY

This research adopted a mixed research method approach within the pragmatism theory. The mixed research method approach supported the development of the environmental reporting framework in different ways. Firstly, the study started by developing a disclosure index that was used to determine the extent of environmental reporting by the Tanzanian industrial sector. In the process of developing the disclosure index, the Delphi inquiry method (see Hsu & Sandford 2007; Linstone & Turoff 2002) was employed. In the Delphi inquiry method, knowledgeable experts are consulted to give their view or opinion on the issue at hand (Worrell, Di Gangi & Bush 2013:194). The experts' feelings and perceptions about the disclosure items were an important part of preparation of the framework. Therefore, the initial disclosure index was developed and sent to the experts to obtain their views and opinions on the proposed items and whether the items should be reported or not. They were further requested to add any item they felt was important to be reported but which was not included in the list. At that stage, the required information was collected qualitatively.

After obtaining the stakeholders' opinions, it was important to perform quantitative weighting of the proposed disclosure items in order to determine their level of importance. The experts were requested to rate the items in the disclosure index according to their importance, using a five-point Likert-type scale. Hence, the importance of each item was determined quantitatively. The weight of the items in the disclosure index was calculated by adding the weight allocated by each expert and then divided by the total number of experts who responded to the particular item.

Thirdly, the extent of environmental reporting in Tanzania was determined by content analysis of the relevant organisations' annual and environmental reports using the disclosure index that had been developed during the research. The content analysis technique comprises a set of procedures that transfer non-structured information into a form that allows analysis to be conducted (United States General Accounting Office 1989:6). The technique was adopted because it is one of the most systematic, objective and quantitative methods of data analysis in corporate environmental disclosure practices (Deegan & Gordon 1996:189; Hughes, Anderson & Golden 2001:225; Uwuigbe & Jimoh 2012:75; Wiseman 1982:55). Therefore, the qualitative information in the annual and environmental reports was coded and analysed quantitatively. In addition, the disclosure index was used as the basis for the development of the environmental reporting framework.

Finally, a case study of two organisations was conducted to confirm the feasibility and applicability of applying the reporting framework in the Tanzanian industrial sector.

1.6 SCOPE AND LIMITATION

This research involved organisations, which operated in the industrial sector of Tanzania at the time of the research. In determining the extent of environmental reporting, content analysis was limited only to organisations whose activities were considered as having a high level of impact on the environment. The

organisations whose activities had a low level of environmental impact, such as banks were excluded from the study.

The content analysis was used to measure the reporting of certain environment-related items against a disclosure index, which incorporated stakeholder opinions on the importance of environmental reporting rather than to determine the level of compliance with environment-related legislation if any.

The purpose of the case studies of organisations in the present study is to gain a deeper understanding of the issues surrounding environmental reporting in a 'real-world' setting. It does not attempt to produce an environmental report, but rather wants to investigate the current barriers, restrictions and difficulties in implementing a reporting framework. The present case study aimed to provide the foundation for further research on environmental reporting in the industrial sector. In the present research, the testing of the reporting framework was done by way of a detailed case study on two organisations.

It is known that one of the weaknesses of case study research is that the research results and conclusions are subject to the researcher's interpretation (Ryan, Scapens & Theobald 2002:155; Salkind 2006:206). A further limitation of case study research is that the results cannot be generalised (Ryan *et al.* 2002:155; Salkind 2006:206). However, to gain a deeper understanding of a phenomenon, case study research is vital. Despite the limitations of the case study method, its use in investigating applicability and feasibility of the framework developed during the present research provided a deep understanding of the practical issues faced by industries in Tanzania.

1.7 OUTLINE OF CHAPTERS

The rest of the chapters comprises the following:

CHAPTER 2: LITERATURE REVIEW

This chapter provides an overview of the emergence and development of environmental reporting and the accounting discipline. Issues related to

voluntary disclosures, initiatives designed to promote environmental reporting, integrated reporting, environmental reporting frameworks, the International Accounting Standards (IAS) and the International Financial Reporting Standards (IFRS) and environmental reporting are also reviewed and presented in this chapter.

CHAPTER 3: OVERVIEW OF INDUSTRIAL SECTOR AND ENVIRONMENTAL MANAGEMENT IN TANZANIA

The chapter describes the industrial sector and environmental management in the context of Tanzania. It provides the history of the Tanzanian industrial sector and the way the issues related to environment are managed. The policy and legal framework for environmental management in Tanzania are presented. Lastly, the chapter explains the production processes from various industries operating in Tanzania. Each process together with its potential environmental impact is discussed. The aim is to point out the intensity of the environmental impact caused by each sector in the country

CHAPTER 4: THEORETICAL FRAMEWORK

Various theoretical perspectives employed in existing literature to describe, explain and evaluate the environmental reporting practices are presented in this chapter. The chapter starts by providing a general overview of the theories of corporate environmental disclosure. This is followed by a detailed discussion of theories used in social accounting, namely political, legitimacy, stakeholders and institution theories.

CHAPTER 5: RESEARCH DESIGN

This chapter outlines the methodology and methods used in this research. A philosophical discussion of the chosen research paradigm and its selection justification is provided. A detailed discussion of the process and method used in the development of the environmental disclosure index together with its validity is provided. Furthermore, the chapter provides explanations on how the extent

of environmental reporting is determined. The chapter also provides substantiation for using content analysis as a method of assessing the extent of environmental reporting. The chapter continues with an explanation of the coding process and its reliability. The chapter also provides explanations of the sample selection process (i.e. the organisations included when determining the extent of environmental reporting in Tanzania). Finally, the chapter discusses the way the environmental reporting framework was developed and how it was tested.

CHAPTER 6: DEVELOPMENT OF ENVIRONMENTAL DISCLOSURE INDEX

This chapter focuses on the development of the environmental disclosure index. The chapter presents a discussion and explanation of various issues, which arose during the process of developing the environmental disclosure index. It also discusses the individual proposed items in the initial disclosure index and the revised index together with agreement attained by experts. Finally, the disclosure index and the weight assigned by the experts are presented.

CHAPTER 7: EXTENT OF ENVIRONMENTAL REPORTING IN TANZANIA

The chapter presents the results in terms of the extent of environmental reporting in Tanzania. It presents a discussion on the organisations, which participated in the study. This is followed by a discussion of how the environmental information was extracted from annual reports and/or environmental reports. Finally, the chapter presents the results in terms of the extent of environmental reporting in Tanzania.

CHAPTER 8: THE DEVELOPMENT OF AN ENVIRONMENTAL REPORTING FRAMEWORK

In this chapter, the development of the environmental reporting framework is presented. The chapter starts by explaining the beneficiaries (i.e. to whom does the framework apply) of the framework and the principles to be followed when collecting and reporting environmental information. The chapter further links the

results of the previous chapters and presents the steps to be followed when preparing environmental reports. Finally, it presents the list of items to be included when preparing environmental reports

CHAPTER 9: CASE STUDY OF INDUSTRIAL SECTOR

This chapter presents the case study of two organisations, namely Geita Gold Mining (GGM) and Tanzania Breweries Limited (TBL) Arusha branch. The background information on the selected organisations is presented followed by a discussion of the procedures followed when testing the framework. Finally, the results for GGM and TBL are presented, followed by a discussion of the results.

CHAPTER 10: SUMMARY, CONCLUSIONS AND FUTURE RESEARCH

This chapter summarises the research findings and concludes the study. The chapter conclude with recommendations for further research.

The next chapter presents a review of the literature. The chapter starts by providing the emergence and evolution of environmental reporting in the accounting discipline.

CHAPTER 2

LITERATURE REVIEW`

2.1 INTRODUCTION

This study emanated from the accounting discipline and intends to enhance the environmental reporting of organisations operating in Tanzania. Therefore, this chapter provides an overview of environmental reporting. The chapter starts by exploring the emergence of environmental reporting, where the literature indicates that the movement regarding environmental issues started in the early 1970s (see Cowan 2007) when the first conference related to environmental protection was held in Stockholm (see Pramanik *et al*. 2008). To date, various conferences on environmental protection have been convened and varieties of treaties have been agreed by different governments.

The chapter also points out various reasons for an increase in environmental reporting and the benefits received from reporting such information. The hurdles encountered by organisations when reporting environmental information are also discussed, as well as the media used to convey environmental information such as annual reports, websites, stand-alone reports and newsletters. The reasons for organisations to report environmental information voluntarily are presented.

Various initiatives by various governments, both from developed and developing countries, to ensure that the businesses operating in their countries are sustainably operating are also presented. The discussion covers the initiatives taken by the United Kingdom, Australia, the United States, Canada, China, France, the Netherlands, South Africa and East African countries.

The issue of integrated reporting is also discussed. The current move is to shift from traditional reporting (which emphasises financial information reporting) to integrated reporting (which integrates both financial and non-financial information in a single report). The aim of preparing an integrated report is to

show how organisations create value over time. Detailed information regarding integrated reporting is provided in this chapter.

Similarly, various environmental reporting frameworks have been reviewed to determine the emphasis regarding environmental issues in each framework where possible to borrow some ideas that could work in the Tanzanian context. Lastly, various International Accounting Standards and International Financial Reporting Standards related to environmental issues are reviewed.

The chapter thus covers, among others, the emergence and evolution of environmental reporting, voluntary disclosures, integrated reporting, IAS/IFRS and environmental reporting, initiatives designed to promote environmental reporting and environmental reporting frameworks.

2.2 EMERGENCE AND EVOLUTION OF ENVIRONMENTAL REPORTING

The literature suggests that environmental reporting started between the 1960s and 1970s (Cowan 2007:16; Eugenio 2009:3). The earliest movement started in 1972 when the United Nations General Assembly decided to convene the Stockholm Conference in Sweden. The focus of the conference was human interaction with the environment, and 26 principles were set to guide people of the world in the preservation and enhancement of the human environment (Pramanik *et al*. 2008:146). As a result, the United Nations Environment Programme (UNEP) was established. Among others, the purpose of UNEP was to encourage United Nations (UN) agencies to integrate environmental issues into their programmes. In the mid-eighties, the WCED, well-known as the Brundtland Commission, was launched by the United Nations (Pramanik *et al*. 2008:146).

The commission was given the task of looking at the consequences caused by interactions between humans, the environment, natural resources and economic and social development. In 1987, the Brundtland Commission prepared a report called “Our common future” (see WCED 1987) with the proposed idea of sustainable development, “the development that meets the need of the present

without compromising the ability of future generations to meet their own needs" (WCED 1987). After the Brundtland Report, the United Nations Conference on Environment and Development (UNCED), also referred to as 'the Earth Summit', was held in Rio de Janeiro in 1992 (Pramanik *et al*. 2008:146). The purposes of the conference were to lay a foundation on how the proposal of the Brundtland Report could be achieved and to agree on the main treaties on climate change, biodiversity and forest management (Drexhage & Murphy 2010). Furthermore, the Rio Declaration on Development and Environment ('the Rio Declaration') and Agenda 21 were adopted (Pramanik *et al*. 2008:146). Agenda 21 contains the action plan to be implemented by various nations, governments and major groups in each area where humans affect the environment. At the UNCED conference, the role of business in respect of managing the environment was properly acknowledged (Pramanik *et al.* 2008:146).

Since 1992, numerous countries, including Tanzania, agreed to the Rio Declaration to abide by the principles of sustainable development (Pallangyo 2007:28) by introducing laws and regulations relating to environmental protection (Mishra & Suar 2013:55). The introduction of laws and regulations could be a reason for increased pressure on firms to improve environmental performance reporting in both developed and developing countries. According to Chatterjee and Mir (2008:611), environmental regulations act as a drive for organisations to comply by including information related to environmental issues in their annual reports. However, it is argued that environmental reporting may either aim to comply with the existing regulations or could be a strategy to avoid future regulations (Yusoff, Lehman & Noraini Mohd 2006:127).

Apart from the increase in environmental laws and regulation, various reasons have been given so far for an increase in environmental reporting. For instance, it is being argued that an increase in economic growth and growth in the manufacturing industry creates many significant unfavourable impacts on society and the environment, which in turn leads to increasing demands for corporate accountability in business practices (Elijido-Ten 2004:3; Kabir & Akinnusi

2012:156). Furthermore, the increases in media coverage focused towards the limited natural resources, together with an increase in disasters related to environmental degradation have led businesses to act responsibly for their actions (Branco, Eugenio & Ribeiro 2008:140; Chatterjee & Mir 2008:610; Magness 2006:541; Yusoff *et al.* 2006:310). In such situation, firms may decide to use environmental reporting to influence reaction to an accident that has wide repercussions (Branco *et al*. 2008:136). It is reported that an organisation may decide to use environmental disclosure in order to reduce the legislative requirement (such as compliance requirement) by showing that the organisation is operating in a socially acceptable manner (Magness 2006:543). It is true that the collapse of Highlands Towers in 1993 (see Kazmi, Qasim, Harahap & Baharom 2017) and the widespread haze has increased the importance of environmental protection in Malaysia (Smith, Yahya & Ahmad Marzuki 2007:186). In the same way, organisations operating in the petroleum industry and in many other organisations in sensitive industries have improved and increased the reporting of environmental information after the oil spill in Alaska in 1989 by the sea vessel, Exxon Valdez (Magness 2006:544; Suttipun & Stanton 2012b:100).

Again, the introduction of corporate governance, joint development of environmental reporting guidance between the Malaysian government and ACCA Malaysia and national support for environmental protection, penalties for pollution and requirements imposed on organisations to perform environmental impact assessment (Iatridis 2013:57) accelerated the level of environmental reporting in Malaysia. Likewise, local organisations operating in India were expected to act responsibly towards the environment due to the presence of international organisations that report environmental information (Bowrin 2013:263; Chatterjee & Mir 2008:610). The increase in awareness among various environmental groups of stakeholders (in particular government, non-government organisations [NGOs] and other groups in civil society), and issuance of standards related to environmental disclosure by financial

accounting standard bodies are also reasons for environmental reporting (Chatterjee & Mir 2008:612; Yusoff *et al.* 2006:6). Moreover, increased public awareness in Malaysia resulted in an expansion of corporate environmental reporting, and the Malaysian government has increased regulations providing for environmental incentives and rewards, which led to an increase in the existing ISO 14001 organisations (Smith *et al.* 2007:186). Additionally, the increase in environmental reporting by organisations operating in Canada was fuelled by an increase in ethical investment whereby investors prefer to invest in organisations which are socially responsible (Magness 2006:541).

Despite the reasons given for an increase in environmental reporting, there are some circumstances where environmental reporting has been reported to be low. Several reasons have been given to explain the situation. For instance, the presence of small organisations and unlisted organisations, which are unlikely to face demands from stakeholders to adopt corporate social responsibility (CSR), insufficient enforcement of laws and a lack of pressure from stakeholders (Bowrin 2013:260; Liu & Anbumozhi 2009:593) resulted in low reporting.

Numerous benefits have been put forward for reporting social and environmental information, for instance assessing preferred suppliers, increasing the number of customers, building, maintaining or enhancing corporate reputation, and gaining competitive advantages (ACCA 2001:1; Ali & Rizwan 2013:591; Iatridis 2013:59; Kabir & Akinnusi 2012:160). Furthermore, environmental reporting acts as a motive for the organisation to improve its performance continually (bin Abd. Rahman *et al.* 2009:47). For example, it has been argued that a business with a proper environmental management system could offer business incentives by improving its operations, for instance by reducing pollution and waste and by better cost savings, which consequently increases the level of profitability (Yusoff *et al.* 2006:128). In addition, it is been reported that environmental reporting improves the relationship with local communities, regulators and NGOs and increases the confidence of investors, insurers and financial institutions, which could lower the cost of capital and raise the value of stock (Chatterjee & Mir

2008:609; Cormier, Magnan & Van Velthoven 2005:4; Natural Heritage Trust 2000:7). It is further argued that an organisation might incur high costs related to legal requirement and rectification of the environment, or a loss of customer confidence as a result of ignoring environmental issues in its operations (Smith *et al.* 2007:186).

The literature indicates that the factors believed to be most significant for corporate environmental reporting, among others, are the right of investors or shareholders to know information, legal requirements, due diligence requirements, operational improvements of the business, legitimacy pressure, and community concern (Yusoff *et al.* 2006:125). It is further recognised that environmental information has several purposes, such as to –

- measure the impact of social and environmental corporate activities;
- report corporate and environmental responsibilities; and
- measure the effectiveness of corporate, social and environmental programmes (Perry & Sheng 1999:1; Zeng, Xu, Dong & Tam 2010:1142).

However, it is argued that the main motivation for developing countries to take up environmental reporting is to gain corporate reputation, to enjoy tax benefits, and to reduce cost and organisation risks (Ali & Rizwan 2013:591), although for Indian organisations, environmental reporting is done in order to gain legitimacy (Chu, Chatterjee & Brown 2012:117). Malaysian organisations perform environmental reporting mainly to obtain ISO 14001, and to improve their relationships with the local community, suppliers, market authorities and other accounting users (Iatridis 2013:57; Yusoff & Lehman 2006:1). In addition, corporate environmental reporting is done to assist the public in their decision-making, such as investing, consumption, lending and labour supply (Smith *et al.* 2007:186). For investors, extensive environmental reporting will be taken as a positive sign for an organisation that needs to manage its regulation cost, while a lack of extensive environmental reporting will be regarded as a negative sign for future environmental cost.

Despite the motives for and benefits of environmental reporting, there are some hurdles for organisations to report environmental information. For instance, an absence of legal requirements on environmental reporting, a lack of corporate social education for managers, a lack of awareness about environmental issues, a lack of a government reporting framework, a lack of public pressure, and a misconception among organisations about their environmental effect on the environment could hinder the environmental reporting process (Ali & Rizwan 2013:591). Despite the hurdles encountered by organisations, environmental reporting plays an important role in helping nations to establish environmental policies to reach the goal of emission reduction and to build a society of low carbon economy (Zhongfu, Jianhui & Pinglin 2011:1219).

Various media have been used so far for conveying environmental information, for instance stand-alone reports, websites, annual reports, newsletters and other media (Akbas & Canikli 2014:53; Ali & Rizwan 2013:591; bin Abd. Rahman *et al.* 2009:47; Sen *et al.* 2011:140; Sutantoputra, Lindorff & Johnson 2012:53; Suttipun & Stanton 2012b:18). The most famous and commonly used media is the annual report. However, Guthrie, Cuganesan and Ward (2008:33) argue that using the corporate annual report as sole reporting media provides incomplete insights into corporate social disclosure and therefore alternative reporting media may be better sources of such information.

Annual reports are selected as basis for the environmental reporting of an organisation because such reporting is commonly accepted as the major means for an organisation's communication with shareholders and the main source of environmental reporting by an organisation (Smith *et al.* 2007:189; Wiseman 1982:55). It has further been reported that the annual report is a statutory document, which incorporates both voluntary and statutory disclosures, regularly produced, required to be prepared by all organisations, and more easily accessed than other media (Smith *et al.* 2007:189; Suttipun & Stanton 2012a:19; Tilt 2001:193). Moreover, the confidence of users is high because the information is continually audited (Yusoff & Lehman 2006:10). In developing countries, the

annual report is considered the only recognised source of information, although shareholders may access reports and get information by contacting the management of the organisation directly (Shehata 2014:22).

Despite the important role played by the annual report, most organisations have started to use other media, such as their websites and stand-alone reports to convey environmental information to their stakeholders. It is argued that by providing a stand-alone report, the organisation could indicate that it considers CSR as important as financial reporting; hence, focusing on the annual report may lead to an incomplete or incorrect conclusion (Jupe 2007:8; Sen *et al.* 2011:146). In addition, it is argued that both CSR and annual reports are important since stakeholders take into consideration all public reports when making their decisions (Lu & Abeysekera 2014:20). Furthermore, several advantages have been pointed out for publishing environmental information on the website over annual reports. For example, the website can represent current information and can be updated at any time, availability of space is unlimited, it is cost-effective and can be easily accessed (Suttipun & Stanton 2012b:18). Altogether, it is suggested that research examining environmental reporting should look at all disclosures since researchers in this area often use theories that recognise a broad range of stakeholder rights to information (Hooks & van Staden 2011:204).

Despite the increase in environmental reporting, reporting is still done through voluntary initiatives in most countries, and it grows over time (bin Abd. Rahman *et al.* 2009:46; Iatridis 2013:57; Liu & Anbumozhi 2009:593). In Malaysia, for example, environmental issues are voluntarily reported, and there is no legal requirement for listed organisations to report environmental information to the public (bin Abd. Rahman *et al.* 2009:47; Smith *et al.* 2007:186). Similarly, for Indian organisations, environmental reporting is voluntary as there is no guideline relating to environmental accounting apart from little amendments and Acts (Sen *et al.* 2011:140). In the Caribbean, social and environmental reporting is also mainly voluntary or driven by extra-regional forces (Bowrin 2013:260).

However, it is argued that the presence of an environmental policy and commitment to the environment by an organisation indicate the corporate social responsiveness of such organisation (Stanwick & Stanwick 2000:155).

Generally, organisations are expected to disclose important environmental aspects and their impact on the performance of the organisation, material income or expense, risk and uncertainties, significant environmental policies, e.g. emission trading, reporting on greenhouse gases, energy use, waste use, penalties and fines for non-compliance, and environment-friendly capital investment (Chatterjee & Mir 2008:609; Iatridis 2013:56). However, reported information must adhere to accounting principles as prescribed by accounting regulations (Iatridis 2013:56). This discretion of organisations to make environmental disclosure results in some difference in the level and types of such reporting among organisations.

As a result, type and quality of information reported are still under discussion. In a study of corporate environmental disclosure practices in India, it has been found that voluntary environmental disclosures are incomplete, qualitative and provide inadequate disclosure for most of the environmental themes, and only positive or neutral news have been disclosed (Sen *et al.* 2011:153). It is further argued that most of the information is general, narrative, ad hoc in nature, and it has no specific format (bin Abd. Rahman *et al.* 2009:54; Iatridis 2013:57). However, according to Magness (2006:544), the purpose of the disclosures may fail if the information reported by the organisation portrays the true picture regarding performance of the organisation. She further argues that the information supplied to stakeholders is not sufficient for decision-making as well as for evaluating management's fulfilment of its stewardship with regard to environmental resources. She concludes that organisations use disclosure to deceive their stakeholders deliberately.

All in all, organisations have discretion in determining the breadth and depth of their disclosures, and in most cases choose to disclose only favourable

information (Sutantoputra *et al.* 2012:51). This is due to inadequate compulsory reporting regulations in various countries as it is believed that organisations exercise a fair amount of freedom in selecting what to report or not to report (Elijido-Ten 2004:3). It has been suggested that environmental reporting can be improved by introducing reporting standards which various organisations could comply with (Chatterjee & Mir 2008:611). Good environmental reporting may be extremely valued by investors, financial analysts, and market authorities to the level that they are significant and value-relevant (Iatridis 2013:56). Moreover, environmental information presented in numerical form apart from reducing cost related to the environment and cost of capital will also increase regulatory compliance and productivity (Iatridis 2013:56). Therefore, for organisations who provide inadequate environmental information this would imply a rise in political cost, both at local and national level.

The following section provides a deep discussion on the voluntary disclosure. In particular it explains what voluntary disclosure is, and the reasons for increase in voluntary reporting. Further the section explores various studies that have been conducted so far to explain the motives (determinants) of voluntary disclosure as well as how firm-specific characteristic relates to voluntary environmental reporting.

2.3 VOLUNTARY DISCLOSURE

Disclosure and transparency symbolise two of the pillars of corporate governance, which implies that organisations that disclose adequate information are regarded as transparent to their stakeholders. Disclosure can be categorised as mandatory or voluntary but could also be involuntary (i.e. coming from a third party) (Natural Heritage Trust 2000:4). Mandatory disclosure occurs when information reported aim to comply with existing laws and regulations, while voluntary disclosure is when disclosed information is beyond mandatory disclosure (Meek, Roberts & Gray 1995:555). Due to the presence of strong global competition, voluntary disclosure enables emerging markets to compete

in the global market, as mandatory disclosure only covers minimum requirements and thus it needs voluntary disclosure to fulfil the requirements of various users (Al-Janadi, Rahman & Omar 2012:182). Likewise, it has been asserted that voluntary environmental reporting tries to influence stakeholder response to an accident that has industry-wide consequences (Magness 2006:541). For instance, after the Carbide chemical leak in Bhopal India (see Trotter, Day & Love 1989), organisations who supplied more detailed environmental information received less negative market reaction compared to organisations with smaller amounts of disclosure (Blacconiere & Patten 1994:358).

Furthermore, adequate disclosure of information is essential, because without such information, it is not possible to judge the opportunities and risks of investment. Disappointment with compulsory financial reporting by organisations has led financial markets, investors and other stakeholder to insist that organisations disclose more voluntary information about their performance and long-term strategies (Boesso & Kumar 2007:269). The aim of providing voluntary disclosure is to reduce information asymmetry between investors and managers and to clarify long-term business sustainability of various stakeholder groups (Boesso & Kumar 2007:270; Shehata 2014:19). However, for disclosure to be of value, it must reflect actual events described in the disclosure.

Likewise, the increase in voluntary disclosure has been stimulated by the increase in recognition of the stakeholders' approach, which realises that the interaction of an organisation is not restricted to shareholders only (Boesso & Kumar 2007:270), as different stakeholders use disclosure in their decision processes. It is argued that investors need to know the quality of the asset, current and future cash flow so that they may assess the value of the organisation and make an investment decision (Meek *et al.* 1995:555).

Furthermore, voluntary disclosure is influenced by the capital market, where organisations compete in terms of the type of product offered and returns

expected (Shehata 2014:20). It is argued that management will provide information that would minimise the cost of capital. However, managers should trade off the cost of not providing the information to investors against proprietary information cost (Cormier *et al.* 2005:9). It is therefore expected that organisations will provide such voluntary information when the benefits exceed the cost.

2.3.1 Determinants of voluntary disclosure

Various studies have been carried out to determine the motives (determinants) of voluntary disclosure (Burgwal & Vieira 2014; Cormier *et al.* 2005; Elijido-Ten 2004; Hackston & Milne 1996; Jindal & Kumar 2012; Liu & Anbumozhi 2009; Lu & Abeysekera 2014; Souhir & Chedli 2010; Suttipun & Stanton 2012a; Zhang 2013). Cormier *et al.* (2005:4-5), identified the determinants for environmental reporting by organisations, which include public pressure, economic motivation or institutional theory. They explain that managers might disclose information voluntarily to shareholders and debt holders in order to minimise the cost of capital. They further argue that organisations may decide to disclose environmental information for legitimacy purposes as the continued existence of the organisation will depend on how it fulfil the expectations of various stakeholders, such as employees, customers, suppliers, government and the public at large. Cormier *et al.* (2005:5) continue by arguing that organisations may decide to provide environmental information due to the influence of the institutional context of the organisation by considering what other organisations operating in the same industry are doing, or what organisations did in the past, or by looking at the requirements of regulation and laws, which govern the disclosure. Cormier *et al.* (2005:5) argue that all three levels of influence are important in determining the quality of environmental reporting.

Yusoff *et al.* (2006:124) were interested to find the reason that inspired Malaysian organisations to engage in environmental disclosure practices. They argue that organisations could engage in environmental reporting either to improve the

relationship between the stakeholders and the public, or due to internal values of self-awareness on environmental issues. Likewise, Yusoff *et al.* (2006:124) argue that compliance and future regulatory impact could be a reason to engage in environmental reporting, as non-compliance could lead to penalties and litigation. In addition, they claim that organisations may be involved in environmental reporting to raise the financial performance as it is believed that better financial performance will enhance shareholder value of the organisation. They add that some organisations might engage in environmental issues to improve business operations. Yusoff *et al.* (2006:128) conclude that an organisation with proper environmental management system may improve its operations. For instance, reduction of waste and pollutants could result in cost savings, which consequently will increase the profit.

In their study of the drivers of corporate voluntary disclosure, Boesso and Kumar (2007:269) found that the volume and quality of voluntary disclosure are influenced by factors such as the market complexity effect, the relevance of intangible assets, and emphasis on stakeholder management. Furthermore, the findings from the study by Elijido-Ten (2004:2) suggest that the level of awareness/concern on environmental issues by top management and the ability of government to sanction organisations are the main determinants of environmental reporting in Malaysia. However, for Tunisian listed organisations, the factors that fuel the decision to report environmental information are the degree of the organisation's internationalisation, the degree of political visibility, and the debt level of the organisations (Souhir & Chedli 2010:119). Barbu, Dumontier, Feleaga and Feleaga (2014a:4) add that the level of environmental reporting by organisations depends on the setting of the specific country, such as the legal, social, political and cultural environment within which these organisations operate. Thus, for a country with stringent legal requirements, the disclosure will be higher than for a country where the legal requirements are permissive.

2.3.2 Firm-specific characteristic and environmental reporting

In the same way, various studies have been conducted so far to explore the relationship between firm-specific characteristics and the extent of environmental reporting (see for example Filbeck & Gorman 2004; Hackston & Milne 1996; Khondkar, Michael & Robert 2006; Liu & Anbumozhi 2009; Lu & Abeysekera 2014; Pahuja 2009; Smith *et al.* 2007). Characteristics that have been explained to have a strong correlation with environmental reporting are organisation size, industry type within which the organisation operates, and the financial performance of the organisation.

A number of authors argue that the size of the organisation is positively related with the extent of environmental reporting (Al-Tuwaijri, Christensen & Hughes II 2004; Boesso & Kumar 2007; Bowrin 2013; Hackston & Milne 1996; Liu & Anbumozhi 2009; Lu & Abeysekera 2014; Magness 2006; Suttipun & Stanton 2012a; Zhang 2013). Several reasons have been provided to support this association.

Firstly, the environmental reporting process is costly, which means the cost of gathering and generating particular information is greater for small firms than for large firms as small organisations may not be able to pay such costs from their resource base (Bowrin 2013:261; Pahuja 2009:232; Sutantoputra *et al.* 2012:62). This shows that large organisations might have sufficient resources to afford the cost of producing information for users of the annual report. In addition, it has been reported that for large organisations, environmental information is collected for internal reporting and later on used by managers for decision-making; therefore, for large organisations, the information is already available (Pahuja 2009:232).

Secondly, because they undertake more activities, which in most cases have a high level of environmental impact on society, large organisations are usually subjected to public expectations and they are monitored by government authorities. In addition, these organisations usually have more stakeholders than

small organisations (individual and institutional) who are required to be satisfied with information (Boesso & Kumar 2007:277; Liu & Anbumozhi 2009:597). Therefore, these organisations believe that disclosure of environmental information will create confidence among stakeholders and will minimise public criticism and pressure from government. Additionally, it is argued that the agency cost is higher for large organisations than small organisations because shareholders are widespread (Bowrin 2013:261). Therefore, disclosing information reduces the potential agency cost to the organisation (Bowrin 2013:261; Hackston & Milne 1996:81; Khondkar *et al.* 2006:86).

Thirdly, large organisations depend on capital markets to raise their capital and for most capital markets, environmental reporting is a listing requirement. It is therefore argued that large organisations are more likely to compete for international resources than small organisations (Bowrin 2013:261). Burgwal and Vieira (2014:63) add that large organisations may report environmental information to protect or expand their reputation.

Moreover, the type of industry in which organisations is operating have been pointed out as a reason affecting environmental reporting exercise (see for example Branco *et al*. 2008). In earlier studies, organisations have been classified using different criteria, for instance –

- manufacturing and non-manufacturing organisations (Pahuja 2009:227);
- manufacturing sector and service sector (Ratanajongkol, Davey & Low 2006:70);
- environmentally sensitive industries and non-environmentally sensitive industries (Wiseman 1982:54; Yusoff & Lehman 2006:5); and
- public sector and private sector organisations (Pahuja 2009:230).

Likewise, organisations can be classified as high- or low-profile organisations (Hackston & Milne 1996:87). High-profile organisations are those organisations working in environmentally sensitive industries, and they are thus more exposed

to the political and social environment than low-profile organisations (Liu & Anbumozhi 2009:595).

A number of empirical studies have found a positive association between industry classification and environmental reporting (Boesso & Kumar 2007; Bowrin 2013; Burgwal & Vieira 2014; Clarkson, Li, Richardson & Vasvari 2008; Hackston & Milne 1996; Liu & Anbumozhi 2009; Lu & Abeysekera 2014; Suttipun & Stanton 2012a; Zeng, Xu, Yin & Tam 2012; Zhang 2013). It is true that organisations dealing in oil and petrochemicals, mining and minerals, steel and cement are regarded as companies with a high level of environmental impact, and they are normally expected to be exposed to strict regulations as they are expected to harm the environment. Therefore, they are expected to report more environmental information related to pollution prevention and control than non-polluting organisations.

For instance, in the study of the relationship between environmental disclosure and environmental performance, the findings showed that organisations from environmentally sensitive industries (mining, metal, oil and gas, chemicals and utilities, pulp and paper) disclosed more than other organisations (Sutantoputra *et al.* 2012:63). Likewise, the literature indicates that the manufacturing sector reports more environmental information than the service sector (bin Abd. Rahman *et al.* 2009:49).

In addition, Clarkson *et al.* (2008:3) studied US companies from sensitive industries (i.e. oil and gas, chemicals, pulp and paper, metal, mining and utilities) and argue that these companies are regarded as high polluting, and they have therefore been subjected to various environmental regulations for many years. The authors further argue that the major concern of investors and other environmental stakeholder groups may be to know not only the impact of their operation on the natural environment but also the amount spent to comply with environmental regulations.

The results obtained by Hackston and Milne (1996:97) indicate that the relationship between size and environmental reporting is stronger for the high-profile companies than for low-profile companies. They argue that size alone is not an adequate indicator to predict the level of reporting. This means stakeholders will be interested to understand more about companies with potentially risk actions than about companies with low impact.

On the other hand, studies on the relationship between financial performance and environmental reporting have produced mixed results. Some of the studies showed positive relationships (Al-Tuwaijri *et al.* 2004; Gozali, How & Verhoeven 2002; Iatridis 2013; Pahuja 2009; Stanwick & Stanwick 2000; Teoh, Pin, Joo & Ling 1998), while other showed negative relationships (Smith *et al.* 2007) and yet others showed no relationships (bin Abd. Rahman *et al.* 2009; Dragomir 2010; Yusoff, Yatim & Nasir 2002).

To summarize, organisations operating in Tanzania may also decide to provide voluntary environmental information for several reasons such as to:

- minimize cost of capital;
- improve the relationship between stakeholders and public;
- comply with existing laws and regulations;
- raise financial performance; and
- improve business operations

Large organisations and environmentally sensitive industries operating in the country are expected to provide more voluntary information due to existence of laws and regulations that they are required to comply. For instance, the cement and mining industry is more regulated by the government and more influenced by international standards than other sectors. However, the type and quality of information to be reported will depend on the choices of the managers. Therefore, in the absence of mandatory reporting, the decision whether to make general or specific voluntary disclosure lies in the hand of management, as they

will only report if the benefits of reporting exceed the cost of reporting (Meek *et al*. 1995:556).

The next section explains the evolution of integrated reporting. The section explains the drawback of traditional reporting and how sustainability reporting emerged. Further the section explains the drawback of the sustainability reporting that led to emergence of Integrated reporting. The benefit and the limitation of implementing integrated reporting is discussed. It is important to know the concept of integrated reporting because the reporting practice is changing from traditional reporting to integrated reporting. Various countries such as South Africa, the Netherlands, Brazil, the United Kingdom, Germany, Denmark and Finland are now preparing integrated reports. It is therefore thought that even for organisations operating in Tanzania should be aware of integrated reporting and be able to implement it when required to do so.

2.4 INTEGRATED REPORTING

Normally, organisations – both listed and unlisted – are mandated to prepare financial reports for the purpose of providing information on financial performance to shareholders and other stakeholders of the organisation. These reports are usually prepared based on a set of standards issued by IFRS. According to Eccles and Saltzman (2011:58), financial information reported have been criticised by various users, namely that information provided is complex, is not provided on time and is backward-looking. The authors further argue that it is not simple to establish the true and fair view of an organisation because the financial report does not include non-financial performance information, which is crucial for a long-term financial picture of the organisation. Boesso and Kumar (2007:269) point out that dissatisfaction with compulsory financial report has led investors and other stakeholders to require organisations to disclose information regarding their long-term strategy and performance.

Consequently, various organisations started reporting social and environmental issues in the form of disclosure in the annual report in an attempt to fill the

information that was missing in financial reports. Over the past two decades, organisations have started to prepare social and environmental reports (sometimes referred to as 'sustainability reports') separately as stand-alone reports, and even to a range of media like websites or newspapers (De Villiers, Rinaldi & Unerman 2014:1042), to ensure the needs of various users are met. Again, these stand-alone reports have been criticised for being complex and long as more issues are incorporated to meet the needs of various stakeholders (De Villiers *et al.* 2014:1043). There has been a move to put together social and environmental disclosure with financial disclosures in a single report to solve the problem of the length and complexity of the stand-alone report. Initially, the environmental and social disclosures in the annual report were not integrated with financial information. Therefore, this move aims to integrate social, environment, governance and financial information in a single document. This practice of putting together social, environmental, governance and financial information is known as integrated reporting (Eccles & Saltzman 2011:56).

The arguments for movement towards integrated reporting include:

- greater expectation for corporate transparency;
- resource scarcity;
- population growth;
- presence of excess of information on sustainability initiatives that continue to display key disclosure gaps;
- disconnection strands of information between governance, strategy, operations, financial and non-financial performance; and
- disparate reporting requirements among various jurisdictions, which are making reporting burdensome and costly for corporate reports (Desimone 2013:28).

Adams and Simnett (2011:293) point out that integrated reporting provides an opportunity to all types of organisations to improve their transparency, governance and decision-making. They further insist that integrated reporting is

expected to enhance the decision-making of long-term investors and funders. Owen (2013:341) points out that integrated reports can present more holistic, multi-dimensional and coherent representation of the business than the existing reporting model, which supply more detailed historical financial information. Several definitions of integrated reporting have been given from various sources, such as Eccles and Saltzman (2011:56) and EY (2014:1). However, the most common definition comes from the International Integrated Reporting Council [IIRC], (2013:33), which defines integrated reporting as:

> A process founded on integrated thinking that results in a periodic integrated report by an organisation about value creation over time and related communications regarding aspects of value creation […] An integrated report is a concise communication about how an organisation's strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term.

Generally, integrated reporting is expected to produce a report that will provide a brief, logical and objective picture of organisational performance. The integrated report, apart from merging non-financial and financial information in one document, intends to present clearly to users how organisations create and maintain value, taking into consideration the economic, social and environmental factors (IIRC 2013). Similarly, it has been pointed out that integrated reporting is not intended to be a compendium of every single piece of performance information, but rather a document that brings together in one place the material information on financial and non-financial information (Eccles & Saltzman 2011:59).

Even though integrated reporting is still in its infancy, several benefits have been given for adopting it. For instance, Eccles and Saltzman (2011:59) point out that integrated reporting will enable organisations to allocate internal resources better, to engage effectively with shareholders and other stakeholders, and also enable the organisation to lower its reputational risk. They further point out that

integrated reporting will enable organisations to meet the demands of investors who need environmental, social and governance information in their decision-making. Likewise, integrated reporting will provide an opportunity for organisations to get prepared to respond to any requirements from government, global regulations and requests from stock exchange markets and even participating in framework development and standard-setting processes (Eccles & Saltzman 2011:59).

Some challenges have been reported to be encountered by organisations interested in implementing integrated reporting (Eccles & Saltzman 2011:59). For instance, there is no globally accepted framework and standards, which specify what should be included in the report. This makes it difficult for users to compare the performance of different organisations who prepare their reports in an integrating format (Eccles & Saltzman 2011:59). Therefore, in order to overcome this problem, the IIRC was formed in August 2010, and its objectives were to make a worldwide agreed framework whereby information related to value creation can be communicated by organisations over time (Deloitte 2014b). The proposed international <IR> framework (see IIRC 2013) intended to reinforce the evolution of corporate reporting towards integrated financial and sustainability reporting, reflecting the developments in accounting, management commentary and to accelerate adoption of integrated reporting practices among corporations (Desimone 2013:28).

The international <IR> framework was issued by the IIRC in December 2013. The purpose of the framework is to provide guidance principles and content elements that oversee the overall content of the integrated report and to explain the basic concept that underpins them (IIRC 2013). The international <IR> framework does not intend to provide detail on how the individual items in the report should be treated; it rather provides the guiding principle that should be followed when preparing an integrated report (IIRC 2013). This provides room for each organisation to set out its own report keeping in mind that the report should show how the organisation has managed to create value over the short,

medium and long term. Further, the IIRC framework stipulates that the prime purpose of the integrated report is to clarify to the provider of financial capital how the organisations are creating value over time. However, other stakeholders interested to understand how organisations create value could use the information as well (IIRC 2013:4).

The organisations are requested to follow the principles of –

- connectivity of information;
- stakeholder relationship;
- reliability;
- materiality;
- strategic focus and future orientation; and
- conciseness, compliance, consistence and comparability when preparing their integrated reports.

In addition, the international <IR> framework requires organisations preparing integrated reports to ensure that the following content elements are included:

- governance;
- organisational overview and external environment;
- business model;
- risk and opportunities;
- performance;
- strategy and resource allocation; and
- outlook and basis of presentation (IIRC 2013:16,24).

In summary, integrated reporting is not intending to substitute another form of reporting; instead it wants to enable the preparers of the integrated report to use the information from various already available sources to explain the key drivers of their businesses value (ACCA 2015). Organisations that already prepare those reports will be in a better position to prepare integrated reports than those who do not. Organisations operating in Tanzania and which are focused on in this study will also be in a position to prepare integrated reports, as the developed

framework will assist them in preparing the environmental reports that will, later on, be used to prepare integrated reports.

The subsequent section discusses IAS/IFRS and environmental reporting. The aim of this section is to show how organisations operating in Tanzania can improve environmental reporting with the existing provision of the IAS/IFRS.

2.5 IAS/IFRS AND ENVIRONMENTAL REPORTING

Various researchers (see for example Barbu *et al.* 2014a; Firoz & Ansari 2010; Goyal 2013) attempt to tell how organisations can use IAS/IFRS to improve the environmental reporting process. Barbu, Dumontier, Feleaga and Feleaga (2014b:255) propose to the International Accounting Standard Board (IASB) to set a provision of minimum information disclosure related to environmental impact by organisations and this disclosure to be governed by a specialised standard. They further propose to different regulatory bodies and policymakers to bring together existing environmental regulations and environmental actions in their discussion relating to future environmental actions.

According to Barbu *et al.* (2014b:254), more than 120 countries (including Tanzania) use IAS and IFRS in reporting both non-financial and financial information in their annual report. The IAS and IFRS provide the guidance to organisations on issues regarding measurements, recognition and the presentation of various business transactions in annual reports. The reason of adopting IAS and IFRS is to aid the comparability of financial statements across the organisations. However, the differences in reporting still exist due to the flexibility of the standards, as well as the differences in legal, taxation and financing systems among countries (Barbu *et al.* 2014a:2).

There is no international standard that deals exclusively with environmental impact in annual reports. However, various standards provide such information directly or indirectly. The following is a discussion of various provisions in IAS and IFRS, which deal with environmental impact information directly or indirectly.

IAS 1 (IASB 2017) provides guidance on how the entity should prepare and present their financial statements. Generally, IAS 1 sets requirements such as the structure, minimum requirements of the content, and the distinction between current and noncurrent assets when preparing and presenting financial statements. The standard requires entities to disclose all financial risks. In this case, even environmental risks should be handled in the same way as all other costs, income, assets, and liabilities are handled. For instance, the financial statement can include information related to environmental liabilities or environmental expenses incurred by the entity to enable various stakeholders to understand the organisational environmental impact. The standard also encourages entities to provide both non-financial and financial information disclosure in addition to the financial statements. Therefore, this standard aims to ensure that the financial statements prepared can be compared both within and across entities.

IAS 8 (IASB 2017), provides a prescription for choosing and implementing accounting policies, changes in accounting estimates and errors when preparing financial statements. The standards require the entity to use IFRS applicable to a specific transaction and in a case where there is no IFRS related to such transaction, the management is left to use its judgment to develop and select the accounting policy that will provide information that is relevant and reliable. Regarding issues related to accounting estimates and errors, the standard allows the entity to change and use reasonable estimates, as well as material omissions or misstatements to be identified and corrected when preparing financial statements. According to Goyal (2013:53), business activities have inherent uncertainties that result in many items in the financial statements that cannot be estimated accurately. For instance, estimates related to environmental issues such as clean-up cost, noise pollution, air pollution, provision for acquisition of equipment for pollution control cannot easily be estimated. Therefore, standards provide room to correct these items when preparing financial statements as long as it does not undermine their reliability. In addition, changes in accounting

policies and the correction of errors are accounted for retrospectively, while accounting estimates are accounted for on a prospective basis.

IAS 10 (IASB 2017) deals with events after the reporting period. The standard provides guidance for when events occurring after the end of the reporting period, should be adjusted in the financial statements. According to this standard, the adjusted events after the reporting period are events that give proof that they existed at the end of reporting period. Non-adjusting events refer to events that have an indicative condition that they came up after the end of the reporting period. An entity may have an event with environmental impact, for instance, leakage of chemicals that was undetected (before the end of reporting period). Therefore, this event should be described together with its causes and adjusted to recognise the event. Although it will not be adjusted, material events after the reporting period will have to be disclosed-both the nature and estimate of the financial effect.

IAS 16 (IASB 2017) deals with environmental expenditure related to property, plant, and equipment. The standard requires the entity to capitalise the expenditure related to property, plant, and equipment only when there is a flow of economic activities in excess of the existing asset. However, the entity may capitalise the asset even when it was purchased for the purpose of meeting the provision of law for safety requirements or emission control, on the condition that, in the absence of this asset the entities will not be capable to continue with its operations. Furthermore, IAS 16 requires the future cost associated to dismantling and decommissioning to be taken into the cost of the asset at the beginning of the useful life of the asset.

IAS 20 (IASB 2017) provides assistance on how to account for government grants and government assistance. The standard provides two conditions to be met before accounting for government grants and/or assistance: (1) There is a guarantee that the entity will conform with the terms attached to them, and (2) There is assurance that the grant will be received. Basically, the accounting of

government grants depends on whether the grant is for compensation of expenses already incurred by the entity or as an asset for the entity. In case that it is for compensation of expenses, the grant is recognised in the statement of comprehensive income for the period it intends to compensate. In the case of the grant received as an asset it is recognised in the statement of financial position, either as deferred income or by subtracting it from the carrying amount. Therefore, entities who receive emission trading allowances from the government, treat it as a government grant and are required to account for the asset in their statement of financial position.

IAS 36 (IASB 2017) deals with impairment of the asset. The purpose of the standard is to ensure that no asset is recognised at more than its recoverable amount. This standard applies to an asset like land, buildings, machinery and equipment, investment property carried at cost, intangible assets such as goodwill, etc. The standard requires entities to perform an impairment test whenever there is indication or sign of impairment of an asset. The provision of this standard can also be applied to environmental asset. For instance, environmental assets can undergo impairment either because of contamination, depletion of mineral resources, or loss of contractual rights. In the case where the carrying amount of an asset is higher than its recoverable amount, the value of the asset is written down and an impairment loss is recognised in the profit and loss account.

IAS 37 (IASB 2017) provides a guideline on how to deal with the provisions, contingent liabilities, and contingent assets. The provision of this standard can also be applied to environmental contingent liabilities and assets. The standard requires three conditions to be met before provision is recognised:

- the entity should have a current obligation from past event(s);
- it is possible that the transfer of an economic benefit is required to settle the obligation; and
- a reliable estimation can be made of the amount of the obligation.

In order for the provision to be recognised, IAS 37 requires the entity to have a current obligation (legal and constructive). For entities operating in countries where there is no legal obligation, for instance to remove environmental contamination created, the provision can be made as there is a constructive obligation as long as the firm is acting in an environmentally responsible way. IAS 37 also requires the obligation to come from a past event. As a result, the only provision related to environmental loss that has already been incurred is made. Furthermore, IAS 37 states that in order for a provision related to environmental issues to be recognised in the accounts, it should be reliably estimated. The standard establishes that for environmental liabilities such as hazardous waste and pollutant releases that are difficult to estimate, not to be recognised in a financial statement, but a narrative disclosure will be required.

IAS 38 (IASB 2017) deals with intangible assets. This standard has some implications for environmental reporting. An environmental asset like an emission right purchased on the market or received as subsidy from the government is recognised and measured by this standard. IAS 38 requires the initial recognition to be recorded at cost, and a subsequent measurement at cost, or using a revaluation model. For instance, the carbon-emitting entities which purchase emission rights are required to record the purchased right at cost. In case this right was purchased at less than the fair value the standard requires the increase in fair value to be included in stockholders' equity and while decreases, at fair value, are recognised in the profit and loss account.

IAS 41 (IASB 2017) deals with agriculture. The standard offers guidance on how to account for activities related to agriculture. IAS 41 defines agriculture activities, as management of the transformation of biological assets into agricultural produce by entity. According to the standard, a biological asset is a living animal or plant. The standard requires the biological asset to be measured at fair value less the cost of sale. Generally, the standard does not mention environmental issues, but the targeted sector is highly environmentally sensitive.

IFRS 3 (IASB 2017) deals with issues related to a business combination. IFRS 3 provides the principles and requirements that should be followed when acquiring the business. Specifically, it gives guidance on how to recognise and measure the acquired asset, liabilities, and goodwill. It also guides the entity on what information should be reported to enable users to evaluate the nature of financial effects of the business combination. In this standard issue related to the environment, such as environmental liabilities that existed at the time of the business combination is also recognised. IFRS 3 recognises the acquired assets and liabilities at fair value.

IFRS 6 (IASB 2017) deals with environmentally sensitive industries, and it is linked to extractive activities. IFRS 6 provides guidance to entities on how to report expenditure incurred related to exploration and the evaluation of mineral resources. The standard allows the entities to develop and use their own accounting policies in measuring exploration and the evaluation of assets. However, it should be applied consistently from one time period to the next time period. IFRS 6 also requires the entities s to perform impairment tests to exploration and the evaluation of an asset when the situation suggest that the carrying amount of asset exceeds its recoverable amount. The impairment is recognised as per IAS 36.

IFRS 8 (IASB 2017) provides guidance to entities on how to report information about its operating segment in annual financial statements. Sometimes diversified entities own segments that directly link with environmental services and environmental protection, for instance green technology, clean energy, and recycling. Therefore, this IFRS permit such information to be incorporated in the financial statement of these large entities.

The review of IAS and IFRS shows that, despite the absence of an IAS and IFRS that deals extensively with environmental issues, the standards contain a series of elements related to environmental issues that can be identified, measured and even disclosed (i.e. assets, expenditures, and liabilities) using these standards.

Therefore, organisations intending to improve reporting related to environmental issues can use this information to improve their reporting.

The following section explains the initiatives that have been taken by various government around the world to promote environmental reporting. It is important to understand these initiatives as they will inform the author on the progress made from other countries to promote environmental reporting and compare with the initiative made in Tanzania.

2.6 INITIATIVES TAKEN TO PROMOTE ENVIRONMENTAL REPORTING

The increase in human activities that affect the environment in particular business activities has led to increasing awareness of environmental issues among people globally (Hackston & Milne 1996:77). As a result, most of governments around the world, especially from developed countries, decided to intervene to ensure that businesses are conducted in a sustainable way by introducing laws and regulations related to protection and conservation of the environment. Likewise, a variety of treaties have been introduced to ensure the environment is protected. Following are some of the environmental initiatives that have been taken by both developed and developing countries to ensure businesses are operating sustainably.

2.6.1 United Kingdom

In the United Kingdom, environmental reporting is guided by the Company Act of 2006, whereby both listed and large organisations are required to report on environmental and social issues relevant to stakeholders' understanding of activities (Henriques 2010; United Kingdom 2006:196). The Act requires directors of organisations to prepare a director's report each year, which provides a fair view of the business of the organisation, and to include environmental matters to the point that it will enable stakeholders to assess how directors perform their duties and understand the development and performance of the organisation. In 2008, the Climate Change Act was enacted. This Act sets a target for the year 2050 –

- for the reduction of targeted greenhouse gas emissions;
- to establish a committee on climate change;
- to suggest a system of carbon budgeting; and others (United Kingdom 2008).

In 2010, the United Kingdom introduced the Carbon Reduction Commitment (CRC), which aims to promote the organisations to set up better strategies for energy management (Initiatives for Responsible Investment 2015). Any organisation that exceeds 6,000 MWh usages per year is requested to assess and account for all their emissions associated with energy use to the Environmental Agency. All UK central government departments are required to take part in the CRC regardless of how much electricity they use (Environmental Agency 2014). Furthermore, it is mandatory for UK-listed companies to include in their reports carbon reporting (Deloitte 2014a). Therefore, the UK Department for Environment, Food and Rural Affairs (DEFRA) issued a guideline in June 2013 to assist organisations to comply with greenhouse gas (GHG) reporting. The guideline further requires all organisations doing voluntary GHG reporting and voluntary reporting on issues related to the environment to use key performance indicators (KPIs) (DEFRA 2013:1). In June 2014, the Financial Reporting Council (FRC) issued guidance on strategic reporting to enhance the new regulations introduced in 2013. The regulation requires certain organisations to prepare a strategic report as part of their annual report. According to the guidance, the strategic report should provide shareholders of the organisation with information to enable them to assess the performance of directors and promote the success of the organisation. The information should complement the financial statements (FRC 2014).

2.6.2 Australia

In 1998, the Australian Corporations Law was amended to include section (299(1)(f)) requiring environmental reporting in Australia by public organisations (Cowan & Gadenne 2005:166). The law required all public organisations to report

information related to the environment in annual reports and became effective on 1 July 1998 (Cowan & Gadenne 2005:168). In 2000 a framework for public environmental reporting was developed and the purpose of the framework is to provide easy and efficient guidance for environmental reporting at the national level in Australia. The framework also aims to promote voluntary public environmental reporting for organisations of any type and size from both the public and private spheres (Natural Heritage Trust 2000:2). In 2001, the Corporation Act 2001 was enacted, which required all organisations to provide the details of the environmental performance of organisations by considering the existing environmental regulations, and to report violations of environmental regulations, if any, in the director's report (Initiatives for Responsible Investment 2015; KPMG, GRI & UNEP 2010:24). In 2010, under the Financial Services Reform Act (FSRA), Australia introduced its new ethical disclosure requirements (Initiatives for Responsible Investment 2015). The Act requires the provider of a financial product to report the amount to which social, labour standards, environmental or ethical considerations are accounted for by the organisation when selecting or realising an investment (Initiatives for Responsible Investment 2015). Furthermore, in 2014, the Australian Securities Exchange (ASX) required listed organisations to disclose information related to social sustainability risks and material exposure to the environment together with their mitigation plans (Initiatives for Responsible Investment 2015).

2.6.3 United States

In the United States, various steps have been taken by government to address the requirements for environmental and social reporting. The reporting of Greenhouse Gas Rule (GHGR) often referred to as 40 CFR Part 9 was introduced in 2010 (Initiatives for Responsible Investment 2015). The GHGR requires the reporting of greenhouse gas emissions and other relevant information from certain sources categorised in the United States (Environmental Protection Agency [EPA], 2014). Similarly, in terms of the Sarbanes–Oxley Act of 2002, the chief executive officers (CEOs) of public organisations are required

to increase corporate transparency during reporting (KPMG *et al.* 2010:71). Organisations with more than 10 full-time employees are required by the Toxic Release Inventory (TRI) (see EPA 2017) to provide information on specified toxic chemical emissions to the Environmental Protection Agency (KPMG *et al.* 2010:72). Further, insurance organisations are required to provide to regulators financial risks they face from climate change together with the action taken to respond to those risks (Initiatives for Responsible Investment 2015; KPMG *et al.* 2010:74).

2.6.4 Canada

In Canada, among the government initiatives is the introduction of the Canadian Environmental Protection Act (the CEPA) in 1999 (KPMG *et al*. 2010:32). Organisations are required to report annually to the National Pollutant Release Inventory (NPRI) information related to pollutant emission, in case their emission exceeds the prescribed amount of listed pollutants (Initiatives for Responsible Investment 2015). In 2004, the CEPA expanded the requirement for large Canadian emitters to include GHG emission. Therefore in 2007 to 2008, the Canadian Standards Association (CSA) created GHG registries to assist organisations to control, estimate and report greenhouse gasses (Initiatives for Responsible Investment 2015). Moreover, public organisations are required by the Canadian securities commissions to report present and future environmental protection requirements regarding financial or operational effects in the annual information form (KPMG *et al*. 2010:31). Public issuers are encouraged by the commission to improve their reporting by increasing the preciseness of any environmental risks expected to affect the issuer (KPMG *et al.* 2010:32). Despite the mandatory reporting standards, the Canadian government promotes the existing voluntary reporting standards as issued by the CSA (KPMG *et al.* 2010:32).

2.6.5 China

In 2008, the Chinese Ministry of Commerce issued a draft of voluntary guidelines on CSR compliance by foreign investment enterprises (Initiatives for Responsible Investment 2015; KPMG *et al*. 2010). The guidelines intends to encourage foreign organisations when complying with corporate social responsibilities to consider their social, environmental and economic impact in terms of the Chinese people (Initiatives for Responsible Investment 2015). Further, in 2008 the "green securities" policy (see Wang & Bernell 2013) was launched which requires organisations listed on the stock exchange to provide information related to the environment (Initiatives for Responsible Investment 2015). In addition, state-owned enterprises are encouraged to follow the good practice of CSR and to report this to the public. However, the directive is not binding (Initiatives for Responsible Investment 2015). On the other hand, the Shanghai Stock Exchange (SSE) issued environmental disclosure guidelines that aim to assist listed companies in reinforcing their social responsibility issues. In case of organisations violating disclosure rules, the guideline gives the SSE the authority to punish those organisations (Initiatives for Responsible Investment 2015).

2.6.6 Europe

In **France**, among the initiatives of government was the enactment of a new economic regulation in 2002 (KPMG *et al*. 2010:44). This regulation requires all listed companies to report the information related to the environmental impact of their activities in their annual reports (KPMG *et al*. 2010:44). The second Grenelle Act of 2009 extended the requirement to organisations operating in the higher polluting sector and having more than 500 employees to report their greenhouse gas emissions and to update the information at least every five years (KPMG *et al*. 2010). In 2012, the Grenelle II Act was passed, and the requirement to report environmental, social and governance matters was further extended to all organisations operating in France. Large organisations were required to

comply by 2012 and small organisations by 2014 (Initiatives for Responsible Investment 2015).

In **the Netherlands**, the Environmental Protection Act of 1993 requires the largest polluters to furnish government with the necessary information on how they are complying with the international environmental standards (KPMG *et al*. 2010:57). In 1999, the government requested organisations operating in the Netherlands to publish an environmental report annually and to report therein information on environmental performance and environmental management systems (Initiative for Responsible Investment 2015). In 2010, the government further declared its intention to ensure that organisations have 100% sustainable procurement by considering environmental and social issues when awarding contracts. Therefore, organisations that bid for tenders are required to meet all the requirements of the government before being awarded the contract (Initiatives for Responsible Investment 2015).

2.6.7 Africa

Review of environmental reporting in Africa considered South Africa due to its effort on environmental protection. East African countries such as Kenya, Uganda and Rwanda were considered because of similarity in economic integration with Tanzania under the East African Confederation.

In Africa, **South Africa** is the only country that has considerable commitment to ensure the organisations in her jurisdiction are operating sustainably (GRI 2012). Both the South African (SA) government and the stock exchange market have made efforts to ensure that the goal of operating sustainably is met (KPMG *et al*. 2010). Among the government initiatives to ensure environmental reporting was the introduction of the King Report on Corporate Governance in 1994. Since 1994, the King Report on Corporate Governance has undergone several changes to incorporate the up-to-date needs. In particular, the King III code (see IoDSA 2009) requires annual reports to integrate both financial and non-financial issues and assurance of independent third parties (KPMG 2009). Similarly, the

code requires the annual report to be prepared every year, convey adequate and sustainability performance and focus on substance over form (KPMG 2009). The code applies to all South African organisations and is a listing requirement for the Johannesburg Stock Exchange (JSE). The King IV is the latest updated version released on 1 November 2016, which replaces the King III code. This code is more principle and outcome-based than rule-based (Deloitte 2017). Furthermore, the Minerals and Petroleum Resource Development Act No 28 of 2002 (see South Africa 2002) require mandatory disclosure of labour and social plans to government discussing the strategies to address the social effects of their operations (Initiatives for Responsible Investment 2015).

In **Kenya**, no initiative has been designed so far by government and the stock exchange to encourage organisations to report environmental and social information issues to the public (see Nairobi Stock Exchange [NSE] 2002). Despite the absence of environmental reporting requirements in Kenya, the issue of environmental management falls under the National Environment Management Authority (NEMA). NEMA was established under the Environmental Management and Co-Ordination Act (EMCA), No. 8 of 1999 (see Kenya 1999). The Act empowers the NEMA to exercise general supervision and coordination of all matters relating to the environment and to be the principal instrument of the government of Kenya in the implementation of all policies relating to the environment (Kenya 1999). NEMA have issued guidelines for environmental sustainability audit only to government ministries, departments and agencies whereby they are required to comply with the audit checklist required by the EMCA (NEMA No Year). NEMA provides a report on a country's state of the environment, which explains the environmental status and strategies set for the sustainable management of the environment (NEMA 2018). However, there is no framework to guide environmental reporting either as part of CSR or whatsoever has been instituted by NEMA. The NSE has indicated corporate governance as one of the listing requirements (NSE 2002). Still, no emphasis has been put on environmental reporting (NSE 2002).

In **Uganda**, environmental management issues fall under the National Environmental Management Authority, which is given authority by the National Environmental Act of Uganda (Uganda 1995). Like Kenya, both National Environmental Management Authority and the Uganda Stock Exchange (USE) put no emphasis on environmental reporting for the corporations (Uganda Stock Exchange [USE], 2003).

In **Rwanda**, environmental management falls under the Rwanda Environmental Management Authority (REMA). REMA has powers to request any organisation to submit the environmental status of purposes (REMA 2013). REMA specifies no requirements for companies to disclose their environmental activity as part of corporate governance (REMA 2013). The Capital Market Authority of Rwanda puts no emphasis on environmental reporting as part of the corporate governance by listed companies (RSE 2012) by the organisations operating in the country.

In summary, developed countries have taken remarkable initiatives to ensure the businesses operating in the country operate in a sustainable way. According to GRI (2012), the sustainability reporting statistics shows that in 2012, Europe (47%) was leading in preparing sustainability reports, followed by Asia (17%), Latin America and North America (both at 14%), Oceania (5%) and Africa (3%). However, the reports from Africa were all from South Africa (GRI 2012). Therefore, apart from South Africa, African countries still lag behind to implement initiatives that promote environmental reporting. East African countries including Tanzania, despite having specific legislation on environmental management, have no regulations that require organisations operating in their jurisdiction to report environmental information. Therefore, this research aims to promote environmental reporting in Tanzania by developing the framework that will guide the organisations operating in the country on what environmental information to report and how to report it.

Next section discusses three environmental reporting frameworks (i.e. global reporting initiatives, guidelines by DEFRA and a framework for public environmental reporting in Australia). The purpose of reviewing the frameworks was to establish the purpose, coverage and emphasis of each framework and if possible, to borrow some ideas that fit the framework developed for this study.

2.7 ENVIRONMENTAL REPORTING FRAMEWORKS

In order for environmental reporting to be complete and deliver the intended aims there must be a framework to guide the reporting process (Marc 2003). Various reporting frameworks exist to assist in environmental reporting. Despite having several reporting frameworks, this study intended to review the Global Reporting Initiatives guideline (see GRI 2013b), guidelines by the United Kingdom (UK) DEFRA (see DEFRA 2013) and a Framework for Public Environmental Reporting for Australia (see Natural Heritage Trust 2000). These frameworks were chosen as they provide the guide to organisations on which environmental information to be reported and how to report it. The frameworks are discussed below.

2.7.1 The Global Reporting Initiatives (GRI)

The GRI was established in 1997 by the Coalition for Environmentally Responsible Economies (CERES) and UNEP. The purpose was to design a common framework of globally applicable guidelines for preparing enterprise-level sustainability reports (Törnroos 2005). The first guideline was issued in 2000 and the second guideline, known as G2, was brought out at the World Summit on Sustainable Development in Johannesburg, South Africa in 2002. The third guideline (G3) was issued in 2006 and the fourth guideline G4 was issued in 2013. Apart of being more user-friendly than previous versions, the G4 guideline also emphasises the need for an organisation to focus its reporting on topics that are material to the key stakeholders and business of the organisation. Focusing on materiality will enable organisations to produce reports that are

more credible, relevant and user-friendly. Despite having several GRI versions, the present study reviewed the recent version of GRI guideline, the G4.

The G4 guideline intends to provide guidance to organisations to report their performance related to economic, social and environment (Global Reporting Initiatives [GRI] 2013b:5). The guideline is designed to be applied to all types of organisations of any size, sector or location. The guideline contains the content that has been approved by different stakeholders worldwide (civil society, business, financial markets, labour, auditors and other experts in the different fields) to be applied for reporting and measuring organisational sustainability performance. The guideline has been divided into two sections: the reporting principle and standard disclosures, and the implementation manual (GRI 2013b:7). The reporting principle and standard disclosure section includes the criteria and standard and reporting principles to be implemented by organisations when preparing their sustainability reports. On the other hand, the implementation manual provides detailed explanations on how to use the reporting principle, how to prepare information to be reported and how to interpret different concepts in the guideline (GRI 2013b:7).

Two options are offered by the guideline to an organisation when preparing its sustainability report: the core option and the comprehensive option (GRI 2013b:11). The core option requires reporting organisations to include only essential elements in their sustainability report (GRI 2013b:11). The organisation should communicate the key elements, such as the effects of its social, environmental and economic performance (GRI 2013b:11). The comprehensive option, apart from including essential elements, requires the additional standard disclosure of the governance, ethics, integrity, strategy and analysis of the organisation (GRI 2013b:11). Moreover, when an organisation communicates performance, it is required to communicate all indicators that have been identified as material (GRI 2013b:43). The option discussed can be used by all organisations despite their sector, size or location. Therefore, the guideline requires organisations to select the option that would meet the information needs

of their stakeholders. However, it should be noted that the choice of the option is not related to the performance or quality of the report of an organisation (GRI 2013b:11).

Section four of the G4 provides guidance on how to apply the reporting principle (GRI 2013b:16). G4 requires all organisations to apply the reporting principle when preparing sustainability reporting, as the principle are essential to achieve transparency in sustainability reporting (GRI 2013b:16). The guidelines divide the principles into two categories: principles for defining report content, and principles for defining report quality. The principles for defining the report content guide the organisation to decide which content should be covered in a report by looking at the activities of the organisation and their outcomes together with the interest and expectations of its stakeholders. These principles comprise stakeholders' inclusiveness, sustainability context, materiality and completeness (GRI 2013b:16-17).

The principal for defining report quality are designed to guide organisations to ensure that they produce sustainability reports that contain quality information and which are properly presented. The quality of information enables stakeholders to assess and evaluate the performance of organisations and to make sound decisions. G4 further points out that these principles are essential for attaining transparency. These principles are accuracy, balance, timeliness, comparability and clarity (GRI 2013b:17-18).

Section five of the G4 provides guidance on how to apply standard disclosures (GRI 2013b:20). Standard disclosure contains elements that should be incorporated in sustainability reports. According to the G4, two types of the standard disclosure are available: general disclosure and specific standard disclosure. General disclosures apply to every organisation preparing sustainability reports. However, the selection of the standard disclosure will depend on the choice of the 'in accordance' option of an organisation (GRI 2013b).

Specific standard disclosure is divided into two parts: disclosure on management approach (DMA), and indicators. DMA provides information on how organisations tackle certain issues to give an understanding of their performance in a specific area. According to the G4, DMA is intended to offer organisations the opportunity to explain how they manage effects related to the economy, environment and society (GRI 2013b:45). DMA provides information related to how an organisation identifies, analyses and responds to its actual and potential material economic, environmental and social outcomes. On the other hand, indicators provide information on the economic, environmental and social performance or outcomes of an organisation related to its material aspects (GRI 2013b:47).

Generally, the GRI guideline is used worldwide to report sustainability issues (Daizy & Das 2014:58). Apart from being used as a guideline for reporting sustainability issues, the GRI guideline is used by various researchers such as Arena and Azzone (2012) and Abeysekera (2013) as the basis for developing other frameworks. In the study to develop a process-based operational framework for sustainability reporting in small and medium-sized enterprises (SMEs), the GRI guideline was used as a starting point for selecting key sustainability indicators (KSIs) through a four-stage process (Arena & Azzone 2012:670). Furthermore, in a study to design a template for integrated reporting, the GRI guideline together with the UN Global Compact and The Economics of Ecosystems and Biodiversity (TEEB) was combined to design the template for integrated reporting (Abeysekera 2013). It was argued that although these frameworks make a great contribution to improving reporting information quality of organisational activities when used in isolation, they focus on one or two aspects of organisational reporting (Abeysekera 2013:232). The discussion above is summarised and presented in Figure 2.1.

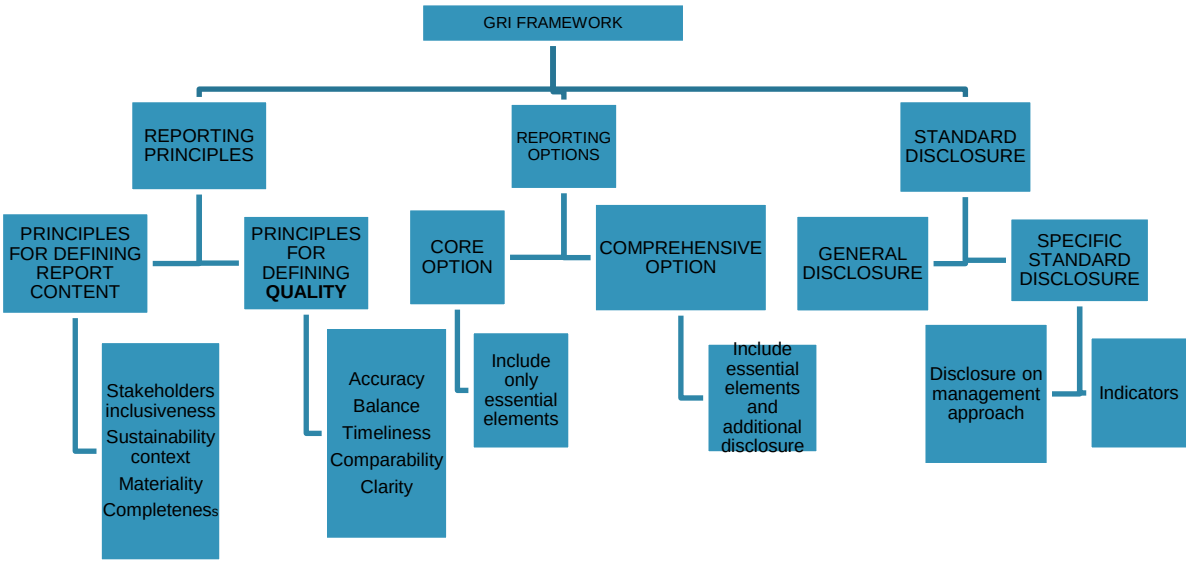


Figure 2.1: Summary of GRI framework

Source: Author's compilation

2.7.2 Guideline by UK Department for Environmental, Food and Rural Affairs (DEFRA)

The DEFRA environmental reporting guideline was prepared by the Department for Environment, Food and Rural Affairs (DEFRA), and was issued in June 2013. The guideline was prepared to help organisations comply with greenhouse gas (GHG) reporting. GHG reporting is a requirement from the UK Climate Change Act 2008 (DEFRA 2013:1). The guideline helps all organisations who voluntarily report environmental matters, including voluntary GHG reporting, using KPIs. According to the DEFRA guideline, the Company Act 2006 requires UK-listed organisations to report on GHG for which they are accountable in the Strategic Report and Director's Report. Furthermore, UK-listed organisations are required by the Company Act 2006 to report environmental information in their annual

reports to the level that will enable an understanding of the business of an organisation (DEFRA 2013:2).

The DEFRA guideline defines KPIs as a quantifiable measure that reflects the environmental performance of the organisation in a context of attaining its objectives and goals. KPIs help organisations to focus on key measures important for enhancing the understanding of organisations and to mitigate the problem of producing long reports (DEFRA 2012:9). According to the DEFRA guideline, KPIs can be divided into six categories: GHGs, waste, water, biodiversity or ecosystem services, materials and resource efficiency, and emission into the air, land, and water (DEFRA 2013:8).

Moreover, the DEFRA guideline points out the principles to be followed when accounting for and reporting environmental impacts. These principles want a disclosure report to be relevant, quantitative, accurate, complete, consistent, comparable and transparent (DEFRA 2013:3). The DEFRA guideline further provides guidance on the steps to be followed by organisations when reporting their environmental impact (DEFRA 2013:5). According to the DEFRA guideline, organisations are required to follow five steps in order to report key environmental impacts, namely:

- determine the boundaries of the organisations;
- determine the time for which data should be collected;
- determine the key impacts for the organisation;
- measure; and
- report. (DEFRA 2013:5)

These steps are all clearly explained in the guideline (DEFRA 2013).

The DEFRA guideline also emphasises that organisation should consider the issue of climate change in their business strategies and forward planning (DEFRA 2013:7). The DEFRA guideline stipulates that change in climate may lead to changes in temperature, rainfall patterns and sea levels (DEFRA 2012:12). These changes may affect organisations either positively or

negatively, and may cause a variety of risks, such as operational risk, risk related to revenue stream, and brand value patterns (DEFRA 2012:12). The DEFRA guideline points out that the risks related to climate change may –

- be disruptive to the supply chain and transport links;
- lead to lost productivity and damage to assets due to interruption to operations;
- be interruptive to the supply of essential services, such as water and energy;
- lead to workforce absenteeism; and
- be interruptive to information and communication technology.

According to the DEFRA guideline, the ability to get used to climate change varies across different industries and organisations (DEFRA 2012:12). According to the DEFRA guideline, a number of organisations have started to take into consideration the issue of climate change by developing a clear response to the challenge in their strategies and plans (DEFRA 2013).

2.7.3 A Framework for Public Environmental Reporting

A framework for public environmental reporting was developed after consulting various stakeholders, and the purpose of the framework is to provide easy and efficient guidance for environmental reporting at the national level in Australia. The framework also aims to promote voluntary public environmental reporting for organisations of any type and size from both the public and private spheres. The framework further intends to provide guidance on environmental reporting for organisations which have a mandatory reporting requirement (Natural Heritage Trust 2000:2).

In preparing the public environmental report (PER), the framework requires organisations first to **plan**, second to **measure** and third to **report and review**. In the planning stage, organisations are required to investigate the rationale for preparing the PER by identifying the potential benefits and drawbacks of preparing the PER, the coverage and scope of the PER and assessing the cost

and benefit of top-management commitment to preparing a PER. Also, in this phase, the organisations are required to identify key stakeholders and their needs when preparing a PER (Natural Heritage Trust 2000:8-13).

The second stage, i.e. the measurement, organisations are required to identify key environmental aspects and impacts for reporting purposes. After identifying key environmental aspects and impacts, organisations are required to identify and prioritise the relevant environmental performance indicators by setting appropriate objectives and targets including a timeline for meeting the commitment. This is followed by developing a means for measurement, including data collection, collation, and evaluation (Natural Heritage Trust 2000:14-21).

The third stage of a PER i.e. review and report, organisations are required to strengthen the effectiveness of communication by ensuring that the reports are prepared in accordance with the accounting principles. Moreover, the framework requires the organisation to publish by choosing the format that suits the requirements for the organisation and stakeholders, and to provide a feedback mechanism, as well as contact details for feedback, queries, and other information (Natural Heritage Trust 2000:22-25).

The framework also provides possible elements, which can be included by organisations in preparing a PER. According to the framework, there are ranges of examples of components/elements that can be included in a PER. A large number of possible indicators for each component are available which the organisations can report. However, it is not easy for organisations to report on all of them. The choice of which indicator to report to a large extent depends on the size and nature of the organisations and the interests of the key stakeholders. The guideline provides five major report components/elements, which are organisational context, management performance, environmental performance, policies and systems, stakeholder engagement, and product or service. These components are well explained in the guideline (Natural Heritage Trust 2000:26-37).

2.8 CHAPTER SUMMARY

The literature indicates that the early movement on environmental issues started between the 1960s and the 1970s. However, in 1972 the first conference related to the environment, i.e. Stockholm conference, was convened to discuss the human interaction with the environment. Various principles were set to guide the people of the world in the preservation and enhancement of the human environment. Likewise, a UN agency (i.e. UNEP) was established to coordinate environmental activities all over the world. Twenty years later, in 1992 the Earth Summit was held in Rio de Janeiro to lay a foundation for how the proposal of the Brundtland report could be achieved, and to agree on the main treaties on climate change, biodiversity and forest management.

Since then, there has been an increase in environmental reporting worldwide whereby Europe has been leading in reporting, followed by Asia, Latin America, North America, Oceania and Africa. However, the reporting from Africa comes from South Africa only. Several reasons have been given for the increase in reporting such as, an increase in laws and regulations related to environmental protection, an increase in media exposure toward limited natural resources, an increase in environmental disasters, the introduction of corporate governance, increases in awareness of the environment by various stakeholders, and a growing interest in ethical investments.

Moreover, literature indicates that, despite the increase in environmental reporting, the reporting is still done voluntarily. As a result, the type and quality of environmental information reported are still under debate. Specifically, the literature shows that the environmental information reported is incomplete and qualitative, and most organisations provide information, which is positive or neutral. When environmental reporting is voluntarily done, organisations have discretion in determining the breadth and depth of their reporting and in most cases, choose to disclose only favourable information.

Various benefits for social and environmental reporting have been given. Among the benefits that can be obtained by the organisation are: assessing preferred suppliers, an increase in the number of customers, gaining competitive advantages, and building and maintaining organisational reputations. Furthermore, environmental reporting improves the relationship with local communities, regulators and non-government institutions. In addition, environmental reporting increases the confidence of investors, insurers and financial institution, which could result in lowering the cost of capital and raising the value of stock.

Again, the literature indicates that various media (such as annual reports, websites, stand-alone reports and newsletters) are used to convey environmental information. Annual reports are the most well-known and commonly used media. However, the use of annual reports as sole reporting media has been challenged, as it provides incomplete insight regarding environmental disclosure of the organisation.

Once more, the literature indicates that there is a strong relationship between environmental reporting and the organisation-specific characteristics (i.e. size and industry type within which the organisation operates). Various studies show that the size of the organisation is positively related with the extent of environmental reporting. In addition, the studies show that environmental reporting for organisation operating in sensitive industry is larger than for organisation operating in non-sensitive industry. For instance, the organisations dealing in oil and petrochemicals, mining and minerals, steel and cement are regarded as companies with a high level of environmental impact, and they are normally expected to be exposed to strict regulations as they are expected to harm the environment. Therefore, they are expected to report more environmental information related to pollution prevention and control than non-polluting organisations.

The literature further shows that the dissatisfaction with compulsory financial reporting, which excludes non-financial information, cause investors and other stakeholders to start demanding organisations to disclose information that will enable them to evaluate the long-term strategy and performance of the organisation. To provide the information that was missing, organisations started to report social and environmental information in annual reports and stand-alone reports. However, the stand-alone report was regarded as being complex and long, as additional issues are incorporated in order to meet the need of various stakeholders. To avoid this problem of length and complexity it was proposed that financial and non-financial disclosure be integrated in the same document. This practice of putting together social, environmental, governance and financial information is referred to as integrated reporting. Integrated reporting does not intend to substitute another form of reporting; instead, it wants to enable preparers of integrated reports to use information from various already produced reports to explain the key drivers of their businesses' value. This implies that organisations that already prepare environmental reports and sustainability reports will be in a better position to prepare integrated reports than those who are not doing so.

Various initiatives have been taken so far by various countries to promote environmental reporting. Increases in human activities that affect the environment in particular business activities have led to increase in awareness of environmental issues among people globally. People now demand organisations to furnish environmental performance information to understand to what extent the organisation is committed to protect the environment within which it operates. As a result, the majority of governments around the world, especially from developed countries, came in to ensure that all businesses are conducted in a sustainable way by introducing laws and regulations related to environmental protection. Countries like the United Kingdom, France, Norway, Australia, the United States, Norway, South Africa – to mention a few – have introduced laws and regulations that require organisations that operate in their jurisdictions to

ensure they provide environmental performance-related information in their annual reports or separate reports.

Moreover, the reviewed frameworks showed that the information to be reported by organisations should have such quality that will enable the stakeholders to make sound and reasonable assessments of the performance of the organisation and take appropriate action. Frameworks therefore require the principles of balance, comparability, timeliness, accuracy, clarity and transparency to be followed when accounting for and reporting environmental impacts to ensure quality information is provided.

The literature further indicates that there is no IAS and IFRS, which deals exclusively with environmental impacts in annual reports. Regardless of the absence of IAS and IFRS, which deal extensively with environmental issues, the standards contain series of elements related to environmental issues that can be identified, measured and even disclosed (i.e. assets, expenditures and liabilities) using these standards. Thus, organisations intending to improve reporting related to environmental issues could use this information to improve their reporting.

Increase in awareness of environmental issues among people, increase in environmental reporting by various organisations globally, effort from IIRC to encourage organisations to integrate financial and non-financial information into a single report, the existence of various initiative from different governments to promote environmental reporting and the existence of various framework to guide environmental reporting in various countries has been a motivation for this research. This research therefore aims to promote environmental reporting for organisations operating in Tanzania by developing environmental reporting framework. The framework is expected to provide guidance to organisations operating in the country on what should be reported and how it should be reported.

The next chapter presents the overview of the industrial sector and environmental management in Tanzania. Specifically, the chapter will report on the development of the Tanzanian industrial sector, followed by a discussion of the legal and institutional framework for environmental management in Tanzania. Finally, the industrial processes for various industries will be described.

CHAPTER 3

OVERVIEW OF THE TANZANIAN INDUSTRIAL SECTOR AND ENVIRONMENTAL MANAGEMENT

3.1 INTRODUCTION

This chapter describes the industrial sector and environmental management in the Tanzanian context. The chapter provides the history of the Tanzanian industrial sector and the way the issues related to the environment are managed. In particular, the chapter explains various stages passed by the industrial sector, the problems encountered by the sector, and the way the Tanzanian government played its role in ensuring the industrial sector is moving forward.

The chapter further provides the policy and legal framework for environmental management in Tanzania. The National Environment Policy (NEP) of 1997 and the Environmental Management Act (EMA) No. 20 of 2004 are discussed. The NEP provides the framework for environmental planning and management in the country. EMA 2004, on the other hand, provides the legal and institutional framework for sustainable management (Pallangyo 2007:34). The legislation and compliance requirements for various industrial sectors are also presented.

Lastly, the chapter explains the production process from various industries operating in Tanzania. Each process together with its potential environmental impact is discussed. The aim is to point out the intensity of the environmental impact caused by each sector in the country.

3.2 TANZANIAN INDUSTRIAL SECTOR

The history of the Tanzanian industrial sector can be traced back to after independence. After Tanzania had gained its independence in the early 1960s, it had a low level of industrialisation and was the least industrialised among the three East African Common Market partners (Tanzania, Kenya and Uganda) (Skarstein & Wangwe 1986:2). At that point, there were 220 manufacturing enterprises each employing ten persons out of a population of nine million, and

contribution to the gross domestic product (GDP) from enterprises was about 4% (Skarstein & Wangwe 1986:2). According to Rweyemamu, 1973 as cited in Skarstein and Wangwe (1986:2), the low level of industrial development in Tanzania was caused by three factors. First, extra foreign investments were made in Kenya because Kenya had better infrastructure, which attracted more foreign investments than Tanzania. Second, the common external tariff policy in all East African countries gave more opportunities to Kenya, and resulted in the reinforcement of industrial concentration, as it was the most developed country. Third, Tanzania lacked an indigenous capitalist class, which could engage in industrial development. In order to overcome the challenges, the Tanzanian government decided to implement the three-year (1961–1964) and five-year development plans (1964–1969 and 1969–1974) (see Skarstein & Wangwe 1986:3-6).

Generally, during this period, the national economic agenda focused on growth with little attention to structural change or ownership (Wangwe, Mmari, Aikaeli, Rutatina & Mboghoina 2014:4). The three-year plan (1961–1964) was started, and the major emphasis was on growth (Skarstein & Wangwe 1986:3). The aim of the plan was to lay the foundations for a fast-growing economy (Skarstein & Wangwe 1986:3). In terms of industrial development, the national strategy was intended to establish industries that could process primary products for export and that could substitute importation (Wangwe *et al*. 2014:5). During this period, in order to attract foreign investment, the Tanzanian government offered tariff protection, guaranteed foreign investors against nationalisation, and designed a tax incentive structure (Rweyemamu 1973 as cited in Skarstein & Wangwe 1986:4).

In 1964, the five-year plan (1964–1969) was implemented (Skarstein & Wangwe 1986:4). The proposed plan was the continuation of the previous three-year plan, and aimed to improve the industrial development without changing the strategy inherited (Skarstein & Wangwe 1986:4). Skarstein and Wangwe (1986:4) identify the availability of capital and market size as the main constraints to industrial

development. To overcome a limited domestic market, the rules of the East African Common Market were changed (Skarstein & Wangwe 1986:4). First, a transfer tax system was introduced to provide protection to the industries operating in less developed countries. Second, an industrial licensing procedure was set up in order to reserve industries, which depended on the entire regional market (Skarstein & Wangwe 1986:4). Similarly, private investment (both local and foreign) was encouraged in order to tackle capital constraints (Skarstein & Wangwe 1986:4). As a result, more industries were established, and most were foreign-owned (Hazel 2013:188). As indicated by Rweyemamu as cited in Skarstein and Wangwe (1986:5), most of the establishments at the time were productive factories active in drinks, agro-processing and consumables. Large-scale organisations were set up to produce either for urban use or for export while small-scale organisations concentrated on the rural market (Wangwe *et al*. 2014:5). Consequently, during this period, industrial growth was impressive. This was largely contributed to a number of state subsidies and tariffs on manufactured imports that made local manufacturing profitable as part of a strategy to promote the growth of local industries (Hazel 2013:188).

In 1967, the Arusha Declaration was introduced under the socialism and self-reliance ideology (see Nyerere & President 1977). The main consequence of the Arusha Declaration was the change of ownership pattern whereby the major means of production were nationalised (Wangwe *et al*. 2014:5). However, due to a lack of indigenously owned industries, almost all the industrial firms that were nationalised were owned by Tanzanian Asians (Hazel 2013:188). For new parastatals, the investment was undertaken as a joint venture between the state and the private sector making it possible for the private sector to continue having an important ownership stake in nationalised companies (Silver 1984 as cited in Hazel 2013:188). Similarly, government increased control in the industrial sector by introducing an industrial licensing procedure (Wangwe *et al*. 2014:6). In order to monitor the flow of capital in and out of the country, strict regulations were established (Wangwe *et* al. 2014:6). Furthermore, government increased control

in setting, implementing and monitoring monetary and exchange rate policies. Generally, the industrial policy influenced by socialism resulted in an expansion of industrial parastatals, which in turn drove the growth of industrial output and diversification (Hazel 2013:188).

However, the performance of the industrial sector started dropping during the mid-1970s (Musa 2014:6). The major reasons for poor performance during this period were ascribed to a shortage of foreign currency following insufficient foreign earnings from trade in goods and services and the global oil crisis of 1973 (Musa 2014:6; Skarstein & Wangwe 1986:11). In order to import capital and intermediate goods, foreign exchange was needed. As a result, the country encountered a declining balance of payment, which negatively affected industrial production between 1973 and 1974 (Skarstein & Wangwe 1986:11). These shortcomings launched a discussion for a long-term (1975–1995) industrial strategy (Wangwe *et al*. 2014:6). In order to implement a long-term industrial strategy successfully, the following issues were taken into consideration, namely national goals to be achieved by the industrial sector were identified followed by allocation of resources and selection of priority industrial activities (Wangwe *et al.* 2014:6). The seven national goals identified were industrial growth, increased equality of income distribution, employment generation, worker participation in industry, structural changes, increased equality of regional development, and increased self-reliance (Skarstein & Wangwe 1986:7). Skarstein and Wangwe (1986:8) further postulate that at least five strategies were considered in the process of formulating the long-term industrial strategy, namely

- maximum growth strategy;
- East African strategy;
- small-scale rural strategy;
- basic industrial strategy; and
- a mixed strategy.

However, the basic industrial strategy (BIS) appeared to be a better strategy than the others, and it was suggested and adopted (Skarstein & Wangwe 1986:8).

The production of consumer goods, intermediate goods and capital goods was the main target under the BIS (Wangwe *et al.* 2014:6) . Industrial production was targeted to meet domestic market needs, and exports were to result as an extension of the domestic market (Skarstein & Wangwe 1986:8). In order to meet domestic needs, the BIS aimed to use domestic resources whereby most of the materials would be produced in the country (Skarstein & Wangwe 1986:8). Musa (2014:7) points out that the major goal of BIS was to improve sectoral linkages in order to attain a greater degree of economic self-sufficiency. He further points out that the BIS had two sets of industries:

- The first set of industries comprised industries that catered for the basic needs of the majority of Tanzanians, such as food processing, textiles, clothing, footwear and building materials.
- The second set of industries constituted the base of industrial production, which can use domestic resources to manufacture and supply intermediate and capital goods to industries of the first set, such as iron and steel, metalworking and engineering, and industrial chemicals.

Furthermore, Kim (1986:5) argues that the BIS aimed to attain the minimum economic scale of production, and industries were to be classified into national, district and village industries.

- **National** industries were expected to include large-scale activities catering for the national demand and, to some extent, for the export market.
- **District** industries would comprise mostly medium- and small-scale activities and were expected to cater for district demand.
- **Village** industries were expected to make simple basic goods for village use.

However, despite the emphasis of the Tanzanian programme on village-level development, priority has been given to the development of manufacturing projects of fairly large industries (Kim 1986:6).

Unfortunately, despite these impressive initiatives, the performance of the industrial sector continued to decline. In the late 1970s, Tanzania faced a war with Uganda leading the Tanzanian government to exhaust its reserve by $600 million, followed by the second global oil crisis (Kim 1986:4). The second oil crisis raised the price of oil by 25–30% which resulted in the decline in export of Tanzanian products (Kim 1986:4). In the early 1980s, as a strategy to increase export, the Tanzanian government introduced an export rebate system (ERS) to serve as subsidy for producers of horticulture goods, alongside a general retention scheme (GRS) for exporters to deposit part of their foreign exchange earnings for the purpose of importing inputs (Wangwe *et al*. 2014:6). Moreover, government introduced a home-grown adjustment programme to deal with the crisis, yet it did not achieve its goal as chronic malaise continued to persist (Wangwe *et al.* 2014:6).

During the mid-1980s, the structural adjustment programme was introduced with the aim to revamp the dwindling industrial sector (Musa 2014:8). Thus, trade liberalisation was introduced and considered a key ingredient of the structural adjustment programme. However, trade liberalisation had some weaknesses, for instance during the move from a state-owned economy to privatisation, government assumed the role of regulator of the economic sector (Wangwe *et al.* 2014:12). However, there were no proper regulatory authorities for the implementation of the role assumed. Thus, during this period, infant industries found it hard to survive due to the sudden removal of protective trade measures and later on, a massive flow of imports (Hazel 2013:191; Musa 2014:8). Furthermore, a decline in agriculture yield and production of poor-quality products was also pointed out by URT and UNIDO (2012:17) as a reason for stagnation of the industrial sector. As a result, to overcome the disaster, government agreed to take restrictive measures after the move from a state-

owned to a market-driven economy and the country returned to the path of recovery (United Republic of Tanzania [URT] 2011a:11). Despite the positive signs of revival showed by the industrial sector, the sector encountered international competition which caused several industries to close down (URT & UNIDO 2012:17).

During the mid-1990s, the Sustainable Industrial Development Policy (SIDP) 1996–2020 (URT 1996) was developed with the purpose of government phasing out investing directly in productive activities and letting the private sector be the principal for that role. The policy intended to enhance the growth of the industrial sector by ensuring that employment is created, the economy is transformed, equitable development is attained, and that there is an appropriate balance between import substitution and export orientation and environmental sustainability (URT 1996:3). Government provided an enabling environment by setting the policy, rules and regulations that would ensure a supportive environment for the sustainable growth of the industrial sector. Under this arrangement, government was responsible for investing directly in industries that are unprofitable for the private sector, but where activities are important to the overall development goals (URT 1996:13). Moreover, government focused on the rehabilitation of the available industrial capability through management, capital and financial restructuring (Musa 2014:9). The designed strategy incorporated promotion of SMEs, privatisation of existing industries, attracting foreign direct investment (FDI), and promotion of the private sector as a key player. The strategy was to be implemented in three phases:

- **Phase I** (1996–2000) was a short-term programme to rehabilitate and consolidate existing industrial capacities.
- **Phase II** (2000–2010) was a medium-term programme to generate new capacities in areas with potential for creating a competitive advantage by using efficient technology and through the process of learning. In this phase, emphasis was put on promoting the production of intermediate goods, light capital goods, and machine making.

- **Phase III (2010-2020)** covered a long-term programme, which aimed to attain major investment as planned in phases I and II (URT 1996:7-11).

However, there was no apparent strategy regarding the environmental aspects of the expansion of the industrial sector. Generally, during this time, government improved the enabling environment by ensuring that it provides stable and simple regulations, transparency, physical incentives and macroeconomic stability (URT & UNIDO 2012:18).

Furthermore, the national vision, the Tanzania Development Vision 2025, was launched in 1999 (Wangwe *et al*. 2014:8). The purpose of Tanzania Development Vision 2025 was to convert the country from low to middle economy by the year 2025 (URT 2011a:1). In particular, Tanzania Development Vision 2025 intended to convert the country from a market- and weather-dependent economy to a self-sustaining semi-industrialised economy. Tanzania Development Vision 2025 was planned to be implemented through five-year development plans (URT & UNIDO 2012:18).

Since 2000, economic reforms have transformed the industrial sector whereby both inflow of FDI and the acquirement of productive facilities by the private sector have increased (URT & UNIDO 2012:18). Although the country's citizen economic activities depend on small-scale agriculture, a number of manufacturing firms have been established in Tanzania, which comprise industries such as cement mills, pulp and paper industries, breweries, steel mills, agrochemicals and mining. Tanzania still acknowledges the importance of the industrial sector in economic development. A number of policies have been put in place to ensure the goals of Tanzania Development Vision 2025 and the SIDP are achieved successfully. Some of the policies are the National Trade Policy 2003 (URT 2003b) and the Small and Medium Enterprise Development Policy 2002 (URT 2002).

Moreover, to augment the effort to attain Tanzania Development Vision 2025 goals, the Tanzania Mini-Tiger Plan (TMTP) 2020 was introduced in 2005 by

imitating the Asian Tigers model in Tanzania. The programme aimed to promote special economic zones (SEZs) in order to attract investment and increase employment opportunities (URT & UNIDO 2012:18). The idea of the programme is that Tanzania cannot acquire the requisite infrastructure throughout the country in a short period of time as a result of budget constraints, competing demands, and difficulties of geography facing the country (URT & UNIDO 2012:18). According to Babile (2009), the TMTP 2020 was to achieve the following targets:

- to attain an 8 to 10% GDP growth rate;
- to raise GDP to USD 40 billion;
- to raise export from about USD 1.1 billion to USD 20 billion;
- to build up 25 to 30 SEZs in Tanzania; and
- to attain an aggressive promotion of FDI and domestic investment and to generate two to three million new jobs by the year 2020.

However, the TMTP 2020 failed to attain its objectives because the focus of donors was shifted towards the implementation of the National Strategy for Growth and Poverty Reduction (NSGRP) (URT & UNIDO 2012:18).

In 2010, the Tanzanian government reviewed its 10 years of Tanzania Development Vision 2025 and realised that in order to achieve the goals and objectives set by Tanzania Development Vision 2025, both medium- and long-term strategies were necessary. The medium strategic plans were to be implemented in five years' time for the remaining fifteen years. Therefore, the first five-year development plan (FYDP I) was implemented from 2011/12 – 2015/16. The overall goal of FYDP I was to embark on poverty reduction by using natural resources (URT 2011b:42). Specifically, the plan aimed to improve the human capital and physical infrastructural networks in order to foster Tanzanian competitiveness by accelerating investment (URT 2011b:42). Similarly, the Long-Term Perspective Plan (LTPP) (2011/12 – 2025/26) acts as a roadmap and plays an important role in both development and in the realisation of the Tanzania

Development Vision 2025 (URT & UNIDO 2012:19). In general, the FYDP I focuses on removal of binding constraints to growth that will enable the growth of industrial sectors (particularly for agro-processing, natural gas-based and medium technology industries) in FYDP II (2015/16–2020/21), while the focus of FYDP III (2020/21–2025/26) is to promote the competitiveness of the manufacturing sector and improve Tanzania's share in regional and global trade (URT & UNIDO 2012:80). By doing so, industrialisation will be the central point for Tanzania's future growth agenda (Musa 2014:10).

Besides the LTPP, in 2011, the Tanzanian government implemented an Integrated Industrial Development Strategy (IIDS) 2011–2025 to intensify the implementation of the SIDP and to facilitate the realisation of the objectives and targets stipulated in Tanzania Development Vision 2025. According to Wangwe *et al.* (2014:8), the strategy was formulated to build a competitive industrial sector by putting in place a competitive business environment and improving an existing development corridor, concentrated infrastructure and development and promoting agriculture-led industrialisation. Specifically, the objectives of the IIDS 2025 are to:

- build an internationally competitive business environment by –
    - developing industrial cluster formation;
    - bringing about concentrated infrastructure development;
    - promoting internationally competitive industries and enterprises; and
    - strengthening the backup institutional framework, all of which will make the industrial sector the real engine of economic growth;
- make Tanzania the industrial and logistic hub of the Eastern and Central African region, though the extension and improvement of the existing development corridor and the establishment of an export and import platform at the waterfront located at Dar es Salaam, Mtwara and Tanga;

- promote rural industrialisation through an Agricultural Development-led Industrialisation strategy, to support the successful implementation of *kilimo kwanza* (meaning government gives first priority to agriculture) and enhance equitable regional growth; and
- provide growth opportunities to all growth-oriented micro, small and medium-sized enterprises and entrepreneurs through the provision of attentive supporting measures appropriate to each of the specific developmental stages through which local enterprises and industry pass as they upgrade and graduate from the bottom upwards (URT 2011a:15).

Generally, these policies and strategies bring fruitful results, which are realised by the ongoing mega constructions of the gas production plant in Mtwara, iron ore and coal production in Liganga and Mchuchuma respectively, and the uranium plant in Namtumbo to mention a few. In October 2015, Tanzanian president Jakaya Kikwete inaugurated the operation of the cement industry in Mtwara, which is an indicator of industrial growth in the country. Therefore, it is expected that the presence of these industries will promote the growth of other industries. For instance, the introduction of the Liganga iron ore project will accelerate the growth of steel and ferrous-based manufacturing industries in the country. Furthermore, the presence of oil refining (i.e. oil and gas) will increase the likelihood of the availability of stable energy sources that will attract more establishments of manufacturing industries in the country. Similarly, the production of agrochemical and other chemical output from the oil refining and gas industries will result in the establishment of other chemical industries in the country. Moreover, initiatives of the Tanzanian government, which are evidence for government promoting investment and industry growth in Tanzania are:

- the Tanzania Investment Centre (TIC) (URT 2018b), which promotes and facilitates investment in the country;
- the Tanzania Investment Bank (TIB) (TIB 2018), which provides capital to local investors; and

- special export zones, which promote exports by local manufacturers.

Despite the initiatives taken by government to promote the industrial sector, little has been done so far to protect the environment within which these industries operate (URT 2004). These emerging industries are all environmentally sensitive because they consume natural resources from the environment as raw material for their operations. It is thought that more efforts should address environmental aspects by ensuring that these growing emerging organisations operating in Tanzania commit to environmental protection and sustainable development in their business strategies. Furthermore, organisations are expected to release their environmental information, such as the environmental impact arising from business operational activities, information related to pollution compensation, the environmental policies and environmental lawsuits to the public and potential investor (Zhongfu *et al.* 2011:1219).

3.3 LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT IN TANZANIA

The policy that governs environment-related issues in Tanzania is the National Environment Policy (NEP) of 1997 (URT 1997). The NEP recognises that all Tanzanians are intimately connected to the environment, and it is a necessity to maintain future good relationships between the natural environment and humans (URT 1997:1). Likewise, the NEP stipulates that Tanzania should make an effort to manage its natural environment when promoting growth and opportunity for sustainable development of present and future generations (URT 1997:1). Therefore, the objectives of the NEP are:

- ensuring sustainability;
- conservation of natural resources;
- improving the conditions and productivity of degraded areas; and
- raising public awareness on environmental conservation and the proportion of international corporation on the environmental agenda (URT 1997:9).

The organ which is responsible for environmental management issues in Tanzania is the National Environment Management Council (NEMC) (URT 2015a) and operates under the Environment Management Act (EMA) No. 20 of 2004 (URT 2004). The NEMC reports to the office of the Vice-President and is responsible to the minister of environment. The EMA gives a mandate to the NEMC for the administration of environmental regulations in Tanzania (URT 2004:28). The NEMC has also been given powers by the EMA as the main government advisor on all issues related to the environment (URT 2004:27). Some of the regulations, which ensure implementation of the EMA, are:

- the Environmental Impact Assessment and Audit Regulations, 2005 (URT 2005);
- the Environmental Management (Air Quality Standards) Regulations, 2007 (URT 2007a);
- the Environmental Management (Water Quality Standards) Regulations, 2007 (URT 2007b).

Section 30 of the EMA of 2004 requires every government ministry to establish an environment unit (URT 2004:33). This unit is responsible to ensure that all environmental issues within the sector activities are well managed as per the environmental regulations set by the NEMC. Further, the unit is required to organise activities connected to the environment within the ministry. Ministries have been given a mandate by the EMA 2004 to ensure that issues related to the environment are integrated into the ministry and projects are implemented in a way that protects the environment. Likewise, the EMA 2004 requires any project, which is expected to have significant environmental impact before its development to undertake an environmental impact assessment (EIA). However, projects that existed before the issuance of this Act were required to perform an initial environmental audit to evaluate the level of environmental impact and to take corrective actions (URT 2004:64).

The Tanzanian industrial sector covers a range of industries, such as mining, textiles, oil and gas, energy, food, beverages, fertilisers, cement, chemicals,

plastic and rubber with different levels of environmental impact (CTI 2016). These industries are monitored by different ministries and agencies to ensure compliance with existing legislations. Some of the legislation are specific for a sector while others are cross-sector, meaning that they are required to be complied with by different industries. The next paragraphs present a discussion of cross and specific sector legislation.

All industries in Tanzania are required to comply with the Occupational Health and Safety Act, No. 5 of 2003 (URT 2003c). The Act deals with protection of human health and occupational hazards in the work place. Employers are required to ensure that health and safety in the workplace are maintained by providing a favourable working environment, safety gear and compliance to control of various forms of pollution such as air, noise and water. The owner or occupier of a factory is further required to register the factory or a workplace before starting operations. Likewise, the Act requires medical examinations for fitness during employment and for existing employees to be carried out regularly by qualified occupational health physicians. The Act further requires such medical examinations to be carried out on employees leaving the factory. Health and safety provisions while attending machinery and other work are also provided. The Occupational Safety and Health Authority (OSHA) (URT 2018a) is a legal authority for the administration of the Occupational Safety and Health Act, No 5 of 2003 in the country.

Moreover, industries, which require the use of chemicals in their processes are required to comply with the Industrial and Consumer Chemicals (Management and Control) Act, No. 3 of 2003 (URT 2003a). The Act requires any person dealing with industrial chemicals to register with the Industrial and Consumer Chemicals Management Board. The Act requires any applicants who register for chemicals production, warehousing, exporting, importing or dealing in chemicals, among others, to provide details on the chemicals and their possible dangers to human and the environment, arrangements made or to be made to ensure the health and safety of living beings and the environment, and the proper disposal

or treatment of the chemicals (URT 2003a:15). Specifically, if the application for registration is for the production of chemicals, the Consumer Chemicals (Management and Control) Act, No. 3 of 2003 requires the company before issuance of a certificate to consider among other things whether

- an EIA has been carried out;
- an environmental management plan certified by the NEMC has been submitted; and
- adequate measures had been taken to minimise or prevent damage to humans and the environment (URT 2003:19-20).

Industries, such as mining, textile, pulp and paper, plastics and rubber, fertilisers, tanning and leather are required to comply with the provisions of this Act. The third schedule of the Act provides a list of chemicals that need to be registered. The Government Chemist Laboratory Agency (GCLA) (GCLA 2018) is responsible to ensure compliance with the provisions in the Act.

The **mining industry** in Tanzania is monitored by the Ministry of Energy and Minerals and is regulated by the Mining Act No. 14 of 2010. The Mining Act No. 14 of 2010 provides requirements for environmental compliance to all mining companies when applying for licences as well as during the entire life circle of the mining activities. Specifically, the Mining Act No. 14 of 2010 requires applicants for mining licences and special mining licences to include EIA certificates with their application. All mining licenses require licensees to comply strictly with regulations related to safety and environmental management during the implementation of mining projects regardless of the scale of such mining activities (URT 2010:50). Further, the Mining Act No. 14 of 2010 requires large-scale mining organisations to post rehabilitation bonds to government to finance the cost of rehabilitation in case they fail to meet their commitments (URT 2010:44). In addition, all mining organisations whose activities involve the use of explosives must comply with the provisions of the Explosives Act, No. 56 of 1963.

The Tanzania Mineral Audit Agency (TMAA) is responsible for auditing the mining industry to ensure that among others there is proper environmental management in the mining areas. Specifically, the annual audit is conducted to existing mines to check for compliance with legal requirements on environmental management, to assess the implementation of the commitment made in the environmental management plans, and to check whether the environmental budget is adequate to cover progressive rehabilitation (URT 2015b).

The **sugar industry** falls under the Ministry of Agriculture, Livestock and Fisheries. The Sugar Board of Tanzania (SBT) has a legal mandate for the regulation of the sugar industry as per the Sugar Industry Act, No. 26 of 2001. The SBT is responsible for ensuring that there is adequate and sustainable sugar production. However, the Act does not make any provision related to environmental protection and management to be complied with by the sugar industry. Hence, environmental issues are directly managed by the NEMC (Sugar Board of Tanzania [SBT], 2014).

The **petroleum and gas industry** fall under the Ministry of Energy and Minerals. The industry is regulated by the Energy and Water Utility Regulatory Authority (EWURA). In the case of petroleum products, EWURA is required to regulate the importations, unloading, transporting, storage, transforming and selling of the product in the country. The services regulated are oil marketing organisations, lubricants and liquefied petroleum gas wholesalers and retailers. In the absence of the NEMC regulations, the environmental safeguards defined under the EWURA Act of 2001 and the Ministry of Energy and Minerals shall apply (EWURA 2016).

The **textile industry** falls under the Ministry of Industry and Trade. The ministry has a section called the 'Textile Development Unit' (see URT 2016b). The unit is responsible for helping new investors in the industry to invest in Tanzania (URT 2016b). The unit is also responsible for assisting existing investors to expand

production volume and secure new markets. In addition, the unit provides a link for potential and existing textile investors to various agencies such as

- the Tanzania Investment Centre (TIC);
- the Tanzania Export Processing Zone Authority;
- the Vocational Education and Training Authority (VETA);
- Small Industries Development Organisations (SIDO);
- the Tanzania Cotton Board (TCB);
- the Tanzania Bureau of Standards (TBS); and
- the Tanzania Revenue Authority (TRA).

Most importantly, the unit is responsible for guiding the policymaking process and its implementation to ensure the investing climate for textile garments and apparel production in the country is good (URT 2016b). The industry is required to adhere to the water and air quality regulations issued by NEMC (see URT 2007b)) since their processes involve production of waste water and air emission (Meenaxi & Sudha 2013:1). In the same way, textile industries are required to comply with the Industrial and Consumer Chemical (management and control) Act, No. 3 of 2003, because their processes involve use of hazardous chemicals such as strong alkaline and acid solutions.

Other industries such as beverages (this includes both beer and soft drinks), food and water, steel mills, pulp and paper mills, glass, printing, electronics, tanning and leather, pharmaceuticals, chemicals, metal, plastic and rubber, are all monitored by the Ministry of Industry and Trade under the Department of Industry. This department is responsible for ensuring the growth and development of the industrial sector in the country. In particular, the department is required to develop, monitor and review implementation of policies, strategies, guidelines and legislation for industrial development (URT 2016b). In addition, it is responsible for facilitating manufacturers associations, monitoring performance and implementation of industrial development projects, and evaluating industrial performance in terms of outputs, competitiveness and development (URT 2016b). Thus, these industries are required to adhere to

regulations provided by the NEMC and other legislations from other sectors related to their activities.

There are various sectoral policies, Acts and regulations, which provide environmental safeguards in line with the NEP 1997 and EMA 2004. It is the responsibility of every organisation to comply with the environmental safeguards relating to the environmental aspects of the organisations. Table 3.1 provides a list of sectoral policies and sectoral Acts that contain environmental safeguards in Tanzania.

Table 3.1: Sectoral policies and Acts containing environmental safeguards in Tanzania

S/N	Policy	Acts
1	National Land Policy (1995)	Land Act No 4 of 1999 Village Land Act No 5 of 1999 Land Use Planning Act No 6 of 2007
2	National Forestry Policy (1998)	The Forest Act No. 14 of 2002
3	Health Policy (1998)	The Occupational Health and Safety Act No 5 of 2003 The Industrial and Chemical Management Act No. 3 of 2003
4	National Tourism Policy (1999)	The Tourism Act No 28 of 2008 The National Parks Ordinance, No 12 of 1959
5	National Water Policy (2002)	Water Resources Management Act, No 11 of 2009 Water Supply and Sanitation Act No 12 of 2009
6	National Energy Policy (2003)	EWURA Act 2001 Rural Energy Act No 8 of 2005 Petroleum (Exploration and Production) Act, No 27 of 1980 Petroleum Act No 4 of 2008 Electricity Act No 10 of 2008
7	Wildlife Policy of Tanzania (2007)	The Wildlife Conservation Act No 5 of 2009
8	Mineral Policy of Tanzania (2009)	Mining Act No 14 of 2010

Note: S/N = serial number

To summarise, despite stipulating a variety of requirements and compliance on a range of issues, the NEP as well as the EMA and its regulations, remain silent on issues related to environmental reporting for industries operating in Tanzania. The law and regulations do not provide any legal requirements for environmental reporting for organisations operating in Tanzania. The EMA 2004 and its regulations are silent about whether existing and emerging industries are expected to show their commitment to the environment and community protection in order to ensure sustainability of these industries. There are lots of emerging industries in Tanzania whose existence, if not properly managed, would lead to environmental degradation. The organisations operating in Tanzania (e.g. cement and mining) have been left to decide on their own whether to report or not to report environmental information. It is thought that these requirements and compliance could work effectively for the Tanzanian industrial sector if there could be a requirement for reporting and a guideline or guidelines to assist them to prepare and report issues related to the environment. Therefore, the present study aimed to fulfil this purpose of ensuring that organisations operate in a sustainable manner.

3.4 DESCRIPTION OF INDUSTRIAL PROCESSES AND POTENTIAL ENVIRONMENTAL ISSUES

This section provides a description of the various processes from highly polluting industries and their potential environmental issues in Tanzania. In particular, the processes from leather, mining, textile, cement, sugar, steel, breweries and the pulp and paper industries, together with their environmental issues during the operation phase are discussed. The aim of this discussion is to know the intensity of the environmental impact caused by different industries operating in the country These industries have been selected because their processes and impact on environment differ from each other. Material input required and the emissions generated from each process is different and pose diverse impact to the environment.

3.4.1 Leather industry

The leather industry is divided into two sub-sectors: leather processing and leather products. Leather processing involves all operations, such as pre-treatment of the hide or skin, tanning and finishing. These operations involve high consumption of water and the use of chemicals, which in turn release high volumes of hazardous effluent to the environment (International Finance Corporation [IFC] 2007h:2). As indicated in Table 3.2. the first step in leather processing involve soaking the hides and skins in water in order to remove salts, insecticides and other bound material. There after the hairs from skins and hides are removed using water, alkaline lime and sodium sulphide. The process of removing hairs from skins and hides is referred to as liming. After liming the Deliming, bating and pickling processes follows which remove lime and non-structural proteins from hides and skins using acid, water and enzymes. The tanning process then is done to give toughness, pliability, and breathability to the leather. The materials used in tanning process are water, chromium salt acids and alkali. The process is finished by adding various chemicals such as polyurethanes, acrylic-based chemicals silicon, oily and waxy compound which enhances the aesthetic and performance characteristics of the leather. Detailed leather processing and its environmental impact are discussed in the literature and are summarised in Table 3.2.

Table 3.2: Leather processing and sources of pollutants

Stage	Purpose	Material used	Type of pollutants
Soaking of hides and skins	removal of salts, which were used for curing of the skins and hide, insecticides and other bound material	water	effluents rich in salts, nitrogen and dissolved solids
Liming	removal of hairs from the skins or hides and conditioning of the skins and hides	water and alkaline lime and sodium sulphide	effluent rich in hairs and lime

Stage	Purpose	Material used	Type of pollutants
Deliming, bating and pickling	removal of lime and non-structural proteins	acids, water and enzymes	acidic effluents and ammonia
Tanning	gives toughness, pliability, waterproofing and breathability to the leather	water, chromium salts, acids and alkali	effluent rich in chromium and salinity, which may also be acidic unpleasant smell of hydrogen sulphide gas; presence of organic matter, which consumes oxygen required by aquatic microorganisms the hydrogen sulphide gas has serious health effects for humans if the exposure concentrations are not controlled
Finishing	enhances the aesthetic and performance characteristics of the leather with respect to particular end applications	various chemicals, such as polyurethanes, acrylic-based chemicals, silicon, oily and waxy compounds	effluents rich in polyurethanes, acrylic-based chemicals, silicon, oily and waxy compounds

Source: (IFC 2007h)

The Tanzanian Leather Sector Development Strategy 2016–2020 (URT 2016a:41) indicates that up to 150 litres of water are required in order to process 1 kg of leather. Furthermore, the voluminous effluents from the tanneries are discharged into water bodies untreated, posing significant environmental effects (URT 2016a:41). The environmental effects of leather products sub-sector (such as footwear) are marginal. Hence, in this study, only the leather processing sub-sector was considered to present the leather industry.

According to the Leather Sector Development Strategy, there are 28 organisations, which are involved in leather processing and leather product development (URT 2016a:25). Nine out of the 28 are directly involved in leather processing (URT 2016a:24).

3.4.2 The mining industry

Mining operations depend on the type of mineral and methods used to extract the minerals (American Geosciences Institute [AGI] 2018). For instance, mining from hard rock involves operations such as excavation of the ore from the rocks, waste rock extraction, size reduction of the ore, mineral concentration and waste treatment (IFC 2007a:30). While the mining operations aim at getting minerals with quality value, the aspect of waste management is vital for management of the environment. The IFC describes mining industry activities and provides guidelines to environmental health and safety (see IFC 2007a).

The potential environmental issues associated with the mining industry are: water use and quality, wastes, hazardous materials, land use and biodiversity, air quality, noise and vibrations, energy use and visual impacts (IFC 2007a:2).

The Tanzanian mining industry is classified by the size of operation of the organisation namely large-scale miners (LSM) and artisanal and small-scale miners (ASM). The ASM are not well regulated, and they use rudimentary mining technology, which poses serious environmental effects (URT 2014:14). The ASM have no formal record keeping; thus, they were not considered during this study. The URT government with the support of the World Bank is in the process of making the ASMs formal by establishing regulations to govern their activities and compliant with environmental regulations (URT 2014:14). Literature indicates that there are eight active LSM projects, nine projects at exploration stage and fourteen projects at a feasibility study stage in Tanzania (URT 2015). In this study, only the eight active LSM projects were considered.

3.4.3 Textile industry

The textile manufacturing process involves spinning of fibres into yarns (Slater 2003:40), weaving or knitting of the yarns into fabrics (Slater 2003:61), and wet processing of the fabric to suit various final product performances (Slater 2003:69; Lewin 1984:91). The spinning process involves the opening of fibre, aligning the fibres and then twisting the fibres to form a yarn. During spinning,

non-fibrous materials are removed from the bulk of the fibres, thus generating solid wastes. The fibre opening and spinning release dust and lint in the air, which could cause discomfort and impair breathing (Slater 2003:55).

Preparation for weaving or knitting involves treatment of the yarn with chemicals which reduce surface friction which in turn reduce yarn breakage during fabric construction. The chemicals used are called sizes and the process of applying such chemicals is called sizing (Drexler & Tesoro 1984:2). Once the fabrics have been formed, the sizes must be removed by a process called de-sizing (Drexler & Tesoro 1984:60). Both sizing and de-sizing generate waste water containing organic material, which impairs the microorganism activity if discharged into water streams without treatment (Connell 1995). After de-sizing the fabric is treated by a process called scouring to remove surface impurities which may impair with other wet treatments such as dyeing. Fabric scouring uses chemicals such as caustic soda, surfactants and detergents (Ellis 1995:249). Bleaching of fabrics uses bleaching agents such as sodium chloride and hydrogen peroxides, thus effluents from the bleaching process contain halogenated organic compounds, which are harmful to living organisms (Lewin 1984:93).

The dyeing process uses different types of dyes and auxiliary chemical compounds which affect the environment. For instance, the effluents from the dyeing of cotton fabrics is highly coloured and contain chemical compounds which affect living organisms (Teng & Low 2012). Generally, the effluents from textile wet processing and finishing may be strongly alkaline, coloured and at high temperatures, which have a negative impact on the environment (Slater 2003).

The 2012 report by the Textile Development Unit (TDU) under the Ministry responsible for Industry, Trade and Investment in Tanzania indicates that at the time, there were thirteen textile mills out of which only nine were active (Salm, Dinsdale, MacDonald, Martelli & Hill 2012:103). Therefore, in this research, nine organisations were considered under the textile industrial sector.

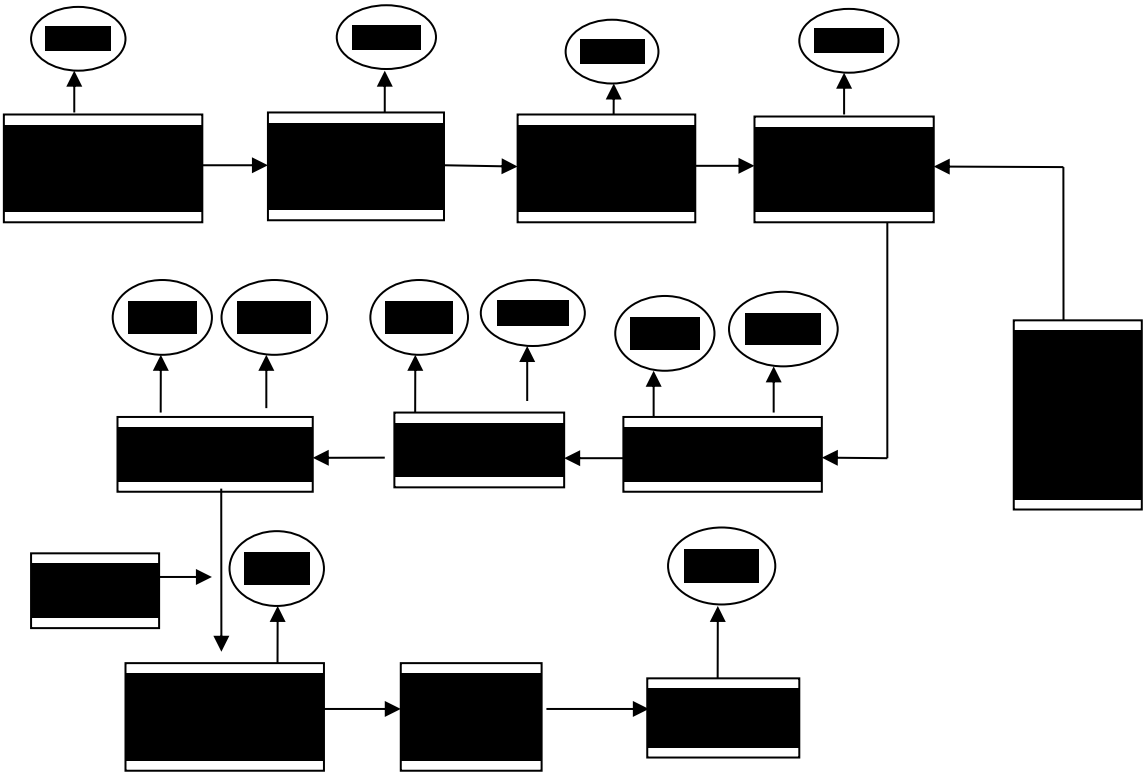
3.4.4 Cement industry

The raw material required for cement production (calcium carbonate, aluminium oxide, iron ore and silica) are usually extracted from limestone rock, clay, chalk or shale (Stajanča & Eštoková 2012:297; Zainudeen & Jeyamathan 2008:1410). These naturally occurring materials are extracted through mining and quarrying, which follows drilling, blasting and excavating (Habert 2013:4; Sharma, Jain & Singhal 2013). The extracted raw materials are crushed to reduce its size and thereafter are ground to produce fine raw materials. The raw material is then mixed and blended with additional minerals (such as paper ash) in order to ensure the correct chemical composition for making cement is maintained (Habert 2013:4). The fine powder produced in this process is known as the raw meal (IFC 2007c:15). The raw meal is preheated and then sent to a kiln for further processing (IFC 2007c:15).

In the kiln, the raw meal is heated at high temperature where chemical reactions take place to form clinker (Habert 2013:4). Immediately after exiting the kiln, the clinker is cooled and stored. In making cement, a small amount of gypsum (3–5%) is added to the clinker and the mixture is ground to produce a powder called cement. Various minerals (additives) may be added along with gypsum to give cement specific properties. Finally, the cement is stored in silos and then packed in bags and sent to final users (Habert 2013). The manufacturing process for cement is presented in a flow chart (see Figure 3.1).

The main environmental issues of the cement industry are land degradation, air emissions, energy consumption and fuel, waste water, solid wastes generation, and noise (IFC 2007c:2). In the cement production process, the air emissions consist of particulate matter and gaseous emissions (Sharma *et al*. 2013). Particulate matters are released from the quarry work, crushing and grinding of raw material, milling of clinker, handling of fuels and packaging of cement (IFC 2007c:2). The particulate matter remains suspended in the atmosphere in the form of dust, soot or liquid droplets. Some of the suspended matter may be

carcinogenic metals; hence, dangerous to human health if inhaled (Zhang, Chai, Zheng, Yang, Zhong, Fomba & Zhou 2018:2). Particulate matters impair visibility and affect air quality negatively (Zhao, Che, Zhang, Ma, Wang, Wang & Wang 2013:427).



Note: PM – particulate matter emission; Gas – gaseous emission

Figure 3.1 Process flow diagram for the manufacturing of cement

Source (Stajanča & Eštoková 2012:298)

Gaseous emissions are in the form of sulphur oxides (SO_x), nitrogen oxides (NO_x), carbon monoxide (CO), carbon dioxide (CO_2), hydrogen sulphide (H_2S), and volatile organic compounds (VOCs) (IFC 2007c; Oss & Padovani 2003:98; Zainudeen & Jeyamathan 2008:1411). Sulphur oxides (mainly sulphur dioxide (SO_2) and sulphur trioxide (SO_3)), which are formed by the oxidation of sulphur present in the cement raw material as well as in the fuel. While in air, Sulphur oxides (SO_x) is responsible for the acid rain, which causes damage to both flora

and fauna (DEFRA 2012:23). The nitrogen oxides (NO_x) come from the combustion of the products in the kilns and burning of fuels (Sharma *et al*. 2013; IFC 2007c:3). Nitrogen contained in the raw material and in fuels transforms into nitrogen oxides if heated at high temperatures. Emissions of nitrogen oxides (nitrogen dioxide (NO_2), nitrogen trioxide (NO_3) and nitrous oxide (N_2O) in the atmosphere contribute to acid rain, water pollution, GHGs and respiratory diseases in humans (DEFRA 2013:120). Burning of limestone and fuels results in carbon emissions in the atmosphere. Carbon emissions contribute to global warming and respiratory diseases (IFC 2007c:4).

The cement manufacturing process has an effect on both water and energy resources (IFC 2007c:2). A high amount of energy (both thermal energy and electrical energy) is required in cement production (Stajanča & Eštoková 2012:299). The literature indicates that energy cost represents 40% of the total production cost of cement (Stajanča & Eštoková 2012:299). The amount of water required in cement production depends on whether the process is wet or dry (Zainudeen & Jeyamathan 2008). Plants using wet processes use more water in producing a tonne of cement than plants using dry processes (Zainudeen & Jeyamathan 2008:1410). Even the consumption of energy is higher in wet processes than in dry processes because most of the energy is used in evaporating water (Stajanča & Eštoková 2012:299).

According to the Tanzania bureau standard (TBS 2016), there are five cement mills in Tanzania which are active. All five mills were considered in this research.

3.4.5 Sugar industry

The production of sugar involves extraction of sugar juice from sugar cane or beets and subsequent processing of the juice into sugar (IFC 2007g:10). Therefore, sugar mills are constructed near the cane fields for easy transportation of the raw material to the mills (The Sugar Association: no date). The raw material received from the field is taken into the washing process in order to remove any debris. The waste water from the washing process has a

high content of organic matter and may also contain crop pests, pesticide residues and pathogens (Lang, Schoen, Hashem, McDonald, Parker & Savelyeva 2017:121; Nagaraju, Narasimha & Rangaswamy 2009:1088). Cane juice is extracted from the cleaned canes or beets leaving out the bagasse (remains of cane stalk after extraction of cane juice) from canes or beet pulp respectively. The juice extraction process always results in emission of odours; hence, it is necessary to control the odour (IFC 2007g:5). The bagasse is used as a source of energy for the sugar factory whereas beet pulp is used as animal food (The Sugar Association: no date). Emissions into the air are mainly from the burning of the bagasse for the generation of energy. The sugar juice is processed through clarification, evaporation and crystallisation processes whereby milk of lime and carbon dioxide gas are added (IFC 2007g; The Sugar Association: no date). Lime sludge is the main waste from the clarification process. An evaporation process is done in order to increase the sugar concentration in the syrup to facilitate crystallisation. Molasses is the main by-product from the crystallisation process. Finally, the crystallised sugar is taken through various refining processes prior to packaging (IFC 2007g:10).

To summarise, the main environmental issues for the sugar industry are solid wastes and by-products, waste water and emissions into the air (IFC 2007g:2). The regulatory authority of the sugar industry in the country indicates that there are four sugar mills (SBT:2014) operating in Tanzania. Therefore, in this research, all four sugar mills representing the sugar industry were considered.

3.4.6 Steel manufacturing

Steel manufacturing involves mainly heating and forming the metals into various shapes. These processes cause environmental issues, such as air emissions, generation of noise, water and solid wastes (IFC 2007d:2; Jernkontoret 2017; Olmez, Dilek, Karanfil & Yetis 2016). Main sources of emissions are the burning of fuel, which is used for heating and melting of metals and the smelting and refining activities (IFC 2007d:2). Solid wastes are generated from grinding and

shaping processes and handling of raw material. Particulate matter may contain mineral and metal oxides, which are environmentally harmful. Some of the emissions from the heating and melting processes are nitrogen oxides, carbon dioxides, sulphur dioxides and dioxins and furans (Greenspec 2018; IFC 2007d:2; South East Asia Iron and steel Institute [SEAISI] 2008).

At the time of this study, there were thirteen active steel mills in Tanzania, which mainly processed imported steel bars into various steel shapes at the time (TBS 2016). In this research, all thirteen steel mills were considered.

3.4.7 Breweries industry

Production of beer starts by milling the cereals whereby the mixture of flour and husk known as grist is produced (Beeriety 2009; Siebenthal 2014). The grist is then transferred into a mash turn. In the mash turn, the gist is mixed with hot water in a process called mash conversion to form a mash. This process uses natural enzymes to break starch into sugar. The mash is then filtered to separate wort (a sweet liquid extracted after mashing) from solid mash. This process is referred to as lautering (IFC 2007b:13). The solid residue is usually sold for animal feed. The wort is then collected into a vessel for boiling and thereafter hops are added. Hops contribute to the taste of beer. After boiling, the wort is filtered and ready for fermentation. Before fermentation, the yeast is added to the wort. The yeast convert sugar from wort into beer. Therefore the beer is left to mature before it is packed (Beeriety 2009; IFC 2007b; Siebenthal 2014).

Environmental issues related to production of beer include use of energy. In the brewing process, both electrical and thermal energy are used. Likewise, high amounts of water are used when producing a beer (Olajire 2012:1). According to the IFC (2007b:3), four to seven litres are required to produce one litre of beer. Apart from producing beer, breweries use water for various purposes, such as heating and cooling, cleaning packaging vessels, cleaning vehicles, production machines and process areas, and as sanitary water (Olajire 2012:4).

Another environmental issue associated with the brewing process is the production of effluent. The effluent produced is mainly composed of organic material from process activities (Olajire 2012:4). The brewing process also produces liquids, such as the residual beer and weak wort (IFC 2007b:6). The source of residue beer is from process tanks, pipes, beer rejected in the packing area and broken bottles in the packaging area (Olajire 2012:5). Moreover, the production of beer generates various residues as spent grain, which can be sold as a by-product to the agricultural sector. Further, the brewing process emits odour and dust. The main source of odour comes from the wort boiling process, while the main source of dust emissions is the use and storage of grain and sugar (IFC 2007b:6).

In Tanzania, the breweries industry is operated by two companies: Tanzania Breweries Limited and Serengeti Breweries Limited. Tanzania Breweries Limited is a subsidiary of SABMiller, while Serengeti Breweries Limited is a subsidiary of East African Breweries Limited. Tanzania Breweries Limited has four branches operating, and Serengeti Breweries has three branches operating in the country. All two companies were included in the study.

3.4.8 Pulp and paper mills

Manufacturing of pulp and paper involves following these steps: raw material separation, pulp manufacturing, pulp bleaching and paper manufacturing (Pulpandpaper 2018). The main material used in pulp and paper manufacture is wood. Wood is the source of cellulose for paper production. Two additional components, lignin and hemicelluloses, are also found in wood. Other sources of fibre, such as bamboo, bagasse and straw may be used (IFC 2007j:18; Pulpandpaper 2018). When wood (logs) is used as raw material, the logs are required to be debarked and cut into manageable sizes, which is a necessary condition for the further treatment of wood. In the pulping process, the wood (raw source of cellulose) is broken down into pulp (Pulpandpaper 2018; Gavrilescu, Puitel, Dutuc & Craciun 2012:81). The pulp can be extracted using a chemical

process or a mechanical process (Bajpai 2012). In the chemical process, the heat and reactant are used to soften the wood. The mechanical process relies mainly on mechanical equipment to reduce wood into fibres. The end products produced by the two approaches have specific properties suited for diverse uses. These two approaches have implications in terms of the environment (IFC 2007j:18; Pulpandpaper 2018).

The pulp and paper-making process contributes to the pollution of water, air and land (Gavrilescu *et al*. 2012). Waste water discharge includes nutrients and dissolved organic matter, such as lignin, suspended solids (mainly from the pulping process, washing and bleaching, and from debarking residue) (Gavrilescu *et al*. 2012:83; IFC 2007j:2). Nutrient nitrogen and phosphorus cause eutrophication in receiving water bodies, such as lakes and rivers. On the other hand, ecological changes occur when organic matters are dissolved in water bodies (DEFRA 2013:123; IFC 2007j:2). In the process of pulp and paper manufacturing, nitrogen oxide, sulphur dioxide (SO_2) and carbon dioxide (CO_2) are all emitted into the air. As discussed earlier (see 3.4.4), nitrogen oxide (NO_2) and sulphur dioxide (SO_2) contribute to acid rain whereas carbon dioxide adds (CO_2) to climate change (DEFRA 2013:35,120). In addition, pulp and paper manufacturing involves significant production of solid waste. The solid waste includes bark from debarking of wood, inorganic sludge, and biological sludge from the water treatment (Gavrilescu *et al*. 2012:83; IFC 2007j:2).

In Tanzania, there is only one pulp and paper industry, namely; Mufindi Paper Mills and it was included in the study.

Table 3.3 shows the types of industries and their potential environmental issues and the number of organisations operating in Tanzania. Industries discussed as well as others such as fertilizers, glass manufacturing, plastics, pharmaceuticals, chemicals and chemical products, food and beverage, metal product are listed in Table 3.3.

Table 3.3: Type of industry and potential environmental issues

S/N	Category	Number of organisations in Tanzania and reference in brackets	Potential environmental issues
1	Breweries	2 (TBS 2016)	Solid waste, by-products, waste water, air emissions, energy consumption and water consumption (IFC 2007b)
2	Sugar manufacturing	4 (SBT 2014); (TBS 2016)	Solid waste, by-products, waste water and emissions into air (IFC 2007g)
3	Steel mills	13 (TBS 2016)	Solid waste, waste water, air emissions and noise (IFC 2007d)
4	Cement mills	5 (TBS 2016)	Air emissions, energy consumption, fuels consumption, solid waste generation and noise (IFC 2007c)
5	Textile mills	9 (Salm, Dinsdale, MacDonald, Martelli & Hill 2012)	Waste water, water consumption, energy consumption, emissions into the air, solid waste, liquid waste and handling of hazardous chemicals (IFC 2007i)
6	Leather industry	9 (URT, 2016a)	Odour, waste water, handling of hazardous chemicals and water consumption (IFC 2007h)
7	Fertiliser mills	1 (TBS 2016)	Waste water, hazardous material, air emissions and noise (IFC 2007f)
8	Pulp and paper mills	1 (TBS 2016) (Confederation of Tanzania Industries [CTI], 2016)	Waste water, air emissions, wastes and noise (IFC 2007j)
9	Mining	8 (URT 2015)	Water use, quality of discharged waste water, solid waste, hazardous materials Land use and biodiversity, air quality, energy use, visual impacts, noise and vibrations (IFC 2007a)

S/N	Category	Number of organisations in Tanzania and reference in brackets	Potential environmental issues
10	Glass manufacturing	1 (TBS 2016) (CTI 2016)	Emission into the air, energy consumption, waste water and solid waste
11	Plastics and rubber	34 (TBS 2016) (CTI 2016)	Air emissions, waste water and solid waste
12	Lubricants	2 (TBS 2016)	Air emissions, waste water, hazardous materials, waste and noise
13	Pharmaceuti-cals	6 (TBS 2016) (CTI 2016)	Air emissions, waste water, solid waste, hazardous waste, hazardous materials and threat to biodiversity
14	Chemical and chemical products	21 (TBS 2016) (CTI 2016)	Air emissions, waste water and handling of hazardous chemicals,
15	Energy, electrical machinery equipment and electronics	15 (TBS 2016) (CTI 2016)	Hazardous materials used, energy consumption, waste water, waste and noise
16	Food and beverage	178 (TBS 2016) (CTI 2016)	Solid waste, by-products, water consumption and energy consumption
17	Metal product	20 (TBS 2016) (CTI 2016)	Air emissions, waste water, hazardous materials and noise (IFC 2007e)
18	Paper products, printing and packaging	38 (TBS 2016) (CTI 2016)	Emission into the air, waste water and hazardous material handling.
19	Retail petroleum networks	14 (EWURA 2016)	waste management, emissions into the air, Leaks and spills waste water,
20	Tobacco processing and products	3 (TBS 2016) (CTI 2016)	Emission into the air, energy consumption and odour

S/N	Category	Number of organisations in Tanzania and reference in brackets	Potential environmental issues
21	Water supply and sanitation services	130 (EWURA 2016)	Water consumption, emission into the air, odour and waste water
22	Health centres and hospitals	237 (URT)	Waste management, emissions into the air and waste water discharges

S/N= serial number

3.5 CHAPTER SUMMARY

The Tanzanian industrial sector passed through various phases of development and challenges since independency. Various initiatives and strategies have been employed by government to rescue the sector and ensure its existence. The Tanzania Development Vision 2025 is the latest strategy that has been implemented by government in 1999. Its purpose is to transform the country by 2025 from a weather-dependent economy to a self-sustaining semi-industrial economy.

Various sectoral legislations with environmental safeguards are available. Some are specific to the sector and others are cross-cutting. Therefore, each organisation operating in Tanzania is required to comply with legislations that are directly applicable to it and other legislations, which are cross-cutting in terms of the organisation.

In the same way, various industries operate in Tanzania. The industries operating in Tanzania comprise textile, cement, mining, pulp and paper mills, chemical and chemical products and many other. The activities of these industries have a significant environmental impact, such as land degradation, emission into the air, solid waste and waste water generation, odour, and dust emission. Furthermore, these industries consume resources, such as energy,

water and raw materials in their production processes, which if not controlled, could lead to depletion of natural resources.

Despite the good initiatives taken by government to promote the industrial sector, little has been done so far to protect the environment in which these industries operate. Even though the provision of EMA of 2004 requires all projects implemented in Tanzania to conduct EIAs, the EMA of 2004 is silent on issues related to environmental reporting by the organisations operating in Tanzania. Industries operating in Tanzania have a significant environmental impact, and if the impact is not controlled it will lead to environmental degradations. It was therefore thought that a framework is required to ensure that organisations operating in Tanzania commit sustainable development and environmental protection in their business strategies and disclose their environmental information.

The next chapter presents the theoretical framework for the study. The theories that explain the rationale for environmental reporting are also discussed.

CHAPTER 4

THEORETICAL FRAMEWORK

4.1 INTRODUCTION

As indicated in Chapter 2 (see section 2.3), studies on how environmental aspects of organisations are presented in annual reports have been the interest of numerous researchers. For instance, studies on the extent of environmental reporting are published, see for example (Ashcroft 2012; Uwuigbe & Jimoh 2012). Some studies considered the exploration of the determinants of voluntary environmental reporting (Burgwal & Vieira 2014; Cormier *et al.* 2005; Elijido-Ten 2004; Hackston & Milne 1996; Jindal & Kumar 2012; Liu & Anbumozhi 2009; Lu & Abeysekera 2014; Souhir & Chedli 2010; Suttipun & Stanton 2012a; Zhang 2013), while yet other studies investigated the relationship between firm attributes and environmental reporting (Filbeck & Gorman 2004; Hackston & Milne 1996; Khondkar *et al.* 2006; Liu & Anbumozhi 2009; Lu & Abeysekera 2014; Pahuja 2009; Smith *et al.* 2007). In the reported studies, the researchers used different theoretical perspectives to explain the existence of environmental disclosure and motives for disclosure of the environmental aspects of the organisation. The important thing to realise is that the choice of theoretical perspective to explain environmental reporting remains the researcher's choice and his or her knowledge about the theory.

The present study examined the extent of environmental reporting in the annual reports of Tanzanian organisations. Environmental reporting can be viewed as a strategy implemented by organisations to satisfy environmental expectations of various stakeholders (Cowan 2007:29). Based on the stakeholder theory, organisations may use environmental disclosure to convey information of their activities, products and services related to the environment to meet the expectations of their stakeholders. According to the legitimacy theory, the organisation may use environmental disclosure as a strategy to gain acceptance to operate from its surrounding community (Wilmshurst & Frost 2000:11).

However, according to the institutional theory, the organisation may decide to disclose environmental information not for economic reasons or legitimisation but may be influenced by the performance of other organisations or they may decide on it due to the presence of relevant regulations governing the disclosure (Cormier *et al*. 2005:5)

This chapter therefore, presents the theoretical background of the study. The chapter starts by providing a general overview of the theories of corporate environmental disclosure. Later, the theories used in social accounting, namely political economy theory, legitimacy theory, stakeholder theory and institutional theory are reviewed. The theoretical framework covers the selected four theories because they are most commonly used in environmental disclosure and reported in similar studies in the literature.

4.2 THEORIES OF CORPORATE ENVIRONMENTAL DISCLOSURE

Studies on social and environmental disclosure use various theories to describe reporting practice. So far, there is no comprehensive social and environmental theory, which can provide an explanation to environmental reporting (Tilling 2001 as cited in Amran & Devi 2007:23). However, three social theories dominate the field of social and environmental studies, i.e.

- **political economy theory** (Amran & Devi 2007);
- **legitimacy theory** (Behram 2015; Branco *et al.* 2008; Deegan & Gordon 1996; Deegan & Rankin 1996; Gray, Kouhy & Lavers 1995b; Ienciu 2014; Magness 2006; Nurhayati, Taylor, Rusmin, Tower & Chatterjee 2016; O'Donovan 2002; Patten 1992; Tilling & Tilt 2010); and
- **stakeholder theory** (Elijido-Ten, Kloot & Clarkson 2010; Liu & Anbumozhi 2009; Roberts 1992; Uwuigbe & Jimoh 2012).

Social theories assume the existence of a social contract between the organisation and the social world (Deegan 2002:292). The primary goals of organisations should not only be to maximise profit, but also to be responsible in terms of the environmental effects of their activities on society (Shocker & Sethi

1973 as cited in O'Donovan 2002:344). O'Donovan (2002:345) argues that these theories are still evolving, and the distinction between them is often unclear. He further argues that all these theories interplay between the corporation and its stakeholders. Apart from social theories mentioned, other studies used theories, such as institutional theory (Ali & Rizwan 2013; Amran & Devi 2008) and voluntary disclosure theory (Clarkson *et al.* 2008) to explain the motive behind environmental reporting. These theories differ depending on the perception of the reader. However, Suttipun and Stanton (2012a:101) point out that, due to the complexity of disclosure and overlapping of disclosure theories, environmental disclosure cannot be explained by one theory. As a result, a multi-theoretical framework was applied to explain environmental and social reporting (Bhattacharyya 2014; Cormier *et al.* 2005; Fatima, Abdullah & Sulaiman 2015; Hossain, Rowe & Quaddus 2012; Hossain, Alam, Islam & Hecimovic 2015; Islam & Deegan 2008; Liesen, Hoepner, Patten & Figge 2015; Lu & Abeysekera 2014).

In Tanzania, there are few organisations that have been listed on the Dar es Salaam Stock Exchange (DSE) and even for those listed, environmental reporting is not among the listing requirements (DSE 2018). Therefore, it is thought that organisations operating in Tanzania may decide to report environmental information to gain acceptance within society (which is explained by social theories). However, the reporting of environmental information may not necessarily be for legitimisation purposes, but the organisation may decide to report environmental information because other organisations working in the same industry are reporting, or because the organisation itself has been reporting in the past or due to the presence of relevant regulations governing the disclosure (which is explained by institutional theory). As pointed out earlier, due to the complexity of disclosure and overlapping of disclosure theories, environmental disclosure cannot be explained by one theory. These theories have been developed from similar theoretical under pinning and they complement to each other (Islam & Deegan 2008:853). This study therefore adopts the multi-theoretical perspective in explaining the environmental reporting

practices in Tanzania. A brief review of the theories and their application is presented in the subsequent subsections.

4.2.1 Political economy theory

The political economy theory emphasises the fundamental interrelationship between political and economic forces in society (Miller 1994 as cited in Van der Laan 2009:17) and recognises the effect of accounting reports on the distribution of income, power and wealth (Cooper and Sherer 1984 as cited in Van der Laan 2009:17). The political economy theory recognises accounting as a tool for constructing, sustaining and justifying economic and political arrangements, institutions and ideological themes, which contribute to the private interest of the organisation (Hughes, Sander & Reier 2000:142). In particular, the political economy theory recognises that organisations can use disclosure as a means of managing their stakeholders (Adler & Milne 1997:4) and as a strategic tool in attaining the organisational goals (Guthrie and Parker 1990 as cited in Cowan 2007:63). According to this perspective, managers are free to tell their story or avoid doing so depending on their own self-interest (Guthrie & Parker 1989:351). According to Omran and El-Galfy (2014:259), political economy theory extends its usefulness by not focusing solely on wealth maximisation and economic self-interest as an organisational goal but also by defining the interaction between policy, production and regulatory forces within society. In addition, the inclusion of environmental information in the annual report is among strategic tools used in manipulating the attitude of stakeholders and attaining organisational goals (Guthrie and Parker 1990 as cited in Cowan 2007:63). As a result, annual reports may be considered a tool used by organisations to maintain the corporate image (Amran & Devi 2007:23). Taking into consideration this perspective of the political economy theory, there is a danger for organisations disclosing environmental information under the theory to provide only minimum information, as the aim is to protect the interests of the organisation and avoid further regulatory intervention (AbuRaya 2012:134). Therefore, the political economy theory may successfully explain voluntary disclosure as long as the organisation

intends to protect its interests, which might be endangered by societal expectations.

Political economy theory can be classified in terms of classical and bourgeois perspectives (Gray, Owen and Adams 1996 as cited in Hanafi 2006:114). The classical political economy recognises the role of the state, and depicts that conflicts and structural inequality are caused by the presence of classes with different interests in society (Gray *et al*. 1996 as cited in AbuRaya 2012:134). Under this perspective, the information in the accounting reports favours those who have direct control of the scarce resources, leaving out the rest (Deegan 2013 as cited in Omran & El-Galfy 2014:259). Further, it is argued that corporate annual reports are deployed as a mechanism aimed at influencing the allotment of income and wealth, in order to maintain the existence of the organisation (Omran & El-Galfy 2014:264). Consequently, Gray *et al.* 1996 as cited in AbuRaya (2012:134) argue that classical political economy does not provide a remarkable account of environmental and social reporting practices; however, it provides insight by those trying to explain mandatory disclosure.

Unlike the classical political approach, the bourgeois political approach perceives the world as pluralistic where the existence of the powerful group in society is ignored, and the focus is on group interaction as a whole (Gray *et al*. 1996 as cited in Hanafi 2006:114). Therefore, the reports are prepared to cater for all groups. In this view, corporate and environmental reporting practice can be explained better by bourgeois political economy theory than by classical political economy theory. In accounting disclosure literature, the stakeholder and legitimacy theories are considered to be within a bourgeois political economy perspective (Deegan, Rankin & Voght 2000 as cited in Omran & El-Galfy 2014:264).

4.2.2 Legitimacy theory

The legitimacy theory is widely been referenced in social and environmental reporting studies. Suchman (1995:574) defines legitimacy as “a generalised

perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs, and definition". Under legitimacy theory, the value or actions of a firm need to match the social value, and therefore organisations perform environmental disclosure with the mission to achieve societal authenticity to operate (Lu & Abeysekera 2014:9; Uwuigbe & Jimoh 2012:74). Organisations may disclose information such as –

- the activities carried out by the organisation and their effects on the natural environment;
- the measures (quantitative and qualitative) taken by the organisation to decrease or remove those effects on society; and
- the metrics used by the organisation to establish the effectiveness of the set strategies (Dowling & Pfeffer 1975).

By reporting the environmental activities, the organisation attempts to reveal how its behaviour is within the norms and the values of which it is part; hence, the organisation is said to have achieved a legitimacy to operate in society (Dowling & Pfeffer 1975:122). Legitimacy is achieved when the values of the organisation is congruent with the values of society but legitimacy is threatened by a lack of congruency between the organisation and society (AbuRaya 2012:135). Therefore, the focus of this theory is the contract whereby the firm has a contract with society as a whole (Ali & Rizwan 2013:593; Deegan 2002:293; Samkin & Schneider 2010:261). Society has certain expectations and these expectations keep changing over time (Suttipun & Stanton 2012b:20). Unless the expectations of society are met, the organisation is considered not legitimate. If the organisation does not comply with societal expectations, society may withdraw the support needed to ensure the continued existence of the organisation by consumers reducing or stopping the demand for its products, stopping supplying resources, such as financial capital and labour and legal restrictions on its operation may result (Deegan & Rankin 1996:54). Consequently, the survival of an organisation depends on its ability to meet the expectations of society

(Magness 2006:541), and only legitimate organisations have a right to utilise resources surrounding society (Ali & Rizwan 2013:593). The expectations of society are both implicit and explicit, and describe explicit terms of the social contract as legal requirements, while implicit terms refer to non-legislated social expectations (Deegan 2006, as cited in Cowan 2007:71).

It is argued that the legitimisation process is done in order to create or expand legitimacy, maintain the level of current legitimacy, or repair a legitimacy whose reputation is lost (O'Donovan 2002:346). According to Ashforth and Gibbs (1990:182), legitimacy is created by organisations which are either in the early stages of development, getting into a new sphere of activities, or in a change of technological processes. During this stage, competitiveness, professionalism and compliance to a standard of quality are the key expectations of society. O'Donovan (2002:349) further points out that, for organisations that attempt to create legitimacy, legitimating activities would tend to be intense and proactive so as to gain the confidence and support of society.

According to Ashforth and Gibbs (1990:183), efforts to maintain legitimacy occur when the organisation has attained a minimum level of approvals adequate for ongoing activities. Organisations at this stage are expected to be reactive to society because societal expectations keep changing over time. In addition, the attempts by an organisation to maintain legitimacy should involve a forecast of changes, continuous observations of current changes, and protection of past achievements (Suchman 1995:594).

Ashforth and Gibbs (1990:183) argue that an organisation may attempt to repair or defend its legitimacy when its existing legitimacy is threatened or challenged. Therefore, the activities for repairing or defending legitimacy will be strongly reactive to counteract the existing threats or challenges (Ashforth & Gibbs 1990:183). A good example of repair legitimacy is found when the organisation uses environmental disclosure to restore its image due to a crisis, which had turned the societal perception against the organisation. For instance, the

organisation may disclose information, which aims to counteract negative news which exists among the public (Deegan 2002:297). Furthermore, in order to repair damaged legitimacy, the organisation may report those items, which give strength to the organisation and ignore information with negative image (Deegan 2002:297).

Generally, the organisation may choose to use legitimacy theory reactively or proactively. The choice will depend on the nature of the situation reported (Lu & Abeysekera 2014:428). The reactive approach is found when an organisation decides to remain silent until faced with a crisis or negative change in public perception about the organisation before responding. A proactive approach organisation is found when an organisation adopts a disclosure strategy initiative that aims at getting or maintaining support from society early before faced with a crisis (van Staden & Hooks 2007:197). From such standpoint, corporate behaviour may be categorised as either social responsibility or social responsiveness. Social responsibility is referred as 'prescriptive' to mean a reactive adaptation and responsiveness as anticipatory, and 'preventive' to mean it as proactive adoption (Sethi 1975).

Substantive management and symbolic management were reported by Ashforth and Gibbs (1990:178) as the ways that may be used by organisations to seek legitimacy. Substantive management entails real change in organisational missions, visions and technology (Ashforth and Gibbs 1990:178). Symbolic management, on the other hand, involves an attempt by organisations to describe their activities in a way that would match norms and values of society without any real change of the behaviour of the organisation (Ashforth and Gibbs 1990:180). Ashforth and Gibbs (1990) argue that the choice of strategy will depend on the type of legitimacy sought by the organisation. They further argue that managers will prefer symbolic rather than substantive assurance because symbolic assurance preserves flexibility and resources.

O'Donovan (2002:347) opines that organisational legitimacy is dynamic since it is built on social perception and varies with time. This implies that it is not easy to determine the status of an organisation's legitimacy. He further argues that societal expectations and organisation actions should be congruent. Any deviation will result in legitimacy gaps. It has been suggested by Wartick and Mahon (1994:302) that legitimacy gaps may arise due to the following;

- a change in organisation performance while society's expectations of organisation performance remain unchanged and vice versa; and
- both the organisation's performance and society's expectation change with different magnitudes and directions.

The literature further suggests that organisational legitimacy can be affected even if there is no change in organisation activities. Such effects may be due to changes of society composition and values. Changes in society values may be due to changes in social awareness, regulatory systems, pressure from media and many other (O'Donovan 2002:348).

As discussed above, the concept behind the legitimacy theory is the social contract between the organisation and society from where the organisation operates. The right of the organisation to exist in society will depend on its compliance on the implied social contract (Magness 2006:542). Deegan and Rankin (1996:54) argue that unless the organisation complies, the contract is deemed revoked. According to Lindblom (1994 as cited in Deegan 1996:297), the congruence between social values and the organisation can be created or maintained by the organisation taking the following initiatives, namely to –

- inform the stakeholders about actual changes in the organisation's performance and activities;
- change the perceptions of the stakeholder but not change organisation's actual behaviour;
- manipulate perception by deflecting attention away from the issue of concern to other related but appealing issues; and

- change external expectations of organisation performance.

Therefore, during environmental reporting, either all or some of the mentioned initiatives may apply. The question of which strategy or strategies should be followed by the organisation during reporting will depend on the expectations and perceptions of society and the way the organisation responds to these expectations and perceptions (Deegan 2002:296). In addition, O'Donovan (2002:349) claims that the choice of the strategy and disclosure reaction depends on the type of legitimacy, which the organisation wants to achieve.

4.2.3 Stakeholder theory

The stakeholder theory is related to legitimacy theory because they all aim at meeting the expectation of groups, which may influence the existence of the organisation (Suttipun & Stanton 2012:101). However, while legitimacy theory seeks to meet the expectations of society in general, stakeholder theory seeks to meet the expectations of a specific interest group (Ali & Rizwan 2013:594; Lu & Abeysekera 2014:428). The stakeholder theory points out that in order for the organisation to keep on with its economic activity (hence survival), it needs consent and support from the stakeholders (AbuRaya 2012:138). It must be noted that stakeholders could influence the allocation of resources, hence the activities of an organisation (Ullmann 1985:552). Therefore in order for the organisation to be endorsed to operate, its activities must be in line with the stakeholders' expectations (Liu & Anbumozhi 2009:594). Therefore, the theory emphasises the relationship between the activities of the organisation and the stakeholders and the impact on organisations' stakeholders. Under stakeholder theory, the organisation may have more than one social contract depending on the type and nature of the stakeholder (Lu & Abeysekera 2014:9). Thus, when a poor relationship exists between the organisation and stakeholders, the existence of the organisation is at risk due to disapproval by the stakeholders. This argument is in line with the argument made by Mitchell, Agle and Wood (1997:859) that the survival of the entity will depend on its ability to satisfy the

demands of its various stakeholders. In terms of the stakeholder theory, organisations are expected to identify stakeholder groups depending on the level of effect that the organisation may cause to each of the stakeholders and vice versa. Therefore, the efforts made by the organisation to forge the relationship with the stakeholder will depend on how important the stakeholder is to the organisation (AbuRaya 2012:138). The relationship is managed by providing the stakeholders with information through voluntary social and environmental disclosures (AbuRaya 2012:138). By providing such information, the organisation gets approval from the stakeholders.

The stakeholders of the organisation may be from different groups, such as customers, suppliers, employees, creditors, competitors, public interest groups, local communities, government bodies, stock market, industry bodies, national and international society and the general public (AbuRaya 2012:140). Each of these stakeholders has different effects on the activities of the organisation and each expects that its expectations will be fulfilled in return for what they supply to the organisation. Thus, the level of success of the organisation will depend on the extent to which the organisation satisfies the demands of its stakeholders (Ullmann 1985:552). Ullmann (1985:552) points out that the way an organisation manages its stakeholders depends on the strategic posture adopted, i.e. active or passive. An organisation with an active posture may seek to influence its important stakeholders by displaying a high level of environmental reporting. However, despite high stakeholder power, organisations displaying a passive posture may opt for low levels of environmental reporting (Ullmann 1985:554).

Stakeholder theory can be identified into two branches, namely normative (ethical) and managerial (Ali & Rizwan 2013:594). The **normative** branch assumes that all stakeholders have certain intrinsic rights which must be fulfilled by the organisation (AbuRaya 2012:141). Therefore, the normative branch requires the organisation to work for the benefit of all stakeholders; hence, being accountable to a wide group of stakeholders (Ali & Rizwan 2013:594). According to normative perspectives, all stakeholders of an organisation has an equal right

to the organisation information, and environmental and social information is equally disclosed to all stakeholders (Ali & Rizwan 2013:594).

On the other hand, according to the **managerial** branch of the stakeholder theory, the organisation recognises only those stakeholders who have significant power to influence the performance of the organisation. Their influence depends on the resources they held to influence the performance of the organisation (Polonsky 1995; Ullmann 1985). According to the managerial perspective (see AbuRaya 2012:142), managers tend to devote their time to a stakeholder who has a strong influence on the organisation as different stakeholders have different expectations.

Moreover, stakeholders can be classified as primary or secondary, internal or external, owners or non-owners, owners of capital or owners of less tangible assets, those existing in a voluntary or those in an involuntary relationship with the organisation, resource supplier to or dependants of the organisation, and actors or those acted upon (AbuRaya 2012:140). The influences of stakeholders upon the organisation vary as some may have more influence than others (AbuRaya, 2012:140). Despite various stakeholder classifications as mentioned, the most useful differentiation in managerial perspective is that of primary and secondary stakeholders.

Primary stakeholders are stakeholders who are recognised by organisations and who have direct influence on the performance of organisations (Thomlison 1992 cited in Polonsky 1995:35). Primary stakeholders comprise the groups of people (such as shareholders, managers and employees, creditors, suppliers, community stakeholders, customers and regulatory stakeholders) without whose continuing cooperation an organisation cannot continue to exist. These stakeholders possess a stake in the organisation (Donaldson and Preston, 1995 as cited in AbuRaya 2012:140). For instance, shareholders offer the firm capital expecting to get a satisfactory risk-adjusted return and stock market value appreciation over time. On the other hand, creditors provide the firm with finance

expecting to be paid back on time. Employees and managers offer human capital, skills and time to the organisation expecting to get a reasonable income and a satisfactory working environment. On the other hand, customers supply income for the organisation expecting to get value for money in exchange. Regulatory stakeholders, especially government bodies, influence the business by putting pressure on organisations to ensure that they operate in an environmentally responsible manner (AbuRaya 2012:140).

Secondary stakeholders, on the other hand, are not essential for survival of the firm, and they do not engage in transactions with the firm; however, they have influence on or are influenced by the organisation (Polonsky 1995:35). Generally, these stakeholders (comprising the general public and the media) do not directly transact with an organisations (Mitchell *et al.* 1997:857); however, they can aid or harm an organisation by influencing primary stakeholders. For instance, media could influence society to support or go against the environmental performance of an organisation (AbuRaya 2012:141).

4.2.4 Institutional theory

Institution theory attempts to explain how pressures from stakeholders may had influenced an organisation to adopt existing practice in place. It is used to explain why there has been a degree of correspondence between institutional practices used within different organisations (Islam & Deegan 2008:856). Under environmental accounting, institutional theory assumes that the adoption of an environmental reporting strategy by the managers of an organisation may not be for economic or legitimacy reasons (Cormier *et al*. 2005:5). The decision to report environmental information may be influenced by the performance of other organisations in the same industry, or by what the organisation did in the past, or due to the presence of relevant laws and regulations governing disclosure (Cormier *et al.* 2005:5). Thus, according to Deegan 2009, cited in Ali and Rizwan (2013:595), the institutional theory offers justification for the adoption of certain organisational practices or traditions within a particular organisational area. Hall

1996 cited in Cormier *et al.* (2005:12) points out that the aim of institutional theory is to provide explanations as to why particular organisations evolve in a specific way. Institutional theory provides explanations about why there are similarities in practices among organisations. It is therefore argued that when an organisation depends on another organisation it is likely that such organisation will become similar to the other organisation in terms of behaviour, climate and structure (DiMaggio & Powell 1983:154).

Generally, the institutional theory is embedded with the concept of isomorphism. Isomorphism is defined as "a constraining process that forces one unit of population to resemble other units that face the same set of environmental conditions" (DiMaggio & Powell 1983:149). According to Dillard, Rigsby and Goodman (2004:509), isomorphism "refers to the adaptation of an institutional practice by an organisation". Therefore, isomorphism can be referred to as a process whereby an organisation implements the institutional practice of another organisation. Isomorphism provides explanations about why organisations, despite their difference in operating technology, still become homogenous in their structures (DiMaggio & Powell 1983:154). Literature indicates that isomorphism can be classified as coercive, mimetic and normative (DiMaggio & Powell 1983:154).

Under **coercive** isomorphism, an organisation may become under pressure from another organisation which it depends upon, or from society within which the organisation operates or from laws and regulations, which force organisations to adapt certain institutional practice (Amran & Devi 2008:391). For example, an organisation may decide to conform to environmental regulations by adopting new pollution control technology. Such organisation may decide to adhere to legal and technical requirements, such as environmental audit and annual reports preparations in order to influence organisational environmental reporting behaviour. In coercive isomorphism, the influence of an organisation to adapt certain institutional practices (for instance environmental reporting) to resemble other organisations working in similar institutional environments will depend on

the power of the stakeholders (Ali & Rizwan 2013:595). Therefore, the power of the stakeholders plays a significant role to ensure that the organisation is adapting the best practices of a certain organisation.

Mimetic isomorphism is the tendency of an organisation's readiness to copy or imitate the organisational practice (e.g. environmental disclosure) of other organisations assuming that the imitation is justifiable and useful (DiMaggio & Powell 1983:151). The imitation may diffuse unintentionally, indirectly via employee turnover or transfer, or by consulting directly with the firm or industry associations (DiMaggio & Powell, 1983:151). Dillard *et al.* (2004:509) clarify that, in mimetic isomorphism, an organisation attempts to imitate organisations, which they perceive to be successful or legitimate. This may happen when imitating organisations is not well understood or when organisational goals are vague or due to a lack of guidance in organisation's own environment. An organisation may make a decision to copy the best practice in order to resemble another organisation working in a similar industry or to meet the industry standard and norms (Ali & Rizwan 2013:596). Therefore, the modelled organisation may not be aware of the influence of its own actions on another organisation. As a result, the reporting of environmental information may become uniform among different organisations operating in the same industry. By adopting the good practice of an organisation in an industry will shape the societal expectation about organisation performance (Deegan 2009 cited in Ali & Rizwan 2013:596). Therefore, society will demand other organisations working in the same industry to act in the same responsible way. Failure by an organisation to follow the desired practice could be perceived as risky (Ali & Rizwan 2013:596).

Normative isomorphism is linked with the concept of professionalisation, which is a collective way to define how members should work in a certain profession (DiMaggio & Powell 1983:153). DiMaggio and Powell (1983:153) aver that normative isomorphism results when an organisation tries to conform to a world view according to which transformation occurs as a result of development and communication of such a world view by peers. The authors further contend that,

despite the presence of various categories of professionals within the firm which differs from one organisation to another organisation show signs of similarity to their professional counterparts in other organisations. Moreover, Amran and Devi (2008:391) maintain that professionalisation has two important factors that could lead to isomorphism, i.e. education and a professional network. They claim that training centres and universities are the most important places where normative pressure could build up. In the same way, Shabana, Buchholtz and Carroll (2017:1110) stipulate that universities and training networks may spread the knowledge on corporate social and environmental reporting to organisations, and the practice could become normatively approved. Therefore, corporate social and environmental reporting could be developed as a cognitive base created by professional training institutions and universities and incorporated as the norm among professional managers and their employees.

Shabana *et al*. (2017:1109) link the three types of isomorphism with a three-stage model of reporting. In the first stage of reporting termed **defensive reporting**, organisations tend to report social and environmental reporting due to the gap existing between the expectations of the stakeholders and the actual performance of the organisations. In this stage, organisations fail to meet the expectations of their stakeholders due to the poor performance of the firm, and reporting is intended to close the gap between performance and expectations. For instance, the Exxon Valdez oil spill incidence (see Mambra 2018) accelerated social and environmental reporting as stakeholders had expectations that the organisation could operate in a sustainable way. Therefore, failure to protect the environment (i.e. to meet stakeholders' expectations) made the organisation use social and environmental reporting as a mechanism to regain legitimacy (Suttipun & Stanton 2012b:18). The impact of the Exxon Valdez oil spill extended further to even organisations in the same industry that experienced no negative events, as organisations found that they are required to produce a social and environmental report as a defence against negative public perception (Magness 2006:543). This process of an organisation trying to

defend its legitimacy against the negative event is referred to as **coercive isomorphism**.

In the second stage, termed **proactive reporting**, the knowledge of social and environmental reporting increases, and the practice of reporting becomes normatively approved (Shabana *et al*. 2017:110). In this stage, the practice is taken as a new opportunity for organisations to achieve their goals (Shabana *et al*. 2017:1110). Therefore, both universities and training networks disseminate knowledge to managers who build up similar standpoints and come to recognise the practice to be normatively sanctioned (DiMaggio & Powell 1983:153). Thus, managers discuss this new opportunity with others in their network and lastly incorporate it into their goals. The mechanism underlying the second stage is referred to as **normative isomorphism**.

In the third stage, termed **imitative diffusion**, reporting is done not with the intention to attain an organisational goal but to benchmark with the firm that the manager considers to be its peers (Shabana *et al*. 2017:1110). Thus, managers may wish to imitate firms in their field that are perceived to be legitimate and successful (Dillard *et al*. 2004:509). The mechanism underlying this third stage is referred to as **mimetic isomorphism**.

4.3 CHAPTER SUMMARY

In this research multi-theoretical perspective was adopted to explain the environmental reporting practices in Tanzania. The choice of multi-theoretical framework was driven due to the complexity and overlapping of disclosure theories. Environmental disclosure cannot be explained by one theory because these theories have been developed from similar theoretical under pinning and they complement to each other. Therefore, in this chapter, four theories that explain motives behind environmental reporting were discussed, namely political economy theory, stakeholder theory, legitimacy theory and institutional theory.

Political economy theory emphasises the interrelationship between political and economic forces and recognises the effect of accounting reports on the

distribution of income wealth. In particular, the theory does not solely focus on wealth maximisation but also considers social and institutional frameworks within which the economy takes place. Its two branches, i.e. classical political economy theory and bourgeois political economy theory give two different perspectives on how this is perceived within society. While classical political economy theory recognises the existence of classes and conflict within society, the bourgeois political economy theory does not recognise the classes within society.

Legitimacy theory provides a means for the organisation to get consent from the society to pursue their economic activities, and the survival of the organisation depends on whether it operates within the norms and values of society. The congruence between the activities of the organisation and societal expectations is important although the expectations of society keep changing over time. Therefore, organisations are expected to observe or anticipate change and protect past accomplishments if they want to maintain their legitimacy. However, when legitimacy theory is used in voluntary environmental disclosure, the dimension of disclosure is at the discretion of the reporting organisation. Literature expresses concern that when using legitimacy strategies, there is a chance that the organisations would report only positive information and hide negative information.

While the focus of legitimacy theory is to meet the expectations of the society in general, stakeholder theory focuses on the expectations of particular interest groups. The target of the organisation is to meet the expectations of the stakeholders without whose support the continued existence of the organisation will be at risk. The strongest group of stakeholders will be considered first as it can control the resources that are critical for the survival of the firm. Therefore, the organisation needs the consent from the strongest group (the primary stakeholders) for its survival. However, the weak group (i.e. stakeholders who have no direct influence on organisational survival) needs to be considered by the firm as they can benefit or damage the firm through their influence on primary stakeholders.

In terms of institutional theory, environmental reporting is done not for economic or legitimisation purposes. The decision to provide environmental information may be influenced by the performance of other organisations in the same industry, or by what the organisation has done in the past or due to the presence of relevant laws and regulations governing disclosure. The aspect underlying institutional theory is isomorphism. Isomorphism is classified into three types: coercive, mimetic and normative isomorphism. Coercive isomorphism occurs when pressure is exerted on the organisation by another organisation which it depends upon. Mimetic isomorphism is found when an organisation is ready to copy or imitate the organisational practice of other organisations as long as the imitation is justifiable and beneficial to the organisation. Normative isomorphism is found when the organisation tries to conform to a world view in which transformation occurs as a result of development and communication of such world view by peers.

The next chapter presents a discussion of the methodology and design of the study. The chapter will start by introducing research philosophies, followed by the research design used in this study.

CHAPTER 5

RESEARCH DESIGN

5.1 INTRODUCTION

The earlier chapters covered the literature review and theoretical framework of the study. Reviewing pertinent literature and outlining the proposed theoretical framework assisted in selecting the methodology for the study and constructing the appropriate research design that had to provide an answer to the research objectives and questions (see section 1.3) of the study. The present study had mainly three objectives. Firstly, it was aimed to develop a disclosure index to measure the extent of environmental reporting in Tanzania (see section 1.3), and secondly, to develop an environmental reporting framework (see section 1.3), and thirdly, to investigate the current feasibility and applicability of applying the reporting framework (see section 1.3).

The chapter starts with a discussion of the choice of research philosophy. The benefit of combining qualitative and quantitative perspectives is presented. The detailed discussion on the process and method used in the development of the environmental disclosure index is provided. Furthermore, the chapter provides explanations of how the extent of environmental reporting is determined. The chapter also provides substantiation for using content analysis as a method of assessing the extent of environmental reporting. The chapter continues with an explanation of how the coding process and its reliability together with validity of disclosure index were done. The chapter further gives explanations of the sample selection process (i.e. the organisations that were included when determining the extent of environmental reporting in Tanzania). Finally, the chapter presents details on how the environmental reporting framework was developed and how it was tested.

5.2 RESEARCH PHILOSOPHY

Research “is a process of intellectual discovery which has potential to transform our knowledge and understanding of the world around us” (Ryan *et al.* 2002:7). Ryan *et al.* (2002:11) report Plato’s definition of knowledge as “justified true belief”. Research in any discipline is based on certain fundamental epistemological, ontological and methodological assumptions about the nature of reality, the role of theory and the significance of empirical experimentation (Abubakar, Ahmad, Kaoje & Abdulazeez 2016:30). Therefore, in a process of understanding the world around us, we must consider the issue of the nature of the belief, the basis of the truth, and the way the truth is justified (Ryan *et al.* 2002:11). Prior to the 1990s, accounting research used two research paradigms, namely the quantitative approach and the qualitative approach, which are respectively grounded positive and interpretative paradigms (Ryan *et al*. 2002). A **positive** paradigm is coupled with the rational and objective measurements of observable phenomena while the **interpretative** paradigm is coupled with subjective phenomena, such as ideas, opinions and patterns (Saunders, Lewis, Thornhill & Wilson 2009). The fundamental ontological and epistemological assumptions about the two approaches as derived from the work of Chua (1986) are reported (Ryan *et al.* 2002:41-42) and summarised in

Table 5.1.

As indicated in

Table 5.1 regarding belief in knowledge positive accounting research assumes that theory and observation are independent of each other while under interpretive accounting research theory is used to provide explanation of human intentions. Regarding belief about physical and social reality, positive accounting research assumes that empirical reality is objective and external to the subject

while under interpretive accounting research reality is socially created and objectified through human interaction.

Table 5.1: Ontological assumptions about positive and interpretative accounting research

Belief	Positive accounting research	Interpretive accounting
Belief regarding knowledge	Theory and observation are independent of each other; quantitative data are used as a basis for generalisation	Theory is used to provide explanations of human intentions. Its adequacy is assessed by logical consistency, subjective interpretation, and agreement with actors' common-sense interpretations
Belief about physical and social reality	Empirical reality is objective and external to the subject (the researcher). Human actors are essentially passive objects who rationally pursue their assumed goals. Society and organisations are basically stable, and dysfunctional behaviour can be managed through the design of control systems	The reality is socially created and objectified through human interaction. Human action is intentional and has meaning grounded in a social and historical context. Social order is assumed, and conflict mediated through shared meanings
Relationship between accounting theory and social practice	Accounts are concerned with means, not ends; they are value-neutral, and existing institutional structures are taken for granted	Accounting theory seeks to explain action and to understand how social order is produced and reproduced

Source: Adapted from (Ryan *et al.* 2002:41-42)

The two research paradigms are actually grounded in theoretical and not practical considerations. Thus in order to gain advantages from the strength of each of the two approaches, a third research paradigm, which is a mix of positive and interpretive research, was proposed (Lund 2012:156). A mixed research method approach should be based on the substantive research question and not on the methodological and epistemological considerations (Kelle 2006; Lund 2012). Thus, the researcher is supposed to choose his or her methodological approach based on the type of research question in hand.

Mixed research method approach enables researchers to "combine the breadth and depth in empirical inquiries, to enhance the validity of research findings through triangulation and to facilitate the mobilisation of multiple theories in examining management accounting practices" (Modell 2010:1). The question of whether the mixed research method approach is a third paradigm or just a way to reap the strength of the two existing approaches in research is open to debate (Modell 2010:128). However, the mixed research method approach is considered an approach that has reduced the imperfections and raised the strength of the individual mono-methods by aiding reciprocal corroboration of the data and findings and construction of the lucid image of the investigated topic (Kelle 2006:309; Mangan, Lalwani & Gardner 2004). The advantages of the mixed research method approach have been discussed in the literature extensively and are summarised below (Lund 2012:157):

- In some cases, mixed research method approach is capable of answering more complex research questions than the individual mono-method approaches. While quantitative methods are suitable for testing hypotheses, qualitative methods are suitable for generalisation of hypotheses. The mixed research method approach supports solution for both explorative and confirmatory cases. Hence, the mixed research method can be used to generate and test theory in the same investigation.

- Quantitative and qualitative results may relate to different objects or phenomena but may be complementary to each other in a mixed research method approach. Hence, the combination of different perspectives provided by the qualitative and quantitative methods may produce a complete picture of the domain under study.
- Mixed research method approach may provide more valid inferences. If the results from very different strategies – such as qualitative and quantitative ones – converge, the validity of the corresponding inferences and conclusions will increase more than with convergence within each strategy.
- In mixed research method approach, the qualitative or quantitative results may be contradictory, which could lead to extra reflection, revised hypotheses and further research. Given that data have been collected and analysed correctly, such divergence could generate new theoretical insight.

Literature reports diverse applications of mixed research method approaches in social science research. For instance, mixed research method approach has been used in sociology (Brannen 2005; Kelle 2006), education (Lund 2012), logistic research (Mangan *et al.* 2004), organisational behaviour (Robert 2003), environmental management (Ashley & Boyd 2006) and ergonometric science (Ãsberg, Hummerdal & Dekker 2011). In accounting science research, mixed research method approach have widely been used (Brown & Brignall 2007; Davila & Oyon 2008; Modell 2005; Modell 2009).

5.3 RESEARCH APPROACH

The research applied a mixed research method approach within a pragmatic theory. According to the pragmatic theory, the researcher is encouraged to use both qualitative and quantitative approaches. This process is referred to as 'triangulation' (see Mertens & Hesse-Biber 2012). Although the qualitative and quantitative approaches are considered to be two distinct approaches, the

similarities between the two are remarkable, and the boundaries between them are dynamic (Onwuegbuzie & Leech 2005:376). The use of a mixed research method approach enables the researcher to gain access to the strengths and to suppress the weaknesses of the mono-method approach. The mixed research method approach makes it possible for the researcher to design research, which is robust enough to ensure the validity of the data and findings (Kelle 2006:308; Lund 2012:159). A mixed research methods approach designs research by focusing on the research problem and not on the fundamental assumption underlying the mono-method approach (Kelle 2006:307). Thus, the pragmatic approach is likely to give researchers flexibility in their research techniques.

Therefore, in order to gain a broad understanding of environmental reporting in the Tanzanian industrial sector, this research was designed to combine a number of methods as well as both quantitative and qualitative data analysis. By adopting a pragmatic approach, the researcher was able to gain a deep understanding of the issues affecting environmental reporting by the Tanzanian industrial sector.

Both quantitative and qualitative approaches were used to collect and analyse data in this research. The first step of the research was to construct a disclosure index (see section 5.4 for details). The disclosure index was prepared, and experts on environmental issues were required to give their opinion on whether the item should be reported or not, and the reasons for their decisions. In both rounds (i.e. round one and round two of the Delphi inquiry see section 5.5), the responses from the experts were qualitatively analysed. In round three of the Delphi inquiry, the experts were requested to rate the items in the disclosure index according to their importance, using a five-point Likert-type scale. Therefore, the responses from the experts were quantitatively analysed by finding the average score of each item in the disclosure index. The extent of environmental reporting in annual reports from industrial sector was analysed using content analysis (see section 5.7 for details). In analysing the environmental information reported in annual reports first, the information was coded based on the disclosure index that had been developed and thereafter

quantitatively analysed using a number of sentences reported and the average score of each item in the index. Finally, the case study for testing the framework was done qualitatively.

This research had mainly three objectives:

- to develop the disclosure index to measure the current nature and extent of environmental reporting by the industrial sector;
- to develop a framework to guide environmental reporting by the Tanzanian industrial sector; and
- to investigate the applicability of the framework that was developed for the Tanzanian industrial sector.

Figure 5.1 shows the schematic organisation of the items that will be discussed in the remainder of this chapter.

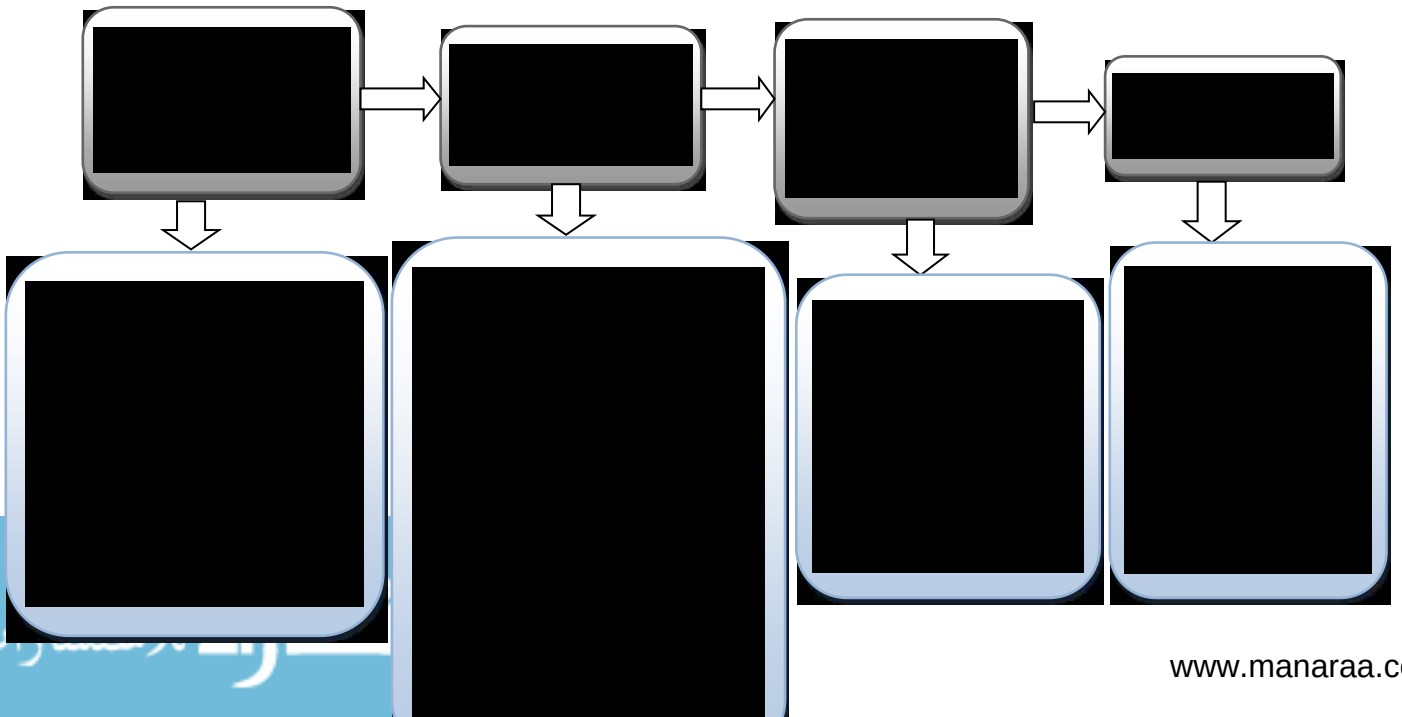


Figure 5.1: Schematic organisation of the methodology

Source: Author's compilation

5.4 DEVELOPMENT OF ENVIRONMENTAL DISCLOSURE INDEX

There were two phases in the process of developing the environmental disclosure index (EDI) for the Tanzanian industrial sector. The first phase involved identifying and refining the items for disclosure from the literature. Studies on environmental reporting or disclosure (Branco *et al.* 2008; Chatterjee & Mir 2008; Clarkson *et al.* 2008; De Villiers & Barnard 1999; Hackston & Milne 1996; Hooks, Tooley & Basnan 2012; Hooks & van Staden 2011; Pahuja 2009; Smith *et al.* 2007; Suttipun & Stanton 2012a; Tilt & Symes 1999; Wiseman 1982) and other international reporting frameworks (DEFRA 2013 ; GRI 2013a; Natural Heritage Trust 2000) were reviewed and the items to be included in the initial disclosure index were identified (See Appendix A). Specifically, the items to be included in the disclosure index were identified by reviewing the disclosure indices used in environmental reporting and disclosure studies. The items identified in the disclosure indices relating to the environment were selected for inclusion in the disclosure index, except when the item appeared to be similar to ones chosen previously. The identified items were grouped into three categories, namely 'Organisational context', 'Management performance policies and systems' and 'Environmental performance'. The grouping of the initial disclosure

index adopted categories specified in the framework for public environmental reporting because the items to be reported had been covered extensively and the reason for each category to be reported had been explained (Natural Heritage Trust 2000) (see section 5.7.3).

The second phase involved the development of the final disclosure index using the Delphi inquiry method. In the Delphi inquiry method, knowledgeable experts are consulted and asked for their opinion about certain issues at hand (Worrell *et al.* 2013:194). Therefore, in the process of constructing the disclosure index, experts were consulted and asked to give their opinion on which items should be reported by the industrial sector. In particular, the role of the experts was, first to confirm and validate items to be included in the EDI, and second, to assess the importance of the disclosure of each item by allocating weight to every item. In the process of rating the disclosure index, experts were requested to rate each item in terms of importance using a five-point Likert-type scale whereby 1 indicated the item is unimportant and 5 showed that the item was very important.

A five-point scale was selected to rate the items in the index due to the extent of its use in previous research (see Adhikari & Tondkar 1992; An, Harun, Hu & Liu 2014; Baker & Haslem 1973; Barrett 1977; Benjamin & Stanga 1977; Binh 2012; Buzby 1975; Firer & Meth 1986; Firth 1978; Hooks, Coy & Davey 2001; Hooks, Coy & Davey 2002; Hooks *et al.* 2012; Kribat 2015; McNally, Eng & Hasseldine 1982; Mirshekary & Saudagaran 2005; Rahman 2007; Schneider & Samkin 2008; Tong, Kidam & Wah 1990; Uddin, Ahmed & Bulbul 2016). Moreover, a five-point scale was chosen because it provides a sufficient range of responses that allow the scorer to distinguish between varying degrees of particulars in the disclosures (Hooks *et al.* 2001:50).

5.5 THE DELPHI INQUIRY

The Delphi inquiry (also known as Delphi method (see Okoli & Pawlowski 2004) or Delphi technique (see Rowe & Wright 1999) is a method that uses purposive sampling whereby a panel or a group of panels comprising knowledgeable

experts is used to establish their opinions or views on an issue (Worrell *et al.* 2013:194). Further, Linstone and Turoff (2002:3) define the Delphi technique as the "method for structuring a group communication process so that the process is effective in allowing a group of individuals as a whole to deal with a complex problem". The method provides a systematic and logical approach to soliciting, structuring and organising opinions and judgments on a particular topic from a panel of anonymous experts until an agreement is attained about the topic or until no further convergence is possible (Anderson, Rungtusanatham & Schroeder 1994:478). Therefore, the method is suited for theory-building research, exploratory research and multidisciplinary issues, particularly if analysis is recent or future trends are the focus of the research (Worrell *et al.* 2013:194).

The method provides anonymity to respondents, as all participants of the study remain unidentified to each other during the entire implementation of the study (Hsu & Sandford 2007:2). Anonymity among panellists is used as a way to remove the effect of personal influence and individual biases, which might hinder the ability of the panel to reach consensus (Worrell *et al.* 2013:194). Further, the authors argue that anonymity allows panellists to offer alternative opinion and expertise freely, and upon receiving the feedback from other experts, they may even change their opinion without any fear of losing status or credibility. Hsu and Sandford (2007:2) add that the use of electronic communication, such as email, as well as geographical dispersion of respondents increases confidentiality when using the Delphi technique.

Another noted characteristic of the Delphi technique is that of controlled feedback and iteration (Linstone & Turoff 2002:10). Controlled feedback involves the process of summarising and organising the feedback of previous rounds. An organised summary of prior iteration is distributed whereby each member gets an opportunity to provide additional insight to the topic (Hsu & Sandford 2007:2; Rowe & Wright 1999;354). In the Delphi method, the feedback from a previous round and the level of consensus reached among panel members is

communicated to each member. The feedback process allows and encourages the Delphi participants to reassess their initial judgment from previous iterations (Rowe & Wright 1999:354). The process continues until consensus is reached among the experts on a particular topic or when additional convergence is no longer possible (Worrell *et al.* 2013:194). The question of how many rounds will be sufficient to reach consensus depends on the nature of the problem at hand. The literature indicates that in most cases, three iterations are enough to collect the required information and to reach agreement or consensus (Custer, Scarcella & Stewart 1999). Hsu and Sandford (2007:2) add that the iterations can go up to four rounds if an additional round is important. They point out that round one of the Delphi inquiry normally starts with preparation of the open-ended questionnaire. According to Custer *et al.* (1999), the questionnaire is regarded as an important tool in this stage as it is used to solicit particular information about the topic from respondents. After collecting the replies from respondents, their responses are analysed and converted into a structured questionnaire. The structured questionnaire is then used as a tool to collect data in round two. In round two, respondents are supplied with the structured questionnaire and requested to review the summarised items based on the information provided in round one. Likewise, in this round, participants may be asked to rate-order items to set up priorities between items. In round two, areas of agreement and disagreement are pointed out. In round three, each Delphi respondent receives a questionnaire that includes summarised items and ratings from the previous round and is asked to provide an opinion on areas of difference, and to revise his or her judgment or give a reason for remaining outside the consensus. In the fourth round, the summary of round three results is prepared and supplied to members. This round provides a final chance to panellists to revise their decisions.

Generally, the intention of Delphi studies is to attain consensus between the participants; however, in some circumstances, participants fail to reach consensus. Thus, the question is when the Delphi process terminates. The

Delphi panel can be terminated because consensus has been reached, or because the number of rounds and continuance would result in panellist exhaustion, or because the consensus of the following iteration is statistically not significant (Worrell *et al.* 2013:201). However, it is recommended that the researcher take into consideration satisfaction measures to ensure that consensus among panel members are reached rather than that panellists suffer from fatigue (Rowe & Wright 1999:363).

Literature indicates that Delphi studies have used different methods to measure consensus. Von der Gracht (2012:1557) suggests that descriptive statistics, subjective analysis and inferential statistics can be used to define stopping criteria of the Delphi process. In particular, the researcher could use a stipulated number of rounds (Fan & Cheng 2006:218), a certain level of agreement (Alexandrov, Pullicino, Meslin & Norris 1996; Loughlin & Moore 1979:103; Putnam, Spiegel & Bruininks 1995; Seagle 2001:1; Stewart, O'halloran, Harrigan, Spencer, Barton & Singleton 1999), average percentage of majority opinion (Cottam, Roe & Challacombe 2004), mode, mean or median ratings and ranking, standard deviation (Chakravarti, Vasanta, Krishnan & Dubash 1998:159), interquartile range (Heiko & Darkow 2010), coefficient of variation (Zinn, Zalokowski & Hunter 2001) and post-group consensus (Rowe & Wright 1999:363).

Moreover, the selection of Delphi participants is also an important step in the Delphi process. The selection of participants to be included depends on the disciplinary area of expertise required by the issue at hand (Hsu & Sandford 2007:3). Literature indicates that there is no formula or commonly accepted criteria to guide the researcher in the process of selecting experts (Keeney, Hasson & McKenna 2006:208). However, the participants may be regarded as eligible to participate if they possess the required backgrounds and experiences related to the issue targeted. Ludwig (1997) adds that a Delphi study does not accept random selection of participants; instead, characteristics and qualifications of the desirable participants should be identified and a nomination

process used to select participants. So far, there is no guidance on the maximum and minimum number of experts to be included in a Delphi study. Worrell *et al.* (2013:199) note that most of the Delphi studies utilise between 10 and 30 expert participants. However, they argue that even a panel of four experts is appropriate if the panellists demonstrate a deep understanding of the subject matter. According to Ludwig (1997), the majority of Delphi studies have used between 15 and 20 respondents, while Okoli and Pawlowski (2004:18) suggest a panel size of 10 to 18 participants. Generally, the number of participants in a Delphi inquiry varies; however, if the sample is very small, participants may not be regarded as representative to discuss the issue at hand, and if it is too large, it might take too long due to a low response rate (Hsu & Sandford 2007:4).

The Delphi inquiry was used in this study because development of an EDI is complex and requires people who have knowledge, understanding and experience in environmental issues (Worrell *et al*. 2013:194). As discussed earlier (see section 5.5), this method was employed because it allowed anonymity of experts and did not require the individual experts to meet physically, which suited this study as most of the experts were dispersed around the country.

In this study, the experts were selected on the basis of access or availability depending on the knowledge and experience of the experts in environmental issues. The panel comprised experts from government, universities, the industrial sector and NGOs. In the process of identifying the experts to be included from government, government ministries dealing with environmental issues were identified. Only ministries with activities that had an obvious impact on the environment were selected. The information related to the activities of the ministries was obtained from their website. The ministries contacted were –

- the Ministry of Energy and Minerals;
- the Ministry of Industry, Trade and Investment;
- the Vice-President's Office; and
- the Ministry of Water.

Environmental regulatory agencies and government agencies or departments were also contacted through their websites and personal contacts. The following agencies were contacted:

- Tanzania Mineral Audit Agency (TMAA);
- Tanzania Bureau of Standards (TBS);
- National Environmental Management Council (NEMC);
- Tanzania Atomic Energy Commission;
- Tanzania Petroleum Development Corporation (TPDC);
- Controller and Auditor General (CAG); and
- State Mining Corporation (STAMICO).

The experts from the industrial sector were identified by using a list of registered companies from Business Registrations Licencing Agency (BRELA). The list obtained from BRELA was screened against the list from Confederation of Tanzania Industries (CTI) and TBS in order to identify the active companies. Generally, the companies were selected based on the environmental aspect of their activities. The industrial processes and the potential environmental impacts of each sector were explained in section 3.4 of this thesis. Industrial sectors considered for the Delphi inquiry were cement, steel, textile and mining. The selection of four industrial sector for the Delphi inquiry considered the representative of potentially highly polluting industries. Opinion from other industries was collected through members of Delphi inquiry from regulatory authorities such NEMC and government ministries as described in paragraphs eight and nine of this section.

The experts from universities were identified through the Tanzania Commission for Universities (TCU). TCU regulates higher education in Tanzania. The TCU provided a list of accredited higher education institutions and their specialisation. Therefore, only universities with environment and environment-related programmes were selected. The following universities were considered:

- University of Dar es Salaam;

- University of Dodoma;
- Ardhi University;
- Sokoine University of Agriculture; and
- Nelson Mandela African Institute of Science and Technology.

While NGOs are registered by the Ministry of Internal Affairs, an active list of NGOs was obtained from the Ministry of Energy and Minerals, because most of these NGOs dealing with the environment are in the mining sector and therefore work closely with the ministry responsible for minerals. In addition, a list of registered EIA and individual audit experts and firms on the NEMC database was also consulted. Priority was given to experts whose names appeared under both the respective organisations and the database of registered environmental experts of the NEMC.

Therefore, individuals who had knowledge and experience in environmental issues in the identified institutions were consulted by phone for their consent to participate in the Delphi process. A brief explanation about the Delphi process was provided to them. Those who agreed to participate were requested to provide their email addresses to be used in the Delphi process. The panel comprised 30 experts as depicted in Table 5.2.

Table 5.2: List of experts consulted during Delphi inquiry

Institution	Number of experts
Universities	7
Government ministries	4
Government agencies	10
Industrial sectors	8
NGOs	1
Total	30

Source: **Author's compilation**

In this study, three rounds were used to identify the point of consensus. As indicated in literature, in most cases, three rounds are sufficient to collect the

needed information and to reach consensus as adding more rounds can become boring for panellists, consequently reducing the validity of the findings (Fan & Cheng 2006).

The decision whether the item should be retained, added or deleted was based on majority opinion. After receiving the opinion from the experts, before deciding for items to be taken to the next round individual responses were shared to all the experts for them to comment by agree or disagree with other experts' opinion. Then the author analysed the opinion and decision was made based on the majority opinion. In case of equal number of opinions, the item was returned to the expert for further review and comments.

5.6 VALIDITY OF DISCLOSURE INDEX

The extent of environmental reporting (level of importance) was assessed using a self-constructed disclosure index. Despite its usefulness, the process of developing and applying the disclosure index is subjective; consequently, requiring thorough evidence for its validity. There are a number of tests available to assess disclosure index validity. According to the United States General Accounting Office (1989:22), validity refers to the ability of an instrument to measure what it intends to measure. It is argued that an adequate sample and reliability, although necessary are not sufficient conditions for validating inferences made via content analysis. Instead, researchers are requested to confirm the results of the content analysis with other results or measures that are recognised to be valid indicators of the phenomenon under the study (United States General Accounting Office 1989:22).

According to AbuRaya (2012:244), the validity of the disclosure index can be evaluated using content validity or construct validity. Content validity is defined as "the extent to which an instrument adequately samples the research domain of interest when attempting to measure phenomena" (Wynd, Schmidt & Schaefer 2003:509). Content validity can be measured by looking at how the researcher has reasonably identified and defined the content related to phenomena of

interest through an extensive review of literature and using a panel of experts (Polit & Beck 2006:493).

First, in the present study, to ensure content validity, the items included in the EDI were found by reviewing the relevant literature from previous research on environmental disclosure (Branco *et al.* 2008; Chatterjee & Mir 2008; Clarkson *et al.* 2008; De Villiers & Barnard 1999; Hackston & Milne 1996; Hooks *et al.* 2012; Hooks & van Staden 2011; Pahuja 2009; Smith *et al.* 2007; Suttipun & Stanton 2012a; Tilt & Symes 1999; Wiseman 1982). The items identified were clearly defined and classified into three categories, namely 'Organisational context', 'Management performance, policies and systems' and 'Environmental performance'. Second, the environmental experts from various institutions (academics, industries, government and NGOs) were given the disclosure index in order to validate the items and to rate them according to their importance, as it was assumed that the items were not all equally important. The validation and rating of the items in the disclosure index increased the content validity of the index.

Construct validity, on the other hand, focuses on how well the theory supports the research finding (AbuRaya 2012:245). Construct validity can be measured using the correlation coefficient (Sekaran 2003 as cited in AbuRaya 2012:245). The construct validity of the disclosure index can be performed using two tests, namely the correlation between the disclosure index and its elements, and correction between disclosure indices and the explanatory variable (AbuRaya 2012:245). However, in the present study, construct validity was not tested as the aim of the study was not to test the theory of disclosure but to acquire an overall understanding of disclosure practices in the country.

5.7 CONTENT ANALYSIS

The research technique used in this study to analyse the environmental information from annual and environmental reports was content analysis. Content analysis is defined as "a set of procedures for collecting and organising

information in a standardised format that allows analysts to make inferences about the characteristics and meaning of written and other recorded materials" (United States General Accounting Office 1989:6). This method is viewed as a systematic and objective analytic technique that is able to yield valid and replicable results (Krippendorff 1980:18). The technique has been widely used in environmental disclosure studies (see for example Aerts, Cormier & Magnan 2008; Branco *et al.* 2008; Deegan & Gordon 1996; Elijido-Ten 2004; Eljayash, James & Kong 2012; Hackston & Milne 1996; Hooks & van Staden 2011; Ienciu 2014; Kabir & Akinnusi 2012; Odera, Scott & Gow 2016; Sen *et al.* 2011; Uwuigbe & Jimoh 2012; Wiseman 1982).

Several steps have been recommended in literature to be followed when assessing the environmental reporting of the organisations via content analysis (see Krippendorff 1980; United States General Accounting Office 1989). However, Raman (2006:318) emphasises three steps: the selection of the disclosure media, the selection of the unit of analysis, and the identification of the disclosure theme, as explained below.

5.7.1 Disclosure media

The selection of appropriate documents for analysis is an important stage in content analysis (Krippendorff 1980). Various disclosure media have been used to examine organisational, social and environmental reporting either in isolation or in combination of various media, such as annual reports, websites, stand-alone reports, newsletters and other media. However, a commonly used document as data source in earlier corporate reporting studies has been the annual report (see for example AbuRaya 2012; Akbas & Canikli 2014; Albertini 2013; Ashcroft 2012; Branco *et al.* 2008; Burgwal & Vieira 2014; Chatterjee & Mir 2008; Cowan & Gadenne 2005; Deegan & Rankin 1996; Elijido-Ten 2004; Eljayash *et al.* 2012; Eltaib 2012; Guthrie *et al.* 2008; Hackston & Milne 1996; Hanafi 2006; Harte & Owen 1991; Hasseldine, Salama & Toms 2005; Ienciu 2014; Islam & Deegan 2008; Jariya 2015; Khlif, Guidara & Souissi 2015;

Monteiro & Aibar-Guzmán 2009; Murthy 2008; Odera *et al.* 2016; Raar 2007; Sen *et al.* 2011; Singhania & Gandhi 2015; Smith *et al.* 2007; Suttipun & Stanton 2012b; Tilling & Tilt 2010; Tilt 2001; Tilt & Symes 1999; Yusoff *et al.* 2006).

Several reasons have been given by different researchers for using annual reports over other means of disclosure. The annual report is a report incorporating both statutory and voluntary disclosures, which are regularly produced. It is further a mandatory document, which all organisations are required to prepare, and it can be accessed more easily than other media (Smith *et al.* 2007:189; Suttipun & Stanton 2012a:106; Tilt 2001:193). Tilt (2001:193) adds that, since an annual report is regularly produced, it enables the researcher to make comparison easily. Yusoff *et al.* (2006:10) emphasise that the information reported in an audited annual report tends to increase the user's confidence. It is further explained that an increase in the use of the annual report came about because of its acceptability to various user groups as it is taken as reliable media for environmental reporting (Akhtruddin 2005 as cited in Kabir & Akinnusi 2012 :163).

However, it has been argued that the corporate annual report as sole reporting media provides incomplete insights into corporate social disclosure (Guthrie *et al.* 2008:35; Unerman 2000:670) and alternative reporting media are recommended. Likewise, Roberts (1991:63) argues that focusing on the annual report only may limit the understanding of reporting practices. For instance, Unerman (2000:677) in his study found that annual reports contained less corporate social reporting than was contained in other corporate reports.

Presently, most organisations have started to use other media, such as websites and stand-alone reports to convey environmental information to their stakeholders. Sen *et al.* (2011:146) argue that, by producing a stand-alone report, organisations may signal that they consider CSR as important as financial reporting; hence, focusing on the annual report may lead to an incomplete or incorrect conclusion. Most importantly, it is suggested that when examining

environmental reporting practices, the focus should be on all disclosures since the studies in this area often subscribe to theories that recognise a wide range of stakeholder rights to acquire information (Hooks & van Staden 2011:203).

It has been argued that it is not possible to scrutinise all media used to report organisational, social and environmental reporting since the issue of consistency and completeness identification of these reports over a long period is expected to be challenging (Hammond & Miles 2004:65; Unerman 2000:670). Unerman (2000:671) emphasises that, although a number of disclosure media may be accessed, a limit should be put on the number of disclosure media to be examined in order to make sure that the data is complete and consistent. Unerman (2000:671) further argues that larger organisations may publish a large number of documents in a year that may leave the researcher overwhelmed.

In the present study, however, both annual reports and environmental reports of 2015 were used as sources of data. As argued by Roberts (1991:63), focusing only on annual reports limits an understanding of the practice of reporting. Among others, the purpose of the present study was to develop an ERF to guide organisations when preparing environmental reports. Before developing the framework, it was necessary to examine the extent of environmental reporting in Tanzania in order to understand the current reporting practice used by organisations operating in the country. Therefore, examining the extent of environmental information by only looking at annual reports could have limited the understanding of reporting practice in Tanzania, as annual reports are not all representative of environmental reporting practices.

5.7.2 Unit of analysis

After selecting the media to be used, the next step in content analysis is to select the appropriate unit of analysis. The choice of unit of analysis depends on how the researcher wants to analyse his or her data. However, the literature indicates that there is still a debate about which unit of analysis is appropriate to use (Gray, Kouhy & Lavers 1995a:83). According to the United States General Accounting

Office (1989 :10), the researcher using content analysis should designate the units of analysis called “recording unit” and “context unit”. The context unit set limits on the portion of written material to be examined for categories of words or statements. Recording units is a specific section of the context unit in the written material category, such as a word, sentences, a paragraph or entire document.

Various researchers have tried to discuss both the advantages and disadvantages of using one unit of analysis over another (see for example Akbas & Canikli 2014; Branco & Rodrigues 2007; Elijido-Ten 2004; Gray, Kouhy & Lavers 1995c; Guthrie *et al.* 2008; Hackston & Milne 1996; Hasseldine *et al.* 2005; Jupe 2007; Kabir & Akinnusi 2012; Tilt 2001; Unerman 2000). Experience from the prior studies indicated that various recording units were used by various researchers as follows;

- the number of words as recording units (see Akbas & Canikli 2014; Cowan & Gadenne 2005; Deegan & Gordon 1996; Deegan & Rankin 1996; Eljayash *et al.* 2012; Islam & Deegan 2008; Jariya 2015; Kabir & Akinnusi 2012);
- the number of sentences (see Chatterjee & Mir 2008; Elijido-Ten 2004; Eltaib 2012; Guthrie *et al.* 2008; Hasseldine *et al.* 2005; Hooks & van Staden 2011; Hughes *et al.* 2000; Mir, Chatterjee & Taplin 2015; Odera *et al.* 2016; Raar 2007; Tilt 2001; Uwuigbe & Jimoh 2012);
- the number or proportion of pages (see Gray *et al.* 1995b; Guthrie & Parker 1989; Hooks & van Staden 2011; Jupe 2007; Odera *et al.* 2016; Patten 1992; Unerman 2000); and
- percentage of total disclosure (see Trotman & Bradley 1981).

Several reasons have been given for using sentences as preferred recording unit over other units. For instance, Guthrie *et al.* (2008:39) in their study decided to use the sentence as recording unit arguing that a sentence is more suitable for providing meaningful inferences from narrative statements than a word. They further argued that charts, tables and photographs can be converted into equivalent lines (sentences) more easily than word count. Elijido-Ten (2004:14)

argues that a sentence is identified easily (sentences are natural units of narratives, which are clearly separated by punctuation marks) and allows the disclosure to be refined more and more. Hasseldine *et al.* (2005:236) add that a sentence is less subject to inter-judge variation than clauses, phrases or themes, while Hackston and Milne (1996:84) emphasise that problems related to how to account for the portion of pages or standardisation of the number of words can be overcome by using the sentence as a recording unit. They further argue that in coding processes, sentences are more reliable than any other unit of analysis. Mir *et al.* (2015:26) argue that other recording units, such as number of pages or paragraphs could include environmental information together with other information, while words are unable to convey meaning without context provided by sentences.

However, some authors have criticised the use of sentences giving several reasons. For instance, Branco and Rodrigues (2007:76) argue that measuring environmental reporting using sentences or lines has disadvantages of excluding measurements using photographs, charts or graphics, which might have been equally important as the narratives. Cowan and Gadenne (2005:173) point out that there are large differences in sentence length both between and within annual reports of organisations, and to avoid such difficulties, words were selected as the unit of measurement in their study. Likewise, Akbas and Canikli (2014:53) argue that the use of pages or sentences as recording units may pose a challenge when comparing the information reported due to different font sizes, pictures and page margins. In addition, Unerman (2000:675) points out that using the sentence as a unit of measurement ignores the possibility that two different writers could use a different number of sentences to convey the same message.

Moreover, there are a number of authors who have used words as a recording unit. Akbas and Canikli (2014:53) used the word as recording unit arguing that words can be categorised easily and little subjective judgment from the researcher is needed. Kabir and Akinnusi (2012:163) justify the use of the word as recording unit due to its acceptability by various authors. Gray *et al.*

(1995b:84) point out that words have the advantage of lending themselves to more exclusive analysis, and the pragmatic advantage that databases may be scanned for specified words. However, the use of the word has been criticised as decreasing the reliability and providing meaningless results or measures, particularly during the coding stage (Cowan 2007:175). Hackston and Milne (1996:84) argue that measuring corporate social disclosure using the number of words leaves researchers pondering which words are to be considered as corporate social disclosure and which not.

The use of paragraphs, pages or proportion of pages as recording unit overcomes the problem brought by the number of words or sentences. Jupe (2007:8) points out that using proportions of pages as a recording unit takes into account non-narrative reporting, for instance charts or photographs that would have been left out when counting sentences or words. However, the shortcoming arises when different font columns or page sizes or ambiguous pictures are used in the report (Elijido-Ten 2004:14).

The sentence was used as a unit of analysis in the present study in order to capture and categorise the environmental information in annual reports. In addition, the number of sentences reported in annual reports and environmental reports was used to measure the extent of environmental reporting for the industrial sector in Tanzania.

5.7.3 Identification of disclosure theme or categories

After selecting the unit of analysis, the following step in the content analysis is the identification of the disclosure theme or categories. According to Schreier (2012:87), the main categories are the aspects on which the researcher wants to focus, while sub-categories reflect what has been specifically said about the main categories. The United States General Accounting Office (1989:11) points out that formulating categories is the heart of content analysis and the categories formulated should meet the following standards, i.e. it should be exhaustive (be

able to capture all relevant information), mutually exclusive (no item can be placed in more than one category), and independent.

Previous studies have used different categories to examine social and environmental reporting in annual reports. For instance, Wiseman (1982) identifies four categories in her disclosure index: 'Economic factors', 'Litigation', 'Pollution abatement', and 'Other environmentally related information'. Hackston and Milne (1996), in their study of some determinants of social and environmental disclosure in New Zealand companies, divide the disclosure index into five categories, i.e. 'Environment', 'Energy', 'Products', 'Community', and 'General/other'. Pahuja (2009) used a disclosure index, which was divided into eight categories, i.e. 'Organisational overview', 'Prevention or repair of environmental damage', 'Aesthetic improvement', 'Pollution control measures', 'Conservation of natural resources', 'Environmental accounting', 'Project planning and management' and 'Social cost'.

The present study adopted the categories specified in a framework for public environmental reporting (Natural Heritage Trust 2000). According to this framework, the items to be reported is divided into five categories, namely 'Organisational context', 'Management performance policies and systems', 'Stakeholder involvement', 'Environmental performance' and 'Product or service performance'. However, in this study, only three categories were taken into consideration, namely 'Organisational context', 'Management policies and systems', and 'Environmental performance'. The three categories were selected because they provide sufficient information to understand the environmental performance of the organisation. These categories were further divided into a set of distinctive informational items.

The researcher adopted categories as specified in this framework because the items to be reported were extensively covered, and the reason for each category to be reported was explained. Further, the framework required the reporting to start from an 'Organisational context' category as this will enable the reader to

know the whereabouts of organisations, such as the name of the organisation, activities of the organisation, type of product produced, and the strategies of the organisation related to environmental protection. The 'Management performance, policies and systems' category tells how the organisation is performing in terms of compliance and adhering to internal policies and standards (Natural Heritage Trust 2000). It shows how various programmes and policies related to the environment protection are implemented. The 'Environmental performance' category provides the information on the impact by the organisation on living and non-living natural systems such as land, air, water and ecosystems. The category provides the information on the impact related to input (such as energy and water) and output (such as emissions, effluents and waste).

5.8 MEASUREMENT OF EXTENT OF ENVIRONMENTAL REPORTING

The literature indicates that the disclosure index is considered the best method to assess the extent of environmental reporting (Hossain 2002:2). Coy 1995 as cited in Hooks and van Staden (2011:202) defines disclosure index as "qualitative based instrument designed to measure series of the item which, when the score for the items are aggregated, gives a surrogate score indicative of the level of disclosure in the specific context for which was devised".

Beretta and Bozzolan (2008:6) point out that a disclosure index can be un-weighted or weighted. An un-weighted disclosure index assigns zero for an item not disclosed, and one for item disclosed, meaning that the disclosure can only measure the quantity of disclosure (AbuRaya 2012:239; Beretta and Bozzolan 2008:6). Weighted disclosure on the other hand involves assigning weight to the item as defined by a researcher (see for example Hooks & van Staden 2011; Pahuja 2009; Wiseman 1982). These researchers argue that weight reflects the importance assigned to various classes of users to each item disclosed.

Un-weighted disclosure indices have been criticised for presuming that all items in the index are important thus able to measure the quantity of disclosure. While

weighted disclosure indices have been blamed for being subjective during the process of scoring weight to disclosure items, it is argued that the use of weighted or un-weighted disclosure indices to examine the annual reports provides findings that have little or no difference (Firth,1980 as cited in Wei, Davey & Coy 2008:37). It is therefore suggested that both weighted and un-weighted disclosure can be implemented at the same time to see the effect of reporting.

In the present study, the extent of environmental reporting was measured by looking at both the quantity of disclosure and the level of the importance of the information reported. The quantity of the environmental disclosure was measured by counting the number of sentences reported in the annual report and in environmental reports. The sentences reported were read and categorised in an appropriate category as categorised in the disclosure index that was developed. Since the aim of measuring the quantity of disclosure was to know the space devoted to environmental reporting by the organisation, each sentence reported, and which was related to the environment was counted regardless of whether the sentence carried the information that had already been reported. Therefore, for each category, the total number of sentences was counted and added up to get the total environmental disclosure made by each organisation (see Table 7.4).

Moreover, the importance of the environmental information reported was measured using the weighted disclosure index that was developed. The items in the index were weighted by the experts according to their importance, using the five-point Likert-type scale. The weight of each item was obtained by summing the weight allocated to the item by the experts and dividing it by the total number of experts who weighted that item (See Appendix J). Again, to assign the weight to the environmental information reported, each sentence was read, and weight was assigned as indicated in the disclosure index that was developed (see Table 6.4). However, in this case, weight was assigned to the item only once regardless of the number of times it was mentioned. In addition, if the sentence reported

more than one item, each item was assigned weight as indicated in the disclosure index. The score for each organisation was obtained by adding the weight allocated to items in each category (see Table 7.5).

5.9 CODING OF ENVIRONMENTAL DISCLOSURE

In this study, coding referred to a process of extracting environmental information and assigning it to predefined categories in the disclosure index using the predetermined decision rule (United States General Accounting Office 1989). Decision rules facilitate the process of coding as they define which item of environmental information to record and under which category in the disclosure index. AbuRaya (2012:225) points out that sound established decision rules increase the objectivity and reliability of the instrument used and allow replication by other researchers. Therefore, to ensure effective coding, the disclosure media, disclosure index and decision rules are essential. As previously discussed (see section 5.7.1), the annual reports and environmental reports of 2015 were used to study the extent of environmental reporting, and the disclosure index that was developed was used for coding items from the reports and placing in the corresponding categories. The decision rules as used by AbuRaya (2012) in coding environmental disclosure were borrowed and modified to suit the present study (See Appendix B).

In the first step, every annual or environmental report was looked at before coding in order to grasp where the information related to the environment was located and to contextualise the possible category that fitted such information. The aim here was to get a primary understanding of the issues reported before the coding process started. In the process of recording, the emphasis was on the context and meaning to ensure that the information corresponded to environmental disclosure. Since the unit of analysis selected to codify the environmental information was a sentence, the information reported in the form of graph and picture was skipped as it was difficult to quantify such information using equivalent sentences.

In addition, in case a piece of information was presented in more than one sentence, the information was only recorded once; however, if the sentence carried a piece of information that could be categorised in more than one category then the information was recorded in each category. In order to ease the coding process, a coding sheet was prepared and used to record information from the annual report and environmental reports. Moreover, the coding framework as used by Schneider and Samkin (2008) was adapted and modified to suit the present study (See Appendix C). After the coding process had been completed, coded data was summed for each category of the disclosure and a total environmental disclosure score of the index was calculated.

5.10 RELIABILITY OF CODING PROCESS

In the present study, reliability was demonstrated in a number of ways, namely from the perspective of –

- the meaning of items to be included in the coding process;
- the development of a measuring instrument to spot and classify information in the annual report; and
- the way these instruments and meanings have been applied consistently and accurately.

According to Krippendorff (1980:130), reliability in content analysis can be classified in terms of, stability, reproducibility and accuracy. **Stability** refers to the ability of the same coder to produce the same result using the same data over time. **Reproducibility** refers to the ability of different coders to produce the same results using the same data, the same instrument and the same procedures. **Accuracy** refers to the ability of the coder to produce results similar to predetermined standards set (Krippendorff 1980:130-2). Milne and Adler (1999:238) add that reliability could be increased:

- by picking disclosure categories from well-grounded relevant literature;
- by using a reliable instrument; and

- by training coders and justifying that the coding decision has reached an acceptable level.

To ensure the reliability of the coding process, pretesting was done for a small sample of the annual report. The selected annual report was analysed to test and improve the coding instructions and categories. Specifically, the pretesting aimed to determine whether the categories had been clearly specified and whether the coding instructions were sufficient.

In order to ensure the reproducibility another researcher was engaged to perform an independent content analysis of the annual reports for the small sample (see for example Burgwal & Vieira 2014; Cowan & Gadenne 2005; Hooks & van Staden 2011). Generally, multiple coders are employed in order to reduce any uncertainty and overlapping of definitions and interpretations in the coding process. Therefore, differences arising during the coding process between two coders, i.e. the researcher and independent coder were found, compared and discussed to reach consensus (see AbuRaya 2012:236).

In addition, predetermined decisions rules were employed when coding the environmental information from the annual or environmental reports to the disclosure index. The decision rules used in this study have been adapted from AbuRaya (2012:459); however, some changes regarding the decision rules were carried out to include any relevant item, which suited the present study. It has been argued that well established decision rules and procedures enhance the objectivity and accuracy form of reliability, which in turn allows replication by other researchers (AbuRaya 2012:225).

5.11 THE SAMPLE

In order to determine the number of annual or environmental reports to be included in this study, various sources of information were considered. Initially, the list of all registered organisations in Tanzania was obtained from BRELA. It is required by law that all organisations operating in Tanzania must register with BRELA (see URT 2007c), however, BRELA cannot provide information in terms

of whether the organisation is operational or not. The list obtained from BRELA was screened to obtain operational organisations by comparing the list with the organisations registered in the CTI. The CTI was established to ensure that organisations operating in Tanzania are doing so in a favourable legal, financial and economic environment (see CTI 2018). CTI membership is voluntary thus some active or operational organisation might not appear in the CTI database. Consequently, other regulatory authorities, such as TBS, EWURA, SBT, TMAA, the Tanzania Food and Drugs Authority (TFDA) were consulted to confirm the operational status of the organisations. Likewise, the responsible government ministries, such as the Ministry of Health, Ministry of Industry and Trade, Ministry of Energy and Minerals, were also consulted to confirm the operational status of the organisations. Where the information was doubtful, a follow-up was made by telephone call to the regulatory authority or by a direct visit to the organisation to clear the doubt.

The organisations to be included in the study were selected from various sectors operating in Tanzania depending on the nature of their activities and potential impact to the environment. The population comprised the organisations from the following industrial sectors: mining, cement, pulp and paper, sugar, chemicals and chemical products, pharmaceuticals, food, beverages and water, leather, breweries, metal product, textile, electrical, plastic and rubber, lubricants, tobacco, water supply and sanitary services and health centres and hospitals. The organisations whose activities had low levels of environmental impact, such as banks were excluded from the study.

Therefore, in the process of selecting a sample to be included in the study, first, all industrial sectors considered to have a significant impact on the environment were identified (see Table 3.3). Second, in the case of the industrial sector with fewer than 50 organisations, the whole number was considered for the study. The reason for picking was based on the fact that since they were few, there might be some who may not respond to the request to participate in the study.

For sectors with more than 50 organisations, sampling was done purposively as follows. The water supply and sanitation services sector had 130 organisations representing cities, regional and district levels; however, it was the city-level organisations, which attended to the mass population. Thus, only five organisations from five cities of Tanzania related to this industrial sector were considered during the study. The health service industrial sector had 237 organisations operating in Tanzania. According to the Ministry of Health in Tanzania, the health services are classified as national, referral, regional and district hospitals. Since the national and referral hospitals are meant to support the regional and district hospitals, in this study only national (1) and referral (7) hospitals operating in Tanzania were considered.

For the food and beverage industry, there were 178 organisations operating in Tanzania at the time of this research, and 74 were based in Dar es Salaam. For ease of following up, only the 74 organisations, which were based in Dar es Salaam were considered in this study. Therefore, the total number of organisations contacted was 238 (see Table 7.1 for the number of organisations per industry) and the annual reports and environmental reports of 2015 were requested.

5.12 DEVELOPING THE ENVIRONMENTAL REPORTING FRAMEWORK

After development of the disclosure index and assessment of the extent of environmental reporting the next step was to develop the ERF. In the process of developing the framework, the EDI that was developed, international requirements, rules and regulations related to the environment from the NEMC, the IAS and IFRS, and other environmental reporting frameworks were considered. Specifically, the items that were suggested by the experts in the disclosure index were reviewed and incorporated into the framework, as it was assumed that those items were important and suited the Tanzanian setting. International requirements related to environmental protection that had been agreed by Tanzania, rules and regulations related to environment protection

issued by the NEMC, such as soil quality regulations, solid waste regulations and hazardous waste regulations were also reviewed and included in the framework.

The IAS and IFRS were also reviewed and considered when developing the framework. Tanzania started to use IFRS in 2005, and it is expected that the organisations prepare annual reports that abide by these standards. Usually, there is no international standard that deals exclusively with environmental impact in annual reports. However, various standards provide such information direct or indirectly.

In the same way, various ERFs, such as global reporting initiatives, guidelines by DEFRA and a framework for public environmental reporting in Australia were reviewed. The purpose of reviewing the frameworks was to establish the purpose, coverage and emphasis of each framework and if possible to borrow some ideas to fit the framework developed for this study.

5.13 CASE STUDY

After developing the ERF, two case studies were conducted to test the framework that was developed. A case study is a detailed investigation of phenomena within their context (Kothari 2004:113). Yin (1994:13) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident”. The objective of using a case study is to identify the factors that describe or explain the particular behaviour of a given unit. According to Kothari (2004:113), a unit can be an individual, a family, an organisation, a cultural group or a whole community. A case study investigates the unit in depth rather than in breadth (Kothari 2004:113). Case study research can be a single-case study or a multiple-case study (Yin 1994:2)

Several advantages have been mentioned for using case studies rather than another method. Since a case study involves thorough investigation, the behaviour of a particular unit can be fully understood by the researcher (Kothari 2004:115). The methods provide an opportunity for the researcher to use one or

more data collection methods (such as documentation, archival records, study reports, interviews, a questionnaire, direct observation) to explore individuals or organisations depending on the prevailing situation (Baxter & Jack 2008:545; Kothari 2004:115; Yin 1994:13). Case studies help researchers to develop hypotheses together with data that may be useful for testing them (Kothari 2004:115).

According to Ryan *et al.* (2002:142), case studies gained acceptance as a suitable research method in accounting research, and the authors argue that case studies could help us to learn the nature of accounting in practice, in terms of procedures, techniques, systems which are used and the way they are used. Accordingly, various types of case studies exist, namely descriptive case studies, illustrative case studies, experimental case studies, exploratory case studies and explanatory case studies.

According to Ryan *et al.* (2002:143-4), a **descriptive** case study aims to describe how accounting systems, procedures and technique are used in practice. It can be used to compare the similarities and differences of accounting practice using a number of organisations. Therefore, the objective of descriptive studies is to provide explanations on how accounting practices are done in the real world. **Illustrative** case studies try to demonstrate new and maybe innovative practices developed by certain organisations. The aim of these studies is to give an illustration of what had been attained in practice. **Experimental** case studies attempt to examine the complications involved in implementing newly developed accounting procedures and techniques, and to assess the benefit that can be achieved. **Exploratory** case studies are used to explore the reasons for particular accounting practices. These studies make it possible for the researcher to develop a hypothesis regarding the reasons for particular practices and possibly to make generalisations regarding accounting practices. **Explanatory** case studies, on the other hand, aim to explain the grounds for observed accounting practices. Generally, explanatory case studies use theories in place to provide explanations for particular practices and in case the theory

does not give such explanations, existing theories may be modified, or new ones developed to suit the case.

In the present study, the experimental case study was used to examine the feasibility and practicalities of implementing the ERF in a real-world setting. The case study provides an in-depth understanding of issues facing the industrial sector during the implementation of an ERF. In this research, a case study of two organisations (i.e. GGM and TBL Arusha branch) was considered. Two organisations were selected for testing the framework because it was assumed that the applicability of the framework might differ across the industries. It was thought that including two organisations could improve the validity of the framework.

5.14 ETHICAL CONSIDERATIONS

In the process of developing an ERF for the industrial sector in Tanzania, various stages were involved that required interaction with human participants. Specifically, the human participants were involved in the process of developing the EDI, in collecting annual reports to measure the extent of environmental reporting in Tanzania, and in testing the applicability of the framework that was developed. Therefore, in order to ensure the rights and confidentiality of the participants were protected, ethical approval was granted by the College of Accounting Sciences Research Ethics Review Committee of the University of South Africa (Unisa) before commencement of data collection (See Appendix D).

5.15 CHAPTER SUMMARY

This chapter communicated the methodology used by the present study in order to achieve the aims and objective of the study. The main objective of the study was to develop an ERF for the industrial sector in Tanzania. However, prior to the development of the framework, it was necessary to develop a disclosure index to be used in determining the extent of environmental reporting in Tanzania. The purpose of determining the extent of environmental reporting before developing the environmental reporting framework was to know what was

reported in Tanzania at that stage. The current reporting was compared to the reporting that was expected by stakeholders (i.e. Delphi experts involved in the development of the disclosure index). The differences observed were analysed and the probable reasons for the differences were discussed. Therefore, the observed differences and the probable reasons for reporting were taken into account when developing the framework.

In the process of developing the EDI, the Delphi inquiry method was used. Initial items to be included in the index were determined through a literature review. A purposively sampling technique was adopted when selecting the experts to be included in the study. Thirty experts were consulted for participation in the study. The role of the experts was first, to confirm and validate items to be included in the disclosure index, and second, to assess the importance of the disclosure of each item by allocating weight to every item.

Both annual reports and environmental reports of 2015 were used as sources of data. As it has been argued (see section 5.7.1), focusing only on the annual report limit an understanding of the practice of reporting. Therefore, examining the extent of environmental information by looking only to annual reports could have limited the understanding of reporting practice, as annual reports are not altogether representative of environmental reporting practices.

The sentence was used as unit of analysis to capture and categorise the environmental information in annual reports. Furthermore, the number of sentences reported in annual reports and environmental reports was used to measure the quantity of environmental reporting for the industrial sector in Tanzania. The importance of environmental information reported was measured using the weighted disclosure index that was developed. The items in the index were weighted by the experts according to their importance using a five-point Likert-type scale as adapted from Schneider and Samkin (2008).

In order to ensure the reproducibility, another researcher was engaged to perform a content analysis of annual reports for a small sample independently.

Differences were found in the coding process between two coders, i.e. the researcher and an independent coder, compared and discussed to reach consensus.

Furthermore, to ensure content validity first, the items included in the EDI were found by reviewing the relevant literature from previous research on environmental disclosure. Second, the environmental experts from various institutions (academics, industries, government, NGOs) were given the disclosure index in order to validate the items and rate them in terms of on their importance, as it was assumed that the items were not equally important. The validation and rating of the items in the disclosure index increased the content validity of the index.

Finally, the ERF was developed and tested. During the process of developing the framework, various issues were taken into consideration. For instance, the EDI that was developed, international requirements, rules and regulations related to the environment from the NEMC, IAS and IFRS, and other environmental reporting frameworks were considered. In testing the framework, experimental case studies were used to examine the feasibility, practicalities and current barriers to implementing the ERF in a real-world setting.

The next chapter present the results for EDI development for measuring the extent of environmental reporting in Tanzania.

CHAPTER 6

DEVELOPMENT OF THE ENVIRONMENTAL DISCLOSURE INDEX

6.1 INTRODUCTION

In order to determine the extent of environmental reporting in Tanzania, the environmental disclosure index (EDI) needed to be developed first. The EDI is an instrument designed to measure the extent of environmental reporting in annual and environmental reports. The disclosure index therefore may assist in predicting the level of environmental reporting reflected in annual reports or other reports prepared by organisations (Singhania & Gandhi 2015:192). Using the disclosure index, the rating of environmental reporting levels among organisations may be established.

As previously discussed (see section 1.3), one of the objectives of the present study was to develop an EDI that was used to determine the extent of environmental reporting in Tanzania. There were two phases in the process of developing the EDI. The first phase involved identifying and refining the items for disclosure from both the literature, i.e. previous researchers and other international reporting frameworks. The second phase involved the development of the final disclosure index using the opinion of a panel of experts through Delphi inquiry.

This chapter discusses and explains various issues, which arose during the process of developing the EDI. Specifically, it refers to the individual proposed items in the initial disclosure index and in the revised index together with agreement reached by experts. Further, the final disclosure index and the weight assigned by the experts are discussed. Lastly, the discussion is concluded by responding to part of the research question, which was “Which environmental information do stakeholders require?”.

6.2 SELECTION OF ITEMS INCLUDED IN THE DISLOSURE INDEX

There were two phases in the process of developing the environmental disclosure index (EDI) for the Tanzanian industrial sector. The first phase involved identifying and refining the items for disclosure from the literature. Studies on environmental reporting or disclosure (Branco *et al.* 2008; Chatterjee & Mir 2008; Clarkson *et al.* 2008; De Villiers & Barnard 1999; Hackston & Milne 1996; Hooks, Tooley & Basnan 2012; Hooks & van Staden 2011; Pahuja 2009; Smith *et al.* 2007; Suttipun & Stanton 2012a; Tilt & Symes 1999; Wiseman 1982) and other international reporting frameworks (DEFRA 2013 ; GRI 2013a; Natural Heritage Trust 2000) were reviewed and the items to be included in the initial disclosure index were identified (See Appendix A). Specifically, the items to be included in the disclosure index were identified by reviewing the disclosure indices used in environmental reporting and disclosure studies. The items identified in the disclosure indices relating to the environment were selected for inclusion in the disclosure index, except when the item appeared to be similar to ones chosen previously.

In the second phase using the Delphi method, the items identified in phase one were sent to environmental experts and asked to give their opinion on which items should be reported by the industrial sector. In particular the experts were requested to give their opinion on the items proposed, whether the item should be retained, removed or added (in case of new item) in the disclosure. The role of the experts was, first to confirm and validate items to be included in the EDI, and second, to assess the importance of the disclosure of each item by allocating weight to every item. In the process of rating the disclosure index, experts were requested to rate each item in terms of importance using a five-point Likert-type scale whereby 1 indicated the item is unimportant and 5 showed that the item was very important. The results of the Delphi inquiry are discussed in detail in section 6.3.

6.3 RESULTS FOR THE DELPHI INQUIRY

The Delphi inquiry was conducted in three rounds. In round one of the Delphi process, 30 experts were supplied with the initial disclosure index (See Appendix E) in order to solicit their opinion on which items to be included in the index. The EDI had three categories namely; 'Organisational context', 'Management performance, policies and systems' and 'Environmental performance'. The initial EDI consisted of 71 items, out of which eight items were from the 'Organisational context category, 21 items from 'Management performance, policies and systems' category, and 42 items from the 'Environmental performance' category. Specifically, the experts were requested to give their opinion on the relevance of the items proposed and whether the items had to be retained or not. They were further requested to add any item they thought was important to be reported, which was not captured in the initial index. The time given for this round was three weeks; however, the actual time taken was three months.

Results for round one of the Delphi inquiry indicated that 25 out of 30 experts returned the feedback. From the feedback, there were some suggestions on improvement in grammar in the items and definitions (See Appendix F), which were all taken into consideration. From round one, some experts suggested addition and/or deletion of the items from the initial disclosure index (see Table 6.1). One expert suggested the addition of a new item, namely 'Environmental disclosure information' to be among the items reported under the reporting category 'Management performance, policies and systems'. The expert argued that there should be a commitment from companies to disclose environmental information within and outside the organisation through appropriate media. Another expert suggested the addition of a new item, namely 'Costs of environmental incidents' under the reporting category of 'Management performance, policies and systems'. The experts also noted that the item, namely 'Cost related to the treatment of disposal of hazardous wastes' was similar to the item 'Environmental expenditure'; thus, it was suggested that the former should be deleted.

Seven new items were suggested to be added under the category 'Environmental performance' (see serial number 4 to 11, Table 6.1). Reporting on energy balance analysis, water balance analysis may be useful to the stakeholders to understand the level of efficiency of the energy and water systems of the organisation. Stakeholders may understand how the company is committed to sustainable use of water and conservation of the environment when the company discloses information on water abstraction, use and discharge permits, and the type of waste water treatment technology in place. Likewise, posting rehabilitation bonds in case of mining projects shows how organisations are committed to both government and other stakeholders to rehabilitating the land damaged during the mining process.

Table 6.1 Items suggested by experts for addition or omission in the disclosure index in round one

S/N	Disclosure item	Category	Comment
1	Environmental disclosure information	Management performance, policies and systems	This new item was suggested to be added
2	Costs for environmental incidents	Management performance, policies and systems (sub-category financial information)	This new item was suggested to be added
3	Cost related to treatment of disposal of hazardous wastes	Management performance, policies and systems (sub-category financial information)	The item should be omitted, it is a duplicate of 6.2.2.4.1 (i.e. 'Environmental expenditure)

S/N	Disclosure item	Category	Comment
4	System energy balance analysis	Environmental performance (sub-category energy consumption)	This new item was suggested to be added
5	Water abstraction, use and discharge permits	Environmental performance (sub-category water consumption)	This new item was suggested to be added
6	Water balance analysis	Environmental performance (sub-category water consumption)	This new item is suggested to be added
7	Waste water treatment technology in place	Environmental performance (sub-category water consumption	This new item was suggested to be added
8	Posting rehabilitation bonds (in case of mining projects) and rehabilitation plan	Environmental performance (sub-category land use and biodiversity	This new item was suggested to be added
9	Involvement of community in rehabilitation activities	Environmental performance (sub-category land use and biodiversity	This new item was suggested to be added
10	Internal waste handling procedures (collection, sorting and disposal)	Environmental performance (sub-category emission of effluent, waste and other emissions into the air)	This new item was suggested to be added
11	Energy produced from waste	Environmental performance (sub-category emission of effluent, waste and other emissions into the air)	Suggested to be omitted because it is a duplicate of 6.2.3.1.13 (i.e. utilising waste

S/N	Disclosure item	Category	Comment
			materials for energy production)

S/N= serial number

Source: Author's compilation of Delphi inquiry data round one

In round two, the information collected in round one was analysed, and a modified disclosure index was prepared. In this round, the responses from round one for the individual experts together with responses from other experts were collated (See Appendix G) and sent to the experts. Each expert was requested to provide his or her opinion on the differences that had been identified in round one, and to state whether they agreed or did not agree with the recommendations from other experts. In round two of the Delphi inquiry, 22 out of 25 experts responded to the inquiry. Therefore, the differences raised in round one were analysed and most of the items were agreed upon by the experts and it was considered that no more disagreement would occur. The time given for this round was two weeks, as it was in round one, but this round took three months. The results of round two were mainly based on the analysis of the issues or differences from round one. The decision whether the item should be retained, added or deleted was based on majority opinion. The decision for round two is presented in Table 6.2 and detailed work in Appendix H.

Table 6.2 Items suggested by experts for addition or omission in the disclosure index in round two

S/N	Item	Category	Comments from round 1	Comments from round 2
1	Environmental disclosure information	Management performance, policies and systems	This new item was suggested to be added	Item should not be added because the aim of this framework is to

S/N	Item	Category	Comments from round 1	Comments from round 2
				assist organisations in reporting environmental information
2	Costs for environmental incidents	Management performance, policies and systems (sub-category financial information)	This new item was suggested to be added	Agreed to be added as a new item, and the information should include actions taken and strategies to reduce the incidents from recurring
3	Cost related to treatment of disposal of hazardous waste	Management performance, policies and systems (sub-category financial information)	The item should be omitted, it is a duplicate of 6.2.2.4.1 ('Environmental expenditure')	Agreed for deletion
4	System energy balance analysis	Environmental performance (sub-category energy consumption)	This new item was suggested to be added	Agreed to be added
5	Water abstraction, use and discharge permits	Environmental performance (sub-category	This new item was suggested to be added	Agreed to be added

S/N	Item	Category	Comments from round 1	Comments from round 2
		water consumption)		
6	Water balance analysis	Environmental performance (sub-category water consumption)	This new item was suggested to be added	Agreed to be added
7	Waste water treatment technology in place	Environmental performance (sub-category water consumption)	This new item was suggested to be added	Agreed to be added but relocated to be under 'Management performance, policies and systems category'
8	Posting rehabilitation bonds in case of mining projects	Environmental performance (sub-category land use and biodiversity	This new item was suggested to be added	Agreed to be added but modified to read "posting rehabilitation bonds and rehabilitation plan"
9	Involvement of community in rehabilitation activities	Environmental performance (sub-category land use and biodiversity)	This new item was suggested to be added	Agreed to be added but combined with donations or grants and termed 'corporate social responsibility' (CSR)
10	Internal waste handling procedures	Environmental performance (sub-category	This new item is suggested to be added	Agreed to be added

S/N	Item	Category	Comments from round 1	Comments from round 2
	(collection, sorting and disposal)	emission of effluent, waste and other emissions into the air)		
11	Energy produced from waste	Environmental performance (sub-category emission of effluents, waste and other emissions into the air)	Suggested to be omitted because it is a duplicate of 6.2.3.1.13('Utilising waste materials for energy production)	Agreed for deletion

S/N= serial number

Source: Author's compilation of Delphi inquiry data round two

In round three, the final disclosure index was prepared and sent to the experts for the purpose of rating the items (See Appendix I). Again, the time given for this round was two weeks; however, the actual time taken was two months. In this round, experts were requested to weight each item in the disclosure index in terms of importance using a five-point Likert-type scale (1 to 5). A value of 1 was assigned to an item if it is unimportant, and 5, if it the item is very important. Thereafter, the disclosure index was refined to reflect the weight of each item. It was considered that a decision to rate the items was necessary because the items in the disclosure index were not equally important as different user groups might value each item differently. In round three, 22 out of 22 experts responded to the final EDI.

To summarise, a total of 30 experts agreed to participate in the Delphi process. In round one, 30 experts were supplied with the initial index out of which 25 responded. In round two, the disclosure index was supplied to 25 experts and 22 responded. In round three, the index list was circulated to 22 experts and they all responded in this final round. The results of the Delphi inquiry are discussed in detail in the subsequent subsections 6.3.1, 6.3.2 and 6.3.3.

6.3.1 Organisational context

The 'Organisational context' category provides information about general organisational activities and management. Information, such as organisational profile details, top management commitment in terms of environmental protection, environmental objectives and target will give the reader an understanding of the activities, services and operations of reporting organisations and how the organisation itself is committed to environmental protection issues.

Under the organisational context of the organisations, the following items, as derived from the literature, were proposed to be included in the initial disclosure index and provided to experts during the Delphi inquiry (See Appendix E):

1) organisational profile;
2) top management commitment to the environment;
3) descriptive overview of major environmental risks and impacts of the organisation;
4) establishment of environmental targets and objectives;
5) discussion of regulations and requirements;
6) environmental management policies and systems;
7) environmental budget; and
8) environmental management board and committees.

6.3.1.1 Organisational profile

The organisational profile informs the readers of the report about the type of activities done by the organisation and for how long the organisation has been operating. From the organisational profile, the reader can understand which activities have been covered and what have not been covered in the report. The organisational profile should include information such as name of the organisation, nature and type of the activities of the organisation, type of product, size of the organisation, nature of ownership and legal form (GRI 2013a, Natural Heritage Trust 2000).

In round one of the Delphi inquiry, the experts suggested the inclusion of relevant licences and permits under which the organisation operates, the date the organisation started its operations, and the mission and vision of the organisation. The experts suggested that by including licenses and permits and mission and visions of the organisation, the reader will be able to understand how the broader activities of the organisation conform not only to legal requirements but also to the goals of the organisation itself (See Appendix G).

Therefore, round two of the Delphi inquiry reached consensus that the organisational profile item should include name of the organisation, nature and type of the activities of the organisation, type of product, size of organisation, nature of ownership and legal form, relevant licences and permits, the date the organisation started its operations, and mission and vision of the organisation.

6.3.1.2 Top management commitment to environment

This refers to the statements by the CEO or chairperson of the board of directors or any senior member of the management team related to the annual reports about organisation obligations on environment-related issues (Natural Heritage Trust 2000). This is first impression from the management statement that will shape the reader's mind-set on how committed the organisation is to environmental issues.

During round one of the inquiry, the experts agreed about top management commitment to the environment being a reporting item (See Appendix G). The experts suggested the following:

1. The CEO should provide the framework for setting and reviewing environmental objectives and targets and communicate to all people working for or on behalf of the organisation
2. The CEO should define clearly environmental policy, commitment to continual improvement and prevention of pollution.
3. The organisation's commitment to comply with applicable legal requirements and with other requirements to which the organisation subscribes, which relate to the organisation's environmental aspects
4. In case CEO is for the group of companies then the senior member of the management team should be the managing director or general manager.
5. A statement by the Minister to be added for government institutions.

During round two of the Delphi inquiry, issues raised by experts in round one were analysed. The experts agreed that the organisations should disclose information related to top management commitment to the environment by providing the framework for setting and reviewing environmental objectives and targets and communicate it to all people working for or on behalf of the organisation. The experts agreed about the commitment by management about the environmental policy and commitment to continue improvement and prevention of pollution. Experts indicated that the reporting of environmental policy should be short and concise. How the organisation is committed to legal environmental requirements should remain within the environmental policy of the organisation.

Regarding who will be responsible to communicate to stakeholders about the commitment of top management to the environment in case the reporting organisation is a group of companies, consensus was reached that the

commitment should be by the head of the organisation and not the group CEO. One expert emphasised that one who communicates about the commitment of the organisation on environmental issues should be from the management team and not someone doing it on behalf of management. Some experts suggested that, in case of government ministries and institutions, the commitment should come from the minister responsible for the ministry or the institution.

Therefore, round two of the Delphi inquiry reached consensus that the 'Top management commitment to the environment' item should be a statement by the CEO or chairperson of the board of directors or any senior member of the management team of the organisation. In case of government organisations, the commitment statement should be issued by the minister responsible for the organisation. The statement should include information on environmental policy and commitment to continue improvement and prevention of pollution.

6.3.1.3 Descriptive overview of the major environmental risks and impacts of the organisation

This refers to the description of all potential dangers resulting from the activities of the organisation and their corresponding influence on the environment (GRI 2013a). Such description will convince readers and other stakeholders that the organisation is aware of the risks and impacts of its operations. Stakeholders who wish to invest in the organisation will do so while they are fully aware about the environmental effects of the activities of the organisation. Stakeholders of the organisation will be clearly informed about the environmental impacts of the organisation. The organisation, which is fully aware of its environmental risks and impacts, could easily analyse the risk, set mitigation measures and practise the mitigation plan depending on the impact level.

From round one of the Delphi inquiry, there were different ideas about the proposed reporting item (i.e. descriptive overview of the major environmental risks and impacts of the organisation). Out of the 25 experts, only one expert suggested complete disregard of the proposed item. The expert argued that no

organisation would be willing to disclose their activities, which pose negative impacts on the environment. Other issues raised by the experts were –

1. the item should provide the description of the production line processes;
2. consideration of the life cycle perspective as described by the new ISO 14001 of 2015 (see International Organisation for Standardisation [ISO] 2015); and
3. a statement of emergency Preparedness (See Appendix G).

From round two of the Delphi inquiry, the issues were analysed and agreed as described below.

The experts were of the opinion that the item 'Descriptive overview of the major environmental risks and impacts of the organisation' should not be ignored. The EMA of 2004 requires all organisations to identify and report the environmental risks, impacts and management plan for mitigating the risks (URT 2004). Risks are forward-looking; hence what is spoken, is 'what can go wrong' and the likelihood that it will go wrong. Organisations should therefore disclose their approaches to identify and mitigate their risks. Even if it is known that the organisations in Tanzania are currently not very willing to give out the information related to risks and mitigation measures, including the proposed reporting item will instil transparency culture among the reporting organisations. Furthermore, it is unlikely that the negative impacts of the organisation on the environment can be hidden. The negative impacts of the organisation or project are well known, depending on the nature of the organisation, products or projects especially, during the EIA process. The experts reached consensus that the item should be rephrased to 'Descriptive overview of the significant environmental risks and potential impact of the organisation.'

The experts suggested that the proposed reporting item should include sub-items such as:

1. description of the operations and processes of organisations;

2. what comes in and what goes out during each stage of production; and
3. clearly identify the characteristics and/or potential risks of waste generated at every stage.

One of the experts suggested that the organisation should describe only risky production lines or processes. It is however the opinion of the author that all processes should be described regardless of the risk level. This will provide information about how modern and environment-friendly the production process of the organisation is. The organisation should report issues related to the environment of the product, services and activities of the organisation that have a significant environmental impact and which can be controlled by the organisation. The experts suggested the emergency preparedness should be stated and included but under item 6.3.2.1.4, 'Environmental risk management strategies'. The experts suggested that there is no need of reporting about life cycle perspective as per ISO 14001 of 2015, since the standard is not mandatory and its scope is time-consuming. Consequently, most of the organisations may not adhere to the sub-item.

Consensus was therefore reached that the reporting item should be 'Descriptive overview of the significant environmental risks and potential impact of the organisation'. The item should include information related to the environment of the products, services and activities of the organisation that have a significant environmental impact and which could be controlled by organisation. A description of the operations and processes of the organisations, what comes in and what goes out of each stage of production, and clearly identified characteristics and potential risks of waste generated at every stage should be provided.

6.3.1.4 Establishment of environmental targets and objectives

This refers to the aims set by the organisation in order to manage the environmental risks and impact and list of measurable activities that would be performed in order to achieve the set aims (Government of Hong Kong [GovHK]

2015). During round one of the Delphi inquiry, the experts agreed about the item 'Establishment of environmental targets and objectives' with the following reservations (See Appendix G):

1. First, it was suggested that the item description should be "refers to the set organisational goals intended to be achieved in a specified timeframe in order to manage environmental risks associated with the activities performed by the organisation". In each goal, detailed activities are also depicted and they are the ones used to measure whether there is goal fulfilment or not.
2. It was also suggested that the set targets and objectives be compared with the national or international standards in case of no national standards.

During round two of the Delphi inquiry, the experts agreed that the description of the item proposed by the author had information similar to the first reservation, above. The experts suggested that the author's description of the item should remain. The experts suggested that the set targets and objectives be compared with the national or international standards in case of no national standards.

Consensus was reached that the reporting item should be 'Establishment of environmental targets and objectives'. The set targets and objectives should be compared with the national or international standards in case of no national standards.

6.3.1.5 Discussion of regulations and requirements

This refers to regulations from government that are related to the environment specific to the organisation and related requirements with which to comply. The discussion on environmental regulations would assist to inform stakeholders regarding the level of awareness of the organisation's environmental liabilities.

During round one of the Delphi inquiry, the experts agreed about the item 'Discussion of regulations and requirements'. The following issues were raised by some of the experts (See Appendix G):

1. It was suggested that the heading should refer to either environmental regulations and requirements or to policy, laws and regulations, or to environmental compliance obligations.
2. The discussion should cover environmental policy of 1997, EMA of 2004 and environmental regulations.
3. The organisation should list what the latest NEMC regulations require organisations to do, and then discuss only those items specific to the activities of the organisation.
4. The statement should be crafted to read "this refers to regulations from NEMC that are related to environment specific to the organisations and related requirements to comply with".
5. Regulations should cover both national and international requirement and include compliancy level in the explanation.
6. This item on the discussion of regulations and requirements should be included in section 6.3.2.2 that refers to compliance requirement.

During round two of the Delphi inquiry, the experts analysed the issues and came to the final agreement as described below.

The experts agreed that the item title should read 'Environmental compliance obligations'. It was further agreed that the item should not involve environmental policy and other policies. This is because the Acts and regulations are the products of policy. Therefore, the discussion should involve all regulations, which are related or specific to the activities of the organisations with reference to Acts from which the regulations are derived. The experts insisted that the discussion should not be restricted to the regulations set by the NEMC of Tanzania because the NEMC enforces only the EMA Act 2004 whereas there are other regulations

from various sector ministries, which address environmental issues. Normally, organisations indicate their awareness of all regulations related to their activities during the EIA process (URT 2004:64). The experts agreed that the discussion of the proposed items had to involve both national and international regulations in case of lack of local regulations. The discussion also had to establish the level of compliance of the regulations achieved by the organisation.

In conclusion, the reporting item was modified to read 'Environmental compliance obligations'. This refers to regulations (i.e. national or international in case of no national regulations) that are related to an environment specific to the organisations and related requirements with which to comply. The discussion had to establish the level of compliance of the regulations achieved by the organisation.

6.3.1.6 Environmental management policies and systems

This refers to a discussion of organisational environment policies, such as energy and water policy, and the arrangements or procedures available for environmental management (Natural Heritage Trust 2000).

During round one of the Delphi inquiry, the experts indicated that the item 'Environmental management policies and systems' had to be considered among the reporting items. Few concerns were raised as described below (also See Appendix G):

1 environmental policy should be separated from energy and water policies;

2 the title of an item should read 'Environmental policies and institutional framework' or 'Environmental management procedures';

3 the discussion should include the environmental policy and the health and safety policy of the organisation;

4 the discussion should emphasise relevant policy rather than simply referring to water and energy policies; and

5 organisational environmental policy to be included under section 6.3.1.2 (top management commitment to environment).

During round two of the inquiry, the experts suggested that environmental policy should not be separated from other policies. Environmental policy is cross-cutting, it caters for many sectors, such as energy, water and agriculture. The organisation should discuss the environmental policy specific to its organisational activities. The purpose of a policy is usually setting the scene for the EMS. From the policy, standards and procedures for various aspects such as water, waste and others are set in order to fulfil the commitment set in the policy. Regarding the changing of the title of the reporting item, the experts agreed that the proposed title was correct; hence, it had to remain. The experts agreed that the item should not be combined with item 6.3.1.2 (i.e. top management commitment to environment) because item 6.3.1.2 provides a statement, whereas in the current item (i.e. 6.3.1.6) a deep discussion of the policies is reported. The experts agreed that the item 6.3.1.6 should discuss both environmental and health and safety policies.

In conclusion, the experts reached consensus that the item should read 'Environmental management policies and systems'. The item should discuss environmental policy and health and safety policy, which are related to the activities of the organisation.

6.3.1.7 Environmental budget

'Environmental budget' refers to the budget set aside by the organisation to be used in implementing all activities related to the environment in the organisation. It can be a percentage of the total budget of the organisation or a budget set according to the line activity of the organisation. In this item, the organisation should indicate the percentage of the organisational budget that has been allocated to environment-related activities.

During round one of the Delphi inquiry, the experts agreed that the item about environmental budget should be included among the reporting items. The experts suggested the following (See Appendix G):

1. the item should be titled 'Budget for environmental management'; and
2. the item should be itemised i.e. it should indicate the breakdown of each item budgeted.

During round two, the experts agreed to change the item name and suggested that it should read 'Budget for environmental management'. Although one expert showed concern about setting the environmental budget as a percentage of the total budget, the experts reached consensus that the budget should be reported as a percentage of the total budget. The experts indicated that the budget should be reported in itemised form in accordance with environmental activities or objectives. Caution was raised that there must be guidance on what would constitute environmental expenditures.

Consensus was reached that the item should be named 'Budget for environmental management'. In this item, the organisation should indicate the itemised budget for each environmental management activity or objective expressed as a percentage of the total organisation budget. A total environmental management budget expressed as a percentage of the organisational budget should also be reported.

6.3.1.8 Environmental management board and committees

These are the board and committees formed by the accounting officer or CEO in order to oversee all matters related to the environment in the organisation. Members of the committee are expected to meet and deliberate on various issues, such as the environmental management plan, their implementation status, follow-up and sanctioning environmental defaulters within the organisations.

The item should indicate whether the organisation has an environmental management board and committees together with its composition of the board and the committees.

During round one of the Delphi inquiry, experts agreed that 'Environmental management board and committees' should be considered among the reporting items. The experts suggested the following (See Appendix G):

1. The item should be merged with item 6.3.1.2 (i.e. top management commitment to environment);
2. The roles of the board and committees should also be stated in the report, as well as an indication of the seniority of the chair of the committee and how this committee reports to the board; and
3. It was suggested that the emphasis should be on 'environmental structure' rather than on 'environmental board'.

During round two of the Delphi inquiry, the experts agreed that the item should not be merged with item 6.3.1.2 (top management commitment to environment). Merging the two items might make it difficult for the organisation to report all items under the same section. It was suggested that keeping the two items separately might make it easier for the readers to understand the item contents. The experts also agreed that the organisation should report on the seniority of the chair of the committee and how the committee reports to the board, as the higher the seniority of the chair of the committee, the higher the possibility of environmental management being implemented. One expert suggested that, instead of looking to the environmental management board and committee, there should be emphasis on environmental structure; however, most of the experts did not comment on this.

Therefore, consensus was reached that the item should read 'Environmental management board and committees'. During reporting, the seniority of the chair

of committee and the way the committee reports to the board should be elaborated.

6.3.2 Management performance, policies and systems

The intention with the 'Management performance, policies and systems' category is to provide the reader with information related to management effort and capability in managing issues that have influence in the environmental performance of the organisation. For instance, management may be interested in evaluating itself on how they have succeeded in implementing environmental policies and programmes throughout the organisation, or how effective the management system is in complying with requirements or expectations, and/or how management have succeeded in implementing their programme in local community related to environmental issues (Bureau of Indian Standard 2003).

Under the management performance, policies and systems the following items and sub-items have been proposed for environmental reporting (See Appendix G):

i. Management systems and programmes
    a. environmental management system available
    b. performance measured against internal policies and standards
    c. environmental audit programmes (including the results of environmental audit)
    d. environmental risk management strategies
    e. implementation of cleaner production techniques or technologies
    f. departments or offices for pollution control
    g. environmental training and awareness programmes
    h. complaint handling procedures
    i. supporting anti-litter campaigns

j. designing facilities harmonious with the environment

k. prevention and/or repair of damage to the environment

l. conservation of natural resources

ii. Compliance requirements

a. penalties for non-compliance

b. environmental liabilities under applicable laws and regulations

c. litigation about environmental issues

iii. External recognition and activities

a. environmental achievements and awards received

iv. Financial information

a. environmental expenditure

b. environmental fees

c. donations or grants

d. cost related to treatment and disposal of hazardous waste

e. environmental liabilities

6.3.2.1 Management systems and programmes

This sub-category specifically intends to provide information on the effort made by management in introducing environmental management systems and various programmes, which aim to protect the environment.

Environmental management system available

These are systems set by the organisations in order to address or manage environmental challenges facing the organisations (Natural Heritage Trust 2000). The system can either be tailored to suit particular organisations or they can make use of the system designed by known internationally accredited organisations such as the International Standardization Organization (ISO).

Therefore, this item refers to the adoption of environmental management systems, e.g. ISO 14001 or any system developed within organisations.

During round one of the Delphi inquiry, experts agreed that 'Environmental management system available' should be considered among the reporting items. One of the experts suggested that, if the organisation has no environmental management system (EMS) in place, they should adopt one from other sources. During round two of the Delphi inquiry, it was cautioned that the success of the EMS lies in the process of establishing EMS and not in the application. If organisations are encouraged to adopt an EMS, it may result in something not owned by management and everyone in the organisation. In this sense, adoption should be inclusive of the process of establishing the EMS.

Consensus was reached that 'Environmental management system available' should be considered among the reporting items. The item refers to the adoption of an EMS, e.g. ISO14001 or any system developed within organisations.

Performance measured against internal policies and standards

This refers to what has been achieved by the organisation measured against internal environmental policies and national and international standards.

In round one of the Delphi inquiry, the experts agreed that the item 'Performance measured against internal policies and standards' should be reported, with the following comments (See Appendix G):

1. One expert suggested the item to be separated into two parts, i.e. 'Performance measured against set standards and requirements' and 'Adherence to internal policies'.
2. The title of the item to read performance measured against internal procedures, legal requirements and standards that were developed.

In round two, the issue raised in round one was analysed. Regarding separating the item into two parts, most of the experts agreed with the suggestion, arguing that separation would make the reading logical. They also argued that breaking

the item into two parts would make the reporting organisation provide the information easily. However, one expert disagreed with such separation arguing that measuring an extent to which the organisation has managed to reach its environmental goals goes together with checking the quality of the performance measured against the stipulated benchmarks or criteria (such as internal environmental policies and national and international standards). Hence, the item was separated into two items as follows:

Performance measured against set standards and requirements

This measures the level of achievement of the organisation in implementing all environment-related activities. It shows the extent to which the organisation has managed to meet its goals.

Adherence to internal policies

This shows the extent to which the organisation has managed to implement its activities as per the set requirements in the internal policies of the organisation.

Regarding the change of title to be 'Performance measured against developed internal procedures, legal requirements and standards", experts disagreed with the modification.

Therefore, consensus was reached that this item would be separated into two parts 'Performance measured against set standards and requirements' and 'Adherence to internal policies'.

Environmental audit programmes (including the results of environmental audit)

The environmental audit programme indicates the plan according to which the environmental auditor is going to conduct his or her environmental audit. It includes the objective of the audit, activities to be performed, methods to be used during the audit, timelines for the audit, and the names of the auditors concerned. It is developed by the auditors themselves and it is specific for each audit. In this

item, the organisation should indicate the availability of environmental audit programmes and any results of the environmental audit.

During the Delphi inquiry, the experts agreed about the item but some of the experts suggested modification of the title to read 'Environmental monitoring and audit programme'. One expert did not agree with the modification arguing that environmental monitoring and environmental audit are two different issues. The majority of the experts however agreed with the modification of the title to include monitoring.

Consensus was reached that the item title should read 'Environmental monitoring and audit programmes'. The item refers to the availability of environmental monitoring and audit programmes and any results of environmental monitoring and audits.

Environmental risk management strategies

This refers to the strategies used to identify, assess and prioritise the environmental risks.

During round one of the Delphi inquiry, majority of the experts suggested the inclusion of 'Environmental risk management strategies' as a reporting item. The experts suggested:

1. the item should not overlap with item 6.3.1.3 (i.e. descriptive overview of the major environmental risks and impacts of the organisation);
2. the item should also cover risk assessment, i.e. risk assessment and risk management and environmental job safety analysis;
3. measures to be taken in case of any environmental risk.

One expert showed concern that many organisations may find it difficult to disclose their environmental risk management strategies.

During round two, the experts indicated that the environmental risk management strategies do not overlap with item 6.3.1.3 (i.e. descriptive overview of the major

environmental risks and impacts of the organisation) because in 6.3.1.3, only a general overview is disclosed whereas detailed information is provided under 'Environmental risk management strategies'. The experts agreed that the item should include risk assessment, i.e. risk assessment and risk management and environmental job safety analysis, and measures to be taken in case of any environmental risk and emergency preparedness. Regarding the difficulty of organisations to disclose their environmental risk and strategies, the experts considered it a challenge, and organisations should be encouraged to report on their environmental risk management strategies. It is the author opinion that many organisations find it difficult to do so because of a lack of prioritising environmental issues in their core business.

Consensus was reached that 'Environmental risk management strategies' should be considered among the reporting items. This refers to risk assessment, i.e. risk assessment and risk management and environmental job safety analysis and measures to be taken in case of any environmental risk and emergency preparedness.

Implementation of cleaner production techniques or technologies

This refers to the environmental management initiatives specifically geared towards implementing the activities of the organisation by using techniques, methods and inputs and/or materials that are not detrimental to the environment. This also may include the concept of sustainable production and consumption (Natural Heritage Trust 2000).

The experts agreed that the item 'Implementation of cleaner production techniques or technologies' should be retained. However, minor issues were raised. For instance, one expert suggested that the cleaner production should be promoted for government institutions. Further, another expert insisted that the item should be retained, especially when the control is set at each stage of the life cycle of the production. Regarding promoting cleaner production for

government institutions, the experts suggested that cleaner production should be promoted by all organisations not only government institutions.

Therefore, consensus was reached by the expert that the item 'Implementation of cleaner production techniques or technologies' should be reported and promoted by all organisations.

Departments or offices for pollution control

This refers to the presence of departments or offices that deal with pollution control (including the number of staffs with environmental responsibilities, qualifications and accountabilities, as well as their capabilities).

During round one of the Delphi inquiry, experts agreed with the item about departments or offices for pollution control. The experts suggested the following modifications (See Appendix G):

1. The item should read 'Department for environmental management or institutional arrangement for environmental management', while some suggested the use of 'Protection of the environment' rather than 'pollution control'. Another suggested the title to read 'Institutional arrangement for environmental management'.
2. In case the organisation has no specific department dealing with the environment, a discussion about which department handles environmental issues should be provided.
3. The item should include qualification or experience of staff involved.

During round two of the Delphi inquiry, it was agreed that the title should read 'Institutional arrangement for environmental management'. It was also analysed that it can be difficult for organisations to form a department for pollution control; it depends on the size of the organisation and the nature of the business. However, there must be qualified staff responsible for environmental management within the organisation or company. Therefore, if there is no specific department for environmental management, it should be stated from

which departments those who are involved in environmental management are selected, and what their qualifications and/or experience are.

Consensus was reached that the item should be worded 'Institutional arrangement for environmental management'. In case of no specific department or office dealing with environmental management, it should be stated to which office or department the members of staff dealing with environmental management are attached.

Environmental training and awareness programmes

This refers to the existing organisational environmental programmes, which show the environmental training needs, the target group, the type of course or training intervention per target group and timelines for the implementation of various training activities. It might cover the employee and other key stakeholders necessary for ensuring that the environment is protected.

The experts agreed on the inclusion of 'Environmental training and awareness programmes' as a reporting item. However, one expert suggested that reporting the percentage of employees trained may be misleading where the organisation has a considerable number of contract workers, such as in the mining industry. The expert suggested the item should report the number of employees trained in a year, which usually comprises both permanent and temporary workers. This suggestion was challenged by other experts arguing that if the organisation is implementing an EMS, it could be a requirement that contractors provide training to their staff; hence, reporting percentage of employees trained should not be a problem.

Consensus was reached that the item 'Environmental training and awareness programmes' to be considered among the reporting items**.**

Complaint handling procedures

This refers to the procedures set by the organisation on handling environmental complaint issues.

During round one of the Delphi inquiry, experts agreed on the inclusion of 'Complaint handling procedures' but with comments such as replace word 'complaint' with 'environmental grievance'. During round two of the Delphi inquiry, the experts agreed that the word 'complaint' should be replaced with 'environmental grievance' because 'complaint handling' had a narrow scope.

Thus, consensus was reached that 'Environmental grievance handling procedures' should be among the reporting items. This should refer to the procedures set by the organisation on handling environmental grievances.

Supporting anti-litter campaigns

This refers to the involvement of the organisation in supporting anti-litter campaigns in the community.

During round one of the Delphi inquiry, it was noted that the item 'Supporting anti-litter campaigns' was much focused and experts wanted it to capture more information.

Some suggested improving the title to read 'Supporting environmental protection and conservation campaigns' and organisations should report not only on litter but also on the general social responsibility (its general support to the surrounding community). Some experts suggested, 'Supporting anti-litter campaigns in the community' assumes that such campaigns are in existence; however, in many cases in Tanzania, these campaigns do not exist; hence, the item should be ignored.

During round two of the Delphi inquiry, it was agreed that the item should not be ignored because the reporting process will be continuous, so it should capture some future issues. Thus, the title for the item was improved to read 'Supporting environmental protection campaigns/activities'.

Thus, consensus was reached that the 'Supporting environmental protection campaigns /activities' should be considered among the reporting items.

Designing facilities harmonious with the environment

This refers to the selection, acquisition and/or design of facilities that are acceptable and environment-friendly.

The Delphi experts agreed that the item 'Designing facilities harmonious with the environment" to be among the reporting items. One expert suggested the item should be removed, but other experts did not agree with the idea and it was agreed to retain the item. On the other hand, one expert cautioned that the item may need to include green procurement policy first. However, the author's opinion is that the designing facilities harmonious with environment do not require green procurement policy.

Consensus was reached that the item namely 'Designing facilities harmonious with the environment' to be among the reporting items.

Prevention/repair of damage to the environment

This refers to the prevention and/or repair of damage resulting from processing or extraction of natural resources. Such prevention and/or repair efforts are activities such as land reclamation, deforestation and mining rehabilitation (URT 2004:71; URT 2010:44).

During round one of the Delphi inquiry, the experts agreed that 'Prevention/repair of damage to the environment' should be considered among the reporting items. One expert suggested that the item should read 'Environmental restoration programmes'. However, the suggestion was challenged during round two that changing the item to 'restoration' would only address one aspect of repair and leave aside an important part of prevention.

Hence, consensus was reached that the item should read 'Prevention/rehabilitation or restoration of damage to the environment'.

Conservation of natural resources

This refers to using natural resources efficiently, e.g. recycling and re-use of material.

During round one of the Delphi inquiry, one expert suggested merging the item with either section 6.3.2.1.5 (i.e. implementation of cleaner production techniques or technologies) or 6.3.2.1.10 (i.e. designing facilities harmonious with the environment). However, during round two of the Delphi inquiry, some experts suggested that the item should not be merged because the item encourages organisations to develop resource conservations habits.

Consensus was reached that “Conservation of natural resources” should be considered among the reporting items.

Environmental information disclosure

This item refers to the commitment of the organisation to disclose environmental information within and outside the organisation through appropriate media.

It was suggested that the item be added to reporting items during round one of the Delphi inquiry. It was the opinion of the expert that the commitment by the organisation to disclose environmental information within and outside the organisation signals the transparency and accountability of the organisation. During round two, some experts disagreed with the addition of this item, arguing that the disclosure index under preparation aimed to cater for this purpose. In other words, organisations that will be required to use the framework will automatically also be required to disclose environmental information publicly. Therefore, consensus was reached that the item should not be included in the disclosure index.

6.3.2.2 Compliance requirement

This sub-category mainly intended to provide information on how management is complying with various laws and regulations applicable to their organisations.

Penalties for non-compliance

This refers to any penalties, sanctions or fines for non-compliance with national, and local regulations or any applicable international declaration conventions and treaties associated with environmental regulatory requirements.

During round one of the Delphi inquiry, experts indicated that 'Penalties for non-compliance' should be among the reporting items. One expert suggested the 'polluter pays' principle (see Khan 2015) should be applied for non-compliance with environmental management. Experts agreed with the suggestion and said that the 'polluter pays' principle has already been incorporated in the current explanation of penalties for non-compliance.

Thus, the experts reached consensus that 'Penalties for non-compliance' should be among the reporting items. The time when penalties will be imposed, and actions taken to rectify the noncompliance should be stated.

Environmental liabilities under applicable laws and regulations

This refers to all liabilities required by laws and regulations, such as liabilities arising from contaminated land and water.

During round one of the Delphi inquiry, the experts unanimously approved 'Environmental liabilities under applicable laws and regulations' to be considered among reporting items.

Litigation about environmental issues

This refers to legal proceedings in terms of violating environmental laws.

During round one of the Delphi inquiry, one expert was of the opinion that the item was not necessary for reporting, whereas another expert suggested that the information is already contained in section 6.3.2.2.1 (i.e. penalties for non-compliance). The rest of the experts indicated that the item was important and should not be ignored during reporting. It was argued that section 6.3.2.2.1 requires organisations to report on penalties charged to organisations due to noncompliance, whereas in 6.3.2.2.3 (i.e. litigation about environmental issues), the legal proceedings about violating environmental laws (final penalties not yet implemented) are reported.

Therefore, consensus was reached that the 'Litigation about environmental issues' should be considered among the reporting items.

6.3.2.3 External recognition and activities

This category aims to provide information on the awards received by the organisation as well as achievements related to environmental protection.

Environmental achievements and awards received

This refers to any environmental achievements and awards received, e.g. award for environmental protection, award for energy conservation and award for control of greenhouse gas (GHG) emission (Natural Heritage Trust 2000:29).

During round one of the Delphi inquiry, experts agreed that 'Environmental achievements and awards received' should be considered among the reporting items. One expert suggested leaving out the 'awards' part as this may be subjective and not necessarily reflect the actual performance on the ground. The award also varies in nature and categories, e.g. one may have an award on, say energy conservation, but on the ground, they perform poorly on waste management. The awards tend to paint a good picture on the surface, which is not what one wants in this respect.

During round two, the suggestion to leave out the 'award' part was challenged by the experts, stating that awards are important as input to the 'carrots and stick' approach. One expert pointed out that the best approach to make organisations move towards compliance is recognition of positive steps they are taking. Furthermore, it is the opinion of this author that the challenge of reporting by surface painting a good image is not uncommon for voluntary reporting. Rigour of information reported under other items would be able to enlighten the reader whether the awards received informed a right image of the organisation or not.

Thus, consensus was reached by the experts that 'Environmental achievements and awards received' should be considered among the reporting items.

6.3.2.4 Financial information

This sub-category aims to provide information related to cost incurred or to be incurred by organisations in preventing or protecting the environment (Natural Heritage Trust 2000:30)

Environmental expenditure

This refers to any costs incurred in managing the environment, e.g. –

- cost of waste disposal or cost associated with cleaner production measures;
- purchase of pollution control equipment and facilities;
- operating cost for pollution control equipment and facilities; and
- costs incurred for training employees and the community about the environment.

The experts suggested that costs for the treatment and disposal of hazardous waste should be considered under this item.

The experts agreed that 'environmental expenditure' should be considered among the reporting items in the ERF. This refers to any costs incurred in managing the environment, such as –

- cost of waste disposal or cost associated with cleaner production measures;
- purchase of pollution control equipment and facilities;
- operating costs for pollution control equipment and facilities;
- costs incurred for training employees and the community about the environment; and
- costs incurred for the treatment and disposal of hazardous waste.

[redacted] *Environmental fees*

This refers to fees related to environmental licence fees, taxes or charges as condition for operations.

During round one of the Delphi inquiry, experts agreed that cost related to environmental fees should be among the reporting items of the ERF.

[redacted] *Environmental incidents and their cost*

This refers to cost incurred in relation to environmental incidents, such as oil spillages or waste water leakages.

The item was suggested by one of the experts in round one of the Delphi inquiry. In round two of the Delphi inquiry, some issues were raised regarding the addition of this item. One expert suggested that the item should not only consider the cost incurred but should also include measures taken to avoid recurring of the incident, for example investigating the cause of the incident. Another suggested the item to be merged with item 6.3.2.4.1, 'Environmental expenditure', arguing that the item involves expenditure on the environment. However, the suggestion to merge with item 6.3.2.4.1 (i.e. environmental expenditure) was challenged by one expert arguing that environmental incidents are sensitive issues, which should be reported separately from environmental expenditure. They agreed with the suggestion of including measures to be taken to avoid recurring of the incident.

Therefore, consensus was reached that the item 'Environmental incidents and their costs' should be considered among the reporting items and it should report the measure to be taken to avoid a recurrence of such incident.

[redacted] *Donations or grants*

This refers to any contribution made by organisations, e.g. donations to non-profit environmental activities, such as funding for academic research or community activities, such as tree planting (Natural Heritage Trust 2000:30)

During round one of the Delphi inquiry, experts agreed that cost related to donations or grants should be considered among the reporting items. Some experts suggested that the title should change to 'Corporate social responsibility', which would encompass cost to all types of supports provided to the community aimed at environmental management.

Thus, consensus was reached that the item title should be 'Corporate social responsibility' and the associated costs should be considered during environmental reporting.

Cost related to treatment and disposal of hazardous waste

This refers to the annual cost for treatment and disposal of hazardous waste.

In round one of the Delphi inquiry, the experts showed concern that this item might be repetitive. It provides the same information as item 6.3.2.4.1 (i.e. environmental expenditure). Therefore, it was agreed that the item should be deleted.

Environmental liabilities

This refers to the cost associated with all liabilities related to environmental remediation, e.g. liabilities associated with the sites, processes and products of an organisation (Natural Heritage Trust 2000:30).

During round one, the experts agreed about reporting costs related to environmental liabilities. However, some of the experts suggested that the item should be under section 6.3.2.2.2 (i.e. environmental liabilities under applicable laws and regulations). It was agreed that the two items are not merged because 6.3.2.2.2 discusses liability requirements whereas 6.3.2.4.6 (i.e. environmental liabilities) deals with financial implications of the liabilities discussed in section 6.3.2.2.2.

6.3.3 Environmental performance

Environmental performance (sometimes referred to as 'operational performance' (see Bureau of Indian Standard 2003) aims to provide information on the performance of operations of an organisation (Natural Heritage Trust 2000:31). The operations of the organisation include activities that aim to provide products or services to customers. The operations of organisations may be categorised based on the inputs to and output from its physical facilities and equipment (Bureau of Indian Standard 2003:24). Therefore, environmental performance may be reported by looking at the operations of the organisation and the environmental impact related to inputs (such as material, water and energy) and output (such as emissions into the air, waste and effluent). This may also include the impact of the organisation related to biodiversity and land use, products and service and transport (Natural Heritage Trust 2000:31).

Under the environmental performance category, the following items were analysed during the Delphi inquiry: 'Energy consumption', 'Water consumption', 'Land use and biodiversity' 'Materials and other resources used' and Emissions of effluent, waste and other emissions into the air', such as nitrogen oxides (NO_x) and carbon dioxide (CO_2) into the air.

6.3.3.1 Energy consumption

This item aimed to provide information to the reader on how organisations strive to balance the choice of energy that has a low impact on the environment. Energy use or consumption has implications through climate change, depletion of non-renewable resources and air pollution (Natural Heritage Trust 2000:31). Different sources of energy have diverse impacts on the environment, and it is therefore important to report the energy consumption by input type (Natural Heritage Trust 2000:31). For instance, the consumption of non-renewable fuel contributes more highly to GHG emission than renewable fuel. In addition, energy consumption has a direct effect on operational cost, which could lead to an increase in the fluctuation of energy supply and prices (GRI 2013a:89). Therefore, measuring

and monitoring energy use could assist an organisation to detect areas for improvement in achieving energy efficiency as well to demonstrate cost savings through implementation of an energy-saving programme.

In this item, the following sub-items were proposed to be included when reporting issues related to energy consumption:

1. Total energy consumed per year and per unit of output;
2. Total energy from renewable sources, such as water, wind, biomass and solar power;
3. Proportion of energy from –
    - heavy fuel oil;
    - diesel gas oil;
    - premium motor spirit (also known as petrol or gasoline);
    - illuminating kerosene or Jet A-1 fuel
    - coal;
    - wood; and
    - natural gas;
4. Proportion of equipment (including office equipment and lights) containing power-saving devices;
5. Disclosure of energy use at facility or by segment level;
6. Comparison of energy consumption for previous year or reduction target level;
7. Utilising waste materials for energy production;
8. Disclosing energy saving resulting from product recycling;
9. Disclosing increased energy efficiency of products; and
10. Research aimed at improving energy efficiency of product.

During round one of the Delphi inquiry, the following issues were raised by the experts (See Appendix G):

1. 'Energy consumption' to read 'Energy source, unit demand, and consumption'.
2. Suggested to combine the item 'Proportion of energy sourced from heavy fuel, proportion of energy sourced from coal, proportion of energy from

wood and proportion of energy sourced from natural gas' to read 'Use of energy from non-renewable energy sources'.

3. Regarding the items 'Proportion of equipment (including office equipment and lights) containing power-saving devices' and 'Disclosure of energy use by facility or by segment level', one expert cautioned that for this information to be reported, the item needs the energy audit to be carried out otherwise it will be difficult to report this item.

One expert suggested adding a new item called 'System energy balance analysis', which indicates what comes in, what is consumed and what is dissipated in terms of energy.

In round two, the experts analysed the issue raised in round one. Regarding the heading 'Energy consumption' to read 'Energy source, unit demand, and consumption', the experts disagreed with the proposed changes arguing that the original heading is more inclusive and covers all the issues mentioned. The proposal to combine the item 'Proportion of energy from heavy fuel, proportion of energy from coal, proportion of energy from wood and proportion of energy from natural gas' to read 'Use of energy from non-renewable energy sources' was also rejected by the experts. They argued that the aim of separating the items is to get to know how each type of non-renewable source contributes to pollution and climate change. For instance, an organisation using heavy oil as a source of energy will have a different impact on the environment compared to an organisation using gas. Thus, combining the items will not bring the intended information to the surface. In terms of the issue regarding the necessity for organisations to conduct an energy audit, the experts agreed to the proposal as this would enable the information for proposed items to be easily reported. Furthermore, the experts agreed to the suggestion of adding the item 'System energy balance analysis', and they argued that in case the energy audit is included, this item would be covered. Regarding other items proposed, the experts were in agreement that they should be reported in this category.

6.3.3.2 Water consumption

This item intended to provide information about the commitment of the organisation to the management of water within its activities. Normally, water and its use have an impact on the operations of the organisation. For instance, an organisation that requires a large quantity of water in its operations and which operates in an area where the water is scarce, could find itself at risk of not receiving enough water from supplies or an increase in the cost of water (GRI 2013a:97). Furthermore, there might be a possibility of conflict between the organisation and the surrounding local community due to competition for water, which might spoil the relationship between the organisation and its stakeholders(DEFRA 2013:44).

On the other hand, organisations using abstracted water could affect the environment by lowering the water table leading to a reduction in the volume of water available for use or creating a disturbance to the ecosystem (GRI 2013a:98). Good management of water could provide an opportunity to an organisation to demonstrate leadership, build a good relationship with the community, improve brand reputation and reduce costs (GRI 2013a:97). Therefore, it is important for the organisation to set water consumption strategies for the purpose of environmental management as well as cost savings.

In the water consumption category, the following sub-items were proposed to be included when reporting issues related to water consumption, namely:

1. Total water consumption per annum and per unit of output;
2. Water consumed for various uses, such as processing, cooling and sanitation;
3. Total water withdrawal by source;
4. Water sources significantly affected by withdrawal of water;
5. Total and percentage of water recycled and/or re-used; and
6. Total and percentage of water saved through efficiency measures.

During round one of the Delphi inquiry, the experts agreed on most of the proposed items. However, few issues were raised. One expert suggested the change to the item 'Water consumption' to read 'Water source, unit demand, and consumption'. Likewise, the sub-item 'Total water withdrawal by source' to be changed and to read 'Total water abstraction by source'. Furthermore, the items 'Water abstraction, use and discharge permits', 'Water balance analysis' and 'Waste water treatment technology in place' were suggested to be added.

In round two of the Delphi inquiry, the issues raised in round one was analysed. The experts agreed that the item 'Water consumption' should remain as suggested by the author. However, the proposed changes to the sub-item 'Total water withdrawal by source' to read 'Total water abstraction by source' were accepted by the experts. All new items, which were suggested during round one, were accepted by the experts during round two of the inquiry. However, in case of the item 'Waste water treatment technologies in place', it was suggested to be disclosed in section 6.3.2.1 (i.e. 'Management systems and programmes') as the item shows the effort put in by management to ensure waste water is properly treated.

6.3.3.3 Land use and biodiversity

Some operations of organisations require large premises to perform their activities. For instance, mining and cement organisations depend on land to operate as their raw materials are mined from the earth. The activities of the organisation may involve clearing of vegetation, cultivation of soil, release of chemicals to the land, and even subjecting the land to elevated temperatures and chemical conditions. Such activities may result in disturbing the ecosystem, soil pollution, pollution of water bodies, which affect both flora and fauna (see IFC 2007a; IFC 2007c). Therefore, this item aimed to provide information on how organisations are committed to management of land affected by their activities by identifying the impact on environmental systems. In case the land is disturbed, the extent and level of disturbance may be reported together with the

rehabilitation plan. Information related to habitats that are protected or which have been restored may be reported as this could enhance the reputation of reporting by the organisation and acceptance by the surrounding community.

In this item, the following sub-items were proposed to be included when reporting issues related to land use and biodiversity (also see Natural Heritage Trust 2000:33):

1. Area of land disturbed;
2. Area and percentage of land rehabilitated
3. Area of land used as buffer zones;
4. Area of land subjected to dryland salinity;
5. Area of land with significant erosion of topsoil;
6. Level of habitat impacts; and
7. Restoration as a result of the operations of the organisation."

During round one of the Delphi inquiry, one expert suggested that the sub-category should read 'Land use, biodiversity and sensitive areas'. Item 3.3.1 (i.e. area of land disturbed) to read 'Area of land disturbed and/or cleared'. Furthermore, another expert suggested the two sub-items 'Posting rehabilitation bonds' (in the case of mining projects) and 'Involvement of community in rehabilitation activity' to be added as reporting items (See Appendix G).

In round two of the Delphi inquiry, the experts disagreed with the proposal of changing the sub-category (i.e. land use and biodiversity), arguing that the item suggested by the author is informative. However, the experts agreed to add the newly proposed items (i.e. Posting rehabilitation bonds' (in the case of mining projects) and 'Involvement of community in rehabilitation activity). Regarding the item 'Posting rehabilitation bonds' (in the case of mining projects) one expert suggested not only posting rehabilitation bonds, but it is important for the organisation to have approved closure and rehabilitation plans, arguing that the

bond needs to be updated annually to cover the actual cost of environmental restoration. The item was consequently modified to read 'Posting rehabilitation bonds and rehabilitation plan'. Regarding 'Involvement of community in rehabilitation activity' one expert suggested the item to be reported under item 6.3.2.4.4 previously known as 'Donations or grants' but now changed to 'Corporate social responsibility'. The proposal to report the item 'Involvement of community in rehabilitation activity' under item 6.3.2.4.4 (i.e. Corporate social responsibility) was accepted.

6.3.3.4 Materials and other resources used

This item intends to provide information to a reader to understand how the organisation manages materials and other resources used during production or provision of services. However, there is a challenge that some organisations may have a concern regarding business privacy in reporting all resources used (Natural Heritage Trust 2000:34). Therefore, the organisation is expected to report only materials which are sensitive to the environment either due to their scarcity or their toxicity, hazardousness or because they have a significant potential environmental impact (Natural Heritage Trust 2000:34). For instance, an organisation dealing with mining activities may be obliged to disclose the type and quantity of chemicals used for mineral extraction and the management of such chemicals. This is because some of the chemicals, such as mercury, used in mineral isolation are hazardous not only to mine workers but also to the environment surrounding the mining sites. Therefore, this item aims to provide information on how organisations contribute to the conservation of the resources and increase its efficient use of materials and resources. Furthermore, the item provides information to those interested in the financial performance of organisations on how the cost of material is monitored as material consumption relates to the overall cost of production (GRI 2013a:86). Likewise, the information on the ability of an organisation to use recycled materials could be provided as using recycled materials, which could contribute to lowering the cost of operations as well as dependence on natural resources.

In this item, the following sub-items were proposed for inclusion when reporting issues related to materials and other resources used, namely:

1. Quantity of each type of renewable and non-renewable resources used per year and unit output;
2. Quantity of toxic or hazardous substances consumed per year and per unit output;
3. Percentage of inputs saved through efficiency measures; and
4. Sources of materials used and quantity per source.

During round one of the Delphi inquiry, the experts agreed to the proposed items to be included in the disclosure index. However, one expert suggested that the item 'Quantity of toxic or hazardous substances consumed per year and per unit output' should be extended to include type of toxic or hazardous substance and its disposal method. During round two of the Delphi inquiry, the experts agreed on the inclusion of the type of toxic or hazardous substance and its disposal method in the sub-item 'Quantity of toxic or hazardous substance consumed per year per unit output'.

6.3.3.5 Emission of effluent, waste and other emissions into the air

This item seeks to provide information to the reader on how an organisation manages issues related to emission of effluent, waste and other emissions into the air. The issues are supposed to be reported by the organisation as they pose a threat to human health and the natural environment. For instance, emissions into the air have an adverse effect on climate change, quality of the air humans breathe, and the ecosystem in general (GRI 2013a:107). Therefore, the sources and amount of emission into the air need to be identified and monitored. Likewise, waste water discharge, solid waste generation and disposal, hazardous waste generation, treatment and disposal, and the cost involved in waste disposal should be reported.

The following sub-items are proposed to be included when reporting issues related to emission of effluent, waste and other emissions into the air:

1. Total quantity of GHG emissions in terms of their carbon dioxide (CO_2) equivalent per year and by unit output;
2. Disclosure of GHG emission by source (e.g. coal, fuel or gas);
3. Disclosure of GHG emission by facility or by segment level;
4. Number of days the facility exceeds the emissions per year;
5. Comparison of GHG emission with the previous year;
6. Description of the methodology used to calculate GHG emissions;
7. Volume of waste water discharges per annum and per unit output;
8. Quantity of solid waste generated per annum and per unit output;
9. Quantity of solid waste generated per annum and per unit output;
10. Type and quantity of hazardous waste generated per year and per unit output;
11. Volume of hazardous waste stored on and off site;
12. Any waste prevention activities in place and their expected benefit; and
13. Energy produced from waste.

During round one of the Delphi inquiry, the experts approved the proposed sub-items to be included in the disclosure index with few observations. Concern was raised about the difficulties of reporting about greenhouse gases. One of the experts argued that organisations might lack technical experts to develop a report or they might be forced to outsource the service. Furthermore, it was stated that specific guidelines must be in place for efficient reporting about greenhouse gases. To demonstrate challenges associated with reporting on GHG emissions, one expert cited from her own experience that she searched emission factors for the carbon dioxide equivalent from power generation, transmission and a distribution company in Tanzania and failed to get the information.

One expert suggested a new sub-item, namely 'Internal solid waste handling procedures (collection, sorting and disposal)' to be included during environmental reporting. It was suggested that the sub-item 'Volume of hazardous waste stored on and off site' should be changed to include treatment cost and disposal costs. In addition, the item named 'Energy produced from waste' was suggested to be removed because was similar to item 6.3.3.1.13 ('Utilising waste materials for energy production').

The issues raised during round one of the Delphi inquiry were analysed in round two. Regarding the issues related to reporting about greenhouse gases, it was agreed that, despite the challenge pointed out, the item should remain. Since the technology level, environmental awareness and legal requirements are changing, the item should remain to serve future needs. The sub-item 'Internal waste handling procedures (collection, sorting and disposal)' was approved by the experts to be included during environmental reporting but had to be rephrased to 'Internal solid waste handling procedures (collection, sorting and disposal)'. The experts rejected the suggestion of including costs of treatment and disposal of hazardous wastes under the sub-item 'Volume of hazardous waste stored on and off site', because the suggested information had been included under item 6.3.2.4.1 (i.e. 'Environmental expenditure'). The experts also agreed to delete the item named 'Energy produced from waste' because it was a duplicate of item 6.3.3.1.13 ('Utilising waste materials for energy production').

In summary, during the Delphi inquiry, a total of 71 items were sent to experts for their opinion. During the Delphi process, two proposed items were deleted and nine new items were added. One item proposed was split into two items and ten proposed items were modified. Hence, the reporting index consists of 79 items as summarised in Table 6.3. The reporting index was considered during round three of the Delphi inquiry, where experts were asked to weigh the items based on their level of importance.

Table 6.3: Summary of un-weighted disclosure index after Delphi inquiry

S/N	Item
1	**Organisational context**
1.1	Organisational profile
1.2	Top management commitment to environment
1.3	Descriptive overview of the significant environmental risks and potential impact of the organisation
1.4	Establishment of environmental targets and objectives
1.5	Environmental compliance obligations
1.6	Environmental management policies and systems
1.7	Budget for environmental management
1.8	Environmental management board and committees
2	**Management performance, policies and systems**
2.1	**Management systems and programmes**
2.1.1	Environmental management system available
2.1.2	Performance measured against set standards and requirements
2.1.3	Adherence to internal policies
2.1.4	Environmental monitoring and audit programmes
2.1.5	Environmental risk management strategies
2.1.6	Implementation of cleaner production techniques or technologies
2.1.7	Waste water treatment technologies in place
2.1.8	Institutional arrangement for environmental management
2.1.9	Environmental training and awareness programmes
2.1.10	Environmental grievance handling procedures

S/N	Item
2.1.11	Supporting environmental protection campaigns and activities
2.1.12	Designing facilities harmonious with the environment
2.1.13	Prevention and rehabilitation or restoration of damage to the environment
2.1.14	Conservation of natural resources
2.2	**Compliance requirement**
2.2.1	Penalties for non-compliance
2.2.2	Environmental liabilities under applicable laws and regulations
2.2.3	Litigation about environmental issues
2.3	**External recognition and activities**
2.3.1	Environmental achievements and awards received
2.4	**Financial information**
2.4.1	Environmental expenditure
2.4.2	Cost-related environmental fees
2.4.3	Cost related to environmental incidents
2.4.4	Corporate social responsibility (CSR)
2.4.5	Environmental liabilities
3	**Environmental performance**
3.1	**Energy consumption**
3.1.1	Total energy consumed per year and per unit of output
3.1.2	Total energy used from renewable sources such as water, wind, biomass and solar power
3.1.3	Proportion of energy from heavy fuel oil
3.1.4	Proportion of energy from diesel gas oil

S/N	Item
3.1.5	Proportion of energy from premium motor spirit
3.1.6	Proportion of energy from illuminating kerosene or Jet A-1 fuel
3.1.7	Proportion of energy from coal
3.1.8	Proportion of energy from wood
3.1.9	Proportion of energy from natural gas
3.1.10	Proportion of equipment (including office equipment and lights) containing power and saving devices
3.1.11	Disclosure of energy use by facility or by segment level
3.1.12	Comparison to the previous year energy consumption or reduction target level
3.1.13	Utilising waste materials for energy production
3.1.14	Disclosing energy saving resulting from product recycling
3.1.15	Disclosing increased energy efficiency of products
3.1.16	Research aimed at improving energy efficiency of product
3.1.17	System energy balance analysis
3.2	**Water consumption**
3.2.1	Water abstraction use and discharge permits
3.2.2	Total water consumption per annum and per unit of output
3.2.3	Water consumed for various uses such as processing, cooling and sanitation
3.2.4	Total water abstraction by source
3.2.5	Water sources significantly affected by withdrawal of water
3.2.6	Total and percentage of water recycled and/or re-used
3.2.7	Total and percentage of water saved through efficiency measures
3.2.8	Water balance analysis

S/N	Item
3.3	**Land use and biodiversity**
3.3.1	Area of land disturbed
3.3.2	Area and percentage of land rehabilitated
3.3.3	Area of land used as buffer zones
3.3.4	Area of land subjected to dryland salinity
3.3.5	Area of land with significant erosion of topsoil
3.3.6	Level of habitat impacts and restoration as a result of operations of the organisation
3.3.7	Posting rehabilitation bonds (in case of mining projects) and rehabilitation plan
3.4	**Materials and other resources used**
3.4.1	Quantity of each type of renewable and non-renewable resources used per year and per unit output
3.4.2	Quantity of toxic or hazardous substances consumed per year and per unit output
3.4.3	Percentage of inputs saved through efficiency measures
3.4.4	Sources of materials used and quantity per source
3.5	**Emission of effluent, waste and other emissions into the air**
3.5.1	Total quantity of greenhouse gas (GHG) emissions in terms of their carbon dioxide (CO_2) equivalent per year and by unit output
3.5.2	Disclosure of GHG emission by source (e.g. coal, fuel and gas)
3.5.3	Disclosure of GHG emission by facility or by segment level
3.5.4	Number of days the facility exceeds the emissions per year
3.5.5	Comparison of GHG emission with the previous year
3.5.6	Description of the methodology used to calculate GHG emissions

S/N	Item
3.5.7	Volume of waste water discharges per annum and per unit output
3.5.8	Quantity of solid waste generated per annum and per unit output
3.5.9	Type and quantity of hazardous waste generated per year and per unit output
3.5.10	Volume of hazardous waste stored on and off site
3.5.11	Internal solid waste handling procedures (collection, sorting and disposal)
3.5.12	Any waste prevention activities in place and their expected benefit

Note: S/N = Serial number

Source: Author's compilation from Delphi inquiry data

6.4 FINAL WEIGTHING OF THE DISCLOSURE ITEMS

The third disclosure index was prepared by considering the agreements and consensus reached by the experts in round two. The index (See Appendix I) was therefore sent to experts in round three in order to rate the importance of the disclosure items. It was considered that the decision to rate the items was necessary because the items in the disclosure index were not equally important and different user groups might value each item differently. Therefore, in this round, the experts were requested to weight each item in the disclosure index in terms of importance using a 5-point Likert-type scale:

1- the item is unimportant
2- the item is of minor importance
3- the item is of intermediate importance
4- the item is important
5- the item is very important.

The final weight (mean score) for a specific disclosure item was obtained by adding the weight allocated to the item by an individual expert and then dividing by the total number of experts who responded to the item. A table showing the weightings given by the experts is presented in Appendix J. From Appendix J, it

is clear that the weighted disclosure index was constructed as presented in Table 6.4.

Table 6.4: Weighted disclosure index

S/N	Disclosure item	Weighting (mean)	Importance
1	**Organisational context**		
1.1	Organisational profile	4	Important
1.2	Top management commitment to environment	4	Important
1.3	Descriptive overview of the significant environmental risks and potential impact of the organisation	4	Important
1.4	Establishment of environmental targets and objectives	4	Important
1.5	Environmental compliance obligations	4	Important
1.6	Environmental management policies and systems	4	Important
1.7	Budget for environmental management	4	Important
1.8	Environmental management board and committees	4	Important
2	**Management performance, policies and systems**		
2.1	**Management systems and programmes**		
2.1.1	Environmental management system available	4	Important
2.1.2	Performance measured against set standards and requirements	4	Important
2.1.3	Adherence to internal policies	4	Important

S/N	Disclosure item	Weighting (mean)	Importance
2.1.4	Environmental monitoring and audit programmes	4	Important
2.1.5	Environmental risk management strategies	4	Important
2.1.6	Implementation of cleaner production techniques or technologies	4	Important
2.1.7	Waste water treatment technologies in place	4	Important
2.1.8	Institutional arrangement for environmental management	4	Important
2.1.9	Environmental training and awareness programmes	4	Important
2.1.10	Environmental grievance handling procedures	4	Important
2.1.11	Supporting environmental protection campaigns and activities	4	Important
2.1.12	Designing facilities harmonious with the environment	3	Intermediate importance
2.1.13	Prevention and rehabilitation or restoration of damage to the environment	4	Important
2.1.14	Conservation of natural resources	4	Important
2.2	**Compliance requirement**		
2.2.1	Penalties for non-compliance	4	Important
2.2.2	Environmental liabilities under applicable laws and regulations	4	Important
2.2.3	Litigation about environmental issues	4	Important
2.3	**External recognition and activities**		

S/N	Disclosure item	Weighting (mean)	Importance
2.3.1	Environmental achievements and awards received	2	Minor importance
2.4.	**Financial information**		
2.4.1	Environmental expenditure	4	Important
2.4.2	Cost-related environmental fees	3	Intermediate importance
2.4.3	Cost related to environmental incidents	4	Important
2.4.4	Corporate social responsibility (CSR)	3	Intermediate importance
2.4.5	Environmental liabilities	4	Important
3	**Environmental performance**		
3.1	**Energy consumption**		
3.1.1	Total energy consumed per year and per unit of output	4	Important
3.1.2	Total energy used from renewable sources such as water, wind, biomass and solar power	4	Important
3.1.3	Proportion of energy from heavy fuel oil	4	Important
3.1.4	Proportion of energy from diesel gas oil	3	Intermediate importance
3.1.5	Proportion of energy from premium motor spirit	3	Intermediate importance
3.1.6	Proportion of energy from illuminating kerosene or Jet A-1 fuel	3	Intermediate importance
3.1.7	Proportion of energy from coal	4	Important

S/N	Disclosure item	Weighting (mean)	Importance
3.1.8	Proportion of energy from wood	3	Intermediate importance
3.1.9	Proportion of energy from natural gas	4	Important
3.1.10	Proportion of equipment (including office equipment and lights) containing power and saving devices	3	Intermediate importance
3.1.11	Disclosure of energy use by facility or by segment level	3	Intermediate importance
3.1.12	Comparison to the previous year of energy consumption or reduction target level	4	Important
3.1.13	Utilising waste materials for energy production	4	Important
3.1.14	Disclosing energy saving resulting from product recycling	4	Important
3.1.15	Disclosing increased energy efficiency of products	4	Important
3.1.16	Research aimed at improving energy efficiency of product	4	Important
3.1.17	System energy balance analysis	4	Important
3.2	**Water consumption**		
3.2.1	Water abstraction use and discharge permits	4	Important
3.2.2	Total water consumption per annum and per unit of output	4	Important
3.2.3	Water consumed for various uses, such as processing, cooling and sanitation	4	Important
3.2.4	Total water abstraction by source	4	Important

S/N	Disclosure item	Weighting (mean)	Importance
3.2.5	Water sources significantly affected by withdrawal of water	4	Important
3.2.6	Total and percentage of water recycled and/or re-used	4	Important
3.2.7	Total and percentage of water saved through efficiency measures	4	Important
3.2.8	Water balance analysis	3	Important
3.3	**Land use and biodiversity**		
3.3.1	Area of land disturbed	4	Important
3.3.2	Area and percentage of land rehabilitated	4	Important
3.3.3	Area of land used as buffer zones	3	Intermediate importance
3.3.4	Area of land subjected to dryland salinity	3	Intermediate importance
3.3.5	Area of land with significant erosion of topsoil	3	Intermediate importance
3.3.6	Level of habitat impacts and restoration as a result of operation of the organisation	4	Important
3.3.7	Posting rehabilitation bonds (in case of mining projects) and rehabilitation plan	4	Important
3.4	**Materials and other resources used**		
3.4.1	Quantity of each type of renewable and non-renewable resources used per year and per unit output	3	Intermediate importance

S/N	Disclosure item	Weighting (mean)	Importance
3.4.2	Quantity of toxic or hazardous substances consumed per year and per unit output	4	Important
3.4.3	Percentage of inputs saved through efficiency measures	4	Important
3.4.4	Sources of materials used and quantity per source	3	Intermediate importance
3.5	**Emission of effluent, waste and other emissions into the air**		
3.5.1	Total quantity of greenhouse gas (GHG) emissions in terms of their carbon dioxide (CO_2) equivalent per year and by unit output	4	Important
3.5.2	Disclosure of GHG emission by source (e.g. coal, fuel and gas)	3	Intermediate importance
3.5.3	Disclosure of GHG emission by facility or by segment level	3	Intermediate importance
3.5.4	Number of days the facility exceeds the emissions per year	4	Important
3.5.5	Comparison of GHG emission with the previous year	4	Important
3.5.6	Description of the methodology used to calculate GHG emissions	4	Important
3.5.7	Volume of waste water discharges per annum and per unit output	4	Important
3.5.8	Quantity of solid waste generated per annum and per unit output	4	Important

S/N	Disclosure item	Weighting (mean)	Importance
3.5.9	Type and quantity of hazardous waste generated per year and per unit output	4	Important
3.5.10	Volume of hazardous waste stored on and off site	4	Important
3.5.11	Internal solid waste handling procedures (collection, sorting and disposal)	4	Important
3.5.12	Any waste prevention activities in place and their expected benefit	4	Important

Note: S/N = Serial number

Source: Author's compilation Delphi inquiry data round three

The results for the final disclosure index indicated that, overall

- 61 of the 79 disclosure items were considered to be important;
- 17 items were considered to be of intermediate importance; and
- 1 item is considered to be of minor importance.

No item was considered by the experts to be very important for disclosure in annual and environmental reports of the industrial sector. Also, none of the item was considered to be unimportant. The discussion for each category of the disclosure index is presented below.

The first category of the reporting items is 'Organisational context'. This category had eight items and they were all rated 4, which implied that the items were important. The second category of the reporting items was the 'Management performance, policies and systems'. This category has sub-categories, such as 'Management system programmes', 'Compliance requirements', 'External recognition and activities' and 'Financial information'. From Table 6.4, it can be observed that one out of 14 items under the sub-category 'Management system programmes' was rated as of intermediate importance, while 13 items were rated as important.

The sub-category of 'Compliance requirements' had three items, and all were rated important for reporting (see Table 6.4). The external recognition and activities sub-category had only one item, which was rated as of minor importance. This may imply that it is not essential to report items related to environmental achievement and awards. The results are in line with the argument by one expert who said that an organisation might have for example an award on energy conservation, but still is performing poorly on waste management. Therefore, an award tends to paint an image on the surface while deep down it is not what the image presents. The financial information sub-category had five items. The items cost-related to

environmental fees, and CSR was rated as of intermediate importance whereas environmental expenditure, cost related to environmental incidents and environmental liabilities were rated as important items.

Lastly was the 'Environmental performance' category. This category had five sub-categories as indicated in Table 6.4. The first sub-category was the 'Energy consumption' with 17 items, and 11 of 17 items were rated as important for reporting. Six items were rated as of intermediate importance for reporting.

The second sub-category under 'Environmental performance' was 'Water consumption'. This sub-category had eight items. All items under the 'Water consumption' sub-category was rated as important except the item related to total percentage of water lost through the process with a score of intermediate importance.

The third sub-category under the 'Environmental performance' category was 'Land use and biodiversity' with seven reporting items. Under this sub-category, four items were rated as important and three items as of intermediate importance for reporting (see Table 6.4). The fourth sub-category under 'Environmental performance' was 'Materials and other resources used', with four rated items. Under this sub-category, two items were rated as important and two items were rated as of intermediate importance (see Table 6.4).

The last sub-category under 'Environmental performance' was the 'Emission of effluent, waste and other emissions into the air' with 12 items rated for importance. From this sub-category 10 items were rated as important and the remaining two items were reported as of intermediate importance (see Table 6.4)

To summarise, the ratings given by the experts in the final disclosure index were added to get a total score (i.e. the maximum scores) for each category or sub-category (see Table 6.5). The total score obtained was used as the benchmark in

assessing the extent of environmental reporting as discussed in Chapter seven of this thesis.

Table 6.5: A summary of reporting weight for each reporting category

Category	Scores
1. Organisational context	32
2. Management performance, policies and systems	87
3. Environmental performance	
3.1 Energy consumption	62
3.2 Water consumption	31
3.3 Land use and biodiversity	25
3.4 Materials and other resources used	14
3.5 Emission of effluent, waste and other emissions into the air	46

Source: Author's compilation

In response to part of the research question "Which environmental information do stakeholders require", the answer can be summarised as follows. The stakeholder requires a variety of information ranging from general information to more specific information. In particular, as indicated in Table 6.3. stakeholders require the organisation to provide information on organisational context as this information gives the reader an understanding of the activities, services and operations of reporting organisations and how the organisation itself is committed to environmental protection issues. In the same way, the stakeholders require the organisation to report information related to management performance, policies and systems. As such, information provides the reader information related to management efforts and capability in managing issues that have influence in the environmental performance of the organisation. Lastly, stakeholders require

organisations to report information related to environmental performance. This information enables the reader to understand specifically how the operations of the organisation have been improved to reduce its impact on the environment. In terms of environmental performance, energy consumption, water consumption, waste management and GHG emission are some of examples that could be reported.

Therefore, the EDI that was developed is used in Chapter 7 for determination of the extent of environmental reporting in Tanzania and later (see Chapter 8) in the development of the ERF for the Tanzanian industrial sector.

6.5 CHAPTER SUMMARY

The development of the EDI involved two major steps. The first step involved identification of the items to be reported from the literature. The second step involved identification of the experts to be included in the Delphi inquiry panel in order to validate the items proposed in the first step. A total of 30 experts agreed to participate in the study. The Delphi inquiry was conducted in three rounds.

In round one, 30 experts were supplied with the initial EDI, and 25 experts responded. In round two, the EDI was supplied to 25 experts of whom 22 responded. In the third round, the index list was circulated to 22 experts, and they all responded.

During the Delphi inquiry, the initial disclosure index sent to experts for their opinion included a total of 71 items. During the Delphi process, two proposed items were deleted and nine new items were added. One item proposed was split into two items and ten proposed items were modified; hence, the final reporting index consisted of 79 items, which was sent for weighting according to their importance.

The weighted disclosure index indicated that most of the items in the disclosure index were rated as important (i.e. scored 4). Few items were rated as having intermediate importance (i.e. scored 3). No item was rated as very important by the experts. Also, none of the item was considered to be unimportant. Generally, for

organisations to be rated as reporting important information it is expected to report those items which have been rated high by experts. Therefore, the weighted disclosure index indicated that the maximum score that could be attained by an organisation reporting environmental information for each category is –

32 – for organisational context;
87 – for management performance and system;
62 – for energy consumption;
31 – for water consumption;
25 – for land use and biodiversity;
14 – for material and other resources used; and
46 – for emission of effluent, waste and other emissions into the air.

The next chapter present the results for assessment of the extent of environmental reporting in Tanzania.

CHAPTER 7

EXTENT OF ENVIRONMENTAL REPORTING IN TANZANIA

7.1 INTRODUCTION

After the development of the environmental reporting disclosure index, the next step was to determine the extent of environmental reporting in Tanzania. The assessment of the extent of environmental reporting provided an understanding regarding environmental reporting practices in Tanzania at the time of the research. In particular, the author had the opportunity to understand the items, which are frequently reported by organisations and to compare them with items suggested to be reported by stakeholders.

The chapter therefore presents the results for the extent of environmental reporting in Tanzania. Section 7.2 presents a discussion on the number of organisations who participated in the study. The discussion of how the environmental information was extracted from annual reports and environmental reports is presented in section 7.3. Finally, section 7.4 presents the results for the extent of environmental reporting in Tanzania. The extent of environmental reporting was determined by looking at both quantity of environment information and level of importance of information reported. The quantity was determined by counting the number of sentences related to the environment as reported by organisations in both annual and environmental reports. The level of importance of environmental information reported was determined by using the weighted disclosure index developed in this study**.**

7.2 ORGANISATIONS INCLUDED IN THE STUDY

In order to examine the extent of environmental reporting in Tanzania, organisations from various industrial sectors, such as mining, cement, pulp and paper, sugar, chemicals and chemical products, pharmaceuticals, beverages, food and water,

leather, fertilisers, plastic and rubber, lubricants, tobacco, water supply and sanitary services and health centres and hospitals were contacted to participate in the study. A total of 238 organisations were contacted to participate in the study. Only 150 organisations replied to the request. Out of the organisations who replied, 65 refused to participate in the study and 85 organisations agreed to participate in the study. Among of the reasons given by those who refused to participate in the study was that they were not preparing the reports requested, while others refused to provide the reports claiming that the requested information was classified information, which could not be accessed by non-employees, and yet others said their activities did not have a significant impact on the environment. Organisations who agreed to participate in the study were requested to provide the annual reports and environmental reports for 2015 in order to determine the extent of environmental reporting in Tanzania. Since the aim of the study was to examine the extent of environmental reporting and not to find the best reporter, it was decided that the organisations who agreed to participate would remain anonymous in order to maintain their confidentiality.

Table 7.1 shows the number of organisations that agreed to participate in the study from various industries. Organisations from fertilizer, Pulp and paper, glass and Retail petroleum industry did not respond to the request to participate in the study.

Table 7.1: The number of organisations agreed to participate in the study

S/N	Category	Number of organisations requested to participate	Number of organisations agreed to participate	Percentage participation
1	Breweries	2	2	100
2	Sugar manufacturing	4	3	75
3	Steel mills	13	5	38
4	Cement mills	5	4	80
5	Textile mills	9	4	44
6	Leather industry	9	4	44
7	Mining	8	5	63
8	Plastics and rubber	34	10	29
9	Lubricants	2	2	100
10	Pharmaceuticals mills	6	4	67
11	Chemical and chemical products	21	5	24
12	Energy, electrical machinery and equipment and electronics	15	4	27
13	Food and beverages	74	15	20
14	Metal products	20	5	25
15	Tobacco processing and products	3	3	100

S/N	Category	Number of organisations requested to participate	Number of organisations agreed to participate	Percentage participation
16	Water supply and sanitation services	5	5	100
17	Health centres and hospitals	8	5	63
	Total	238	85	36

Note: S/N = serial number

Source: Author's compilation

As indicated in Table 7.1, reports for 85 organisations were collected and read. However, out of the reports collected, only 20 (i.e. 24%) organisations' reports contained environmental information. The remaining 65 (i.e. 76%) organisations' reports contained no environmental information. Organisations from textile, leather, plastic and rubber, lubricant, chemical and chemical products, water supply and sanitation and health centres and hospitals did not report any environmental information in their annual reports. Again, out of 20 organisations who reported environmental information only six organisations (i.e. A, C, D, E, Q and R) had both annual reports and environmental (sustainability reports). The remaining organisations had only annual reports. In addition, five (i.e. A, C, D, E and R) of the annual and environmental report accessed was for groups.

Table 7.2 shows the list of organisations whose reports contained environmental information.

Table 7.2: List of organisations who reported environmental information

S/N	Organisation	Industry
1	Organisation A	Mining
2	Organisation B	
3	Organisation C	
4	Organisation D	
5	Organisation E	Cement
6	Organisation F	
7	Organisation G	
8	Organisation H	
9	Organisation I	Breweries
10	Organisation J	
11	Organisation K	Food and beverages
12	Organisation L	
13	Organisation M	Energy, electrical machinery and equipment and electronics
14	Organisation N	
15	Organisation O	Tobacco processing and products
16	Organisation P	
17	Organisation Q	Sugar
18	Organisation R	Metal products
19	Organisation S	Pharmaceuticals mill

S/N	Organisation	Industry
20	Organisation T	Steel mill

Note: S/N = Serial number

Source: Author's compilation

7.3 EXTRACTION OF ENVIRONMENTAL INFORMATION FROM ANNUAL REPORTS AND ENVIRONMENTAL REPORTS

In order to extract the required environmental information from annual and environmental reports, the content analysis approach (see United States General Accounting Office 1989) was used. The unit of analysis used to codify environmental information from reports was the sentence. The sentence is more suitable for providing meaningful inferences from narrative statements (Guthrie *et al*. 2008:39). The sentence is easily identified and allows the disclosure to be refined more and more (Elijido-Ten 2004:14) and is less subject to inter-judge variation than clauses, phrases or themes (Hasseldine *et al*. 2005:236). The process of extracting environmental information from the reports was guided by decision rules for environmental disclosure as modified from AbuRaya (2012) (also see Appendix B). Likewise, the coding framework used was adapted from previously published work (Schneider & Samkin 2008) (also See Appendix C). During the coding, each sentence from every report was read to identify whether it was about the environment or not. If the sentence was about the environment, it was further analysed to identify in which category the sentence belonged (i.e. 'Organisational context', 'Management performance, policies and systems' or 'Environmental performance'). Furthermore, after identifying to which category the sentence belonged, the level of importance was assigned to that item. Four or five numerical codes were assigned for each sentence with environmental information. The importance score (final score of 4/5) was allocated for each item related to the environment as indicated in the weighted disclosure index (see Table 6.4).

A sentence with no environmental information was assigned a code of 0000. For example, a sentence such as “we have implemented an environmental management system which is in line with the ISO 14001” was assigned a code of 1214, i.e. –

1-the information is about the environment;
2-the sentence belongs to the category ‘Management performance, policies and systems’;
1-the sentence is concerned with the EMS available; and
4-the importance score as indicated in weighted disclosure index.

After completing the coding of all sentences in a report, the codes were analysed and aggregated into three categories, and the score for each company was determined (see Table 7.5).

The following is an extract of environmental information from annual or environmental reports from various organisations, which disclosed environmental information. The information extracted from the annual reports is presented by following the order in which the categories are arranged in the weighted disclosure index (see Table 6.4)

7.3.1 Organisation A

Under the category ‘Organisational context’, Organisation A provided information related to organisational profile and compliance requirements, such as rehabilitation of the environment and compliance with the International Cyanide Management Code (for the Manufacture, Transport and Use of Cyanide in the Production of Gold) (commonly known as ‘the Cyanide Code) (see International Cyanide Management Institute 2002). The organisation reported information related to occupational health and safety together with the initiative to improve the health and safety performance

of the organisation. However, no information related to policy in occupational health and safety was disclosed.

Under the category 'Management performance, policies and systems', the organisation reported to have an EMS that is in line with ISO 14001. The organisation also reported that it provided training to site environmental teams to enhance the ability to identify and manage the environmental risk in the organisation. However, the organisation did not mention the actual number of staffs who received such training. Further, the organisation reported to be involved in community issues. It reported that a total of US$12.9 million was allocated for community-related activities, such as improving health centres, secondary schools, revamping water system and supporting sports. In addition, the organisation reported to have grievance handling mechanisms at all its sites, which resulted in an increase in grievances reported in 2015 compared to 2014. Provisions for environmental rehabilitation after the closure of mines were reported.

Under the category 'Environmental performance', the organisation reported on GHG emission where a total of 370,092 tonnes carbon dioxide (CO_2) from GHG was reported in 2015. Likewise, the organisation reported information regarding energy consumption claiming that consumption was reduced by 12% compared to 2014. However, the actual amount of energy consumed was not disclosed. Regarding water use, the organisation reported that they had reduced water consumption by 4% without providing any previous information to enable comparison.

7.3.2 Organisation B

In the same way, under the category 'Organisational context', Organisation B reported items related to its profile. The organisation also reported information related to occupational health and safety stating that in 2015 it managed to –

- develop an integrated safety management system;

- improve the hazard identification and reporting system;
- install radio communication systems in all mine vehicles; and
- comply with legal requirements, (such as audits by the occupational safety, health administration and fire and rescue force).

Furthermore, the organisation managed to –

- implement programmes for employee wellness;
- conduct assessments for occupational health and fitness for all mine employees; and
- provide training on HIV/AIDS awareness and prevention.

The organisation reported that it maintained a policy of zero tolerance related to negligence of health and safety best practices. However, the organisation did not provide information regarding the availability of a health and occupational policy. Regarding the issues related to environmental compliance requirements, the organisation reported that it had an environmental management programme, which ensured the organisation operated in line with local legislation, but without specifying those legislations.

Under the category 'Management performance, policies and systems', regarding issues of training, the organisation reported that it had instituted different training and development programmes to upgrade the level of all employees. The organisation did not report whether it had specific training related to environmental awareness or not. The organisation also reported that it was involved in community issues, such as supporting the building of school classrooms, maternity wards dispensary and community water support during the dry seasons. However, it did not report on the actual amount of money allocated for those activities. In addition, the organisation reported information related to environmental monitoring and audit programmes. Specifically, the organisation monitored, audited and reviewed

environmental performance, including prevention and reduction of environmental impacts. The organisation also reported information related to environmental liabilities under applicable laws and regulations according to which cost related to decommissioning and site rehabilitation have been accounted.

Under the category 'Environmental performance', the organisation reported that the use of diesel had been dropped in 2015 due to commissioning of heavy fuel oil power generation. A total of 19,811 MWh (megawatt hour) of power was generated by a generator and 96 MWh from solar power.

7.3.3 Organisation C

Under the category 'Organisational context', various items were reported by Organisation C. The information related to the organisational profile was reported and the report included the commitment from the CEO regarding environmental caring. According to the statement by the CEO, the organisation was striving to reduce energy use and the carbon footprint as the initiatives for energy saving were in place in all existing operations. Regarding the issue of environmental compliance and obligations, the organisation reported various Acts and regulations with which it had to comply in order to continue to operate. The organisation has a health, safety and environmental (HSE) policy, which sets out standards of environmental performance across all their operations. The organisation further reported on its main environmental risks in its operations, such as the discharge of substandard effluent to water sources nearby, unsustainable energy consumption, degradation of faunal habitat and the impact of climate change in particular affecting the availability of water.

Under the category 'Management performance, policies and systems', the organisation reported to have an EMS in each mine, which was ISO 14001-certified. In particular, the EMS provided detail on how the environmental risks are identified

and how the plans to mitigate the impact of organisation activities are implemented. All operations have approved environmental management programmes (EMPs). Generally, these EMPs comprises EIAs by which all plans to address impacts arising during operations and closure phases are covered. The organisation further reported that its operations were subject to regular environmental audits both internal and external. Four types of audit have been reported, namely legal compliance audit, EMP performance assessments, internal environmental management audits and external ISO 14001 audits.

Furthermore, the organisation reported compliance with the ISO 31000 risk management standard, which requires organisations to identify hazards and risk assessments continually. Resource consumption, chemical management and response to emergency situations were reported to be the top significant environmental risks. The organisation also had in place a system to minimise environmental incidents, and such incidents were classified according to their severity from minor to major. For the past seven years, no major environmental incidents have been reported. The organisation also reported its awareness of climate change and energy usage. The organisation has a carbon reduction strategy, which focuses on the following goals: efficient use of energy, decreased dependence on non-renewable energy, and improving stakeholder education and awareness in order to promote environmental sustainability. Further, the organisation reported that it had programmes to reduce emission intensity by reducing reliance on fossil fuel and minimising overall energy usage. Various energy efficiency processes have been implemented. The organisation also reported partaking in voluntary reporting to the Carbon Disclosure Project (CDP) (see CDP 2018). In addition, the organisation had a water management strategy that aimed to use water efficiently and prevent contamination of water sources. Regarding the issue of training, a total of US$53,443 was spent for training employees although no details regarding provision of training on environmental issues were reported. In the

same way, the organisation also contributed to community development and its focus was on the provision of sustainable job creation, skills transfer (training and education), enterprise development and infrastructure development. The report indicated that a total of US$407,384 was spent in 2015 on providing educational infrastructure, improvement of health facilities, assisting vulnerable groups, establishment of children's parks for entertaining children, educational services on important topics, such as environmental and HIV awareness at schools and a supply of 1,000+ desks to surrounding village schools.

Under the category 'Environmental performance', the organisation reported that at the time of reporting, the majority of energy used in their operations was externally supplied by Tanzania Electric Supply Company Limited (TANESCO) and the total of energy consumed represented 15% of the total cash on-mine costs in 2015. Further, it was reported that the total electrical energy usage had increased to 12% compared to the previous year due to expansion of the organisation. Despite the increase in energy use due to expansion, the organisation reported a decrease in energy use per tonne by 2% due to increase in production.

The organisation further reported that water use in 2015 increased by 2% to 40,179,468m^3 from 39,442,203m^3 in the previous year use due to expansion. The major sources of water were rivers and groundwater. However, the organisation reported that water used in operations was mainly recycled production water. The organisation further reported a decrease in water usage per tonne by 11% to 1.97m^3/t from the previous year's 2.23m^3/t. The decrease in water usage was due to various improvement projects available to all its existing operations. The target was to achieve usage of 1.55m^3/t in 2020.

Regarding the issues related to biodiversity and land usage, the organisation reported that it recognised the effect of their activities on biodiversity in the regions where they operated, and their aim was to protect the local habitats. The

organisation reported that none of the operations were located near or in protected areas. Further, the organisation reported that it had established more than 9,800 ha of land for local vegetation and wildlife protection. A total of 108 invasive plant species had been reported to be managed in all existing operations. The organisation further reported that before embarking on greenfield development, all operations conducted baseline biodiversity assessments during which identified species were being listed. Where appropriate, protected plants are being transferred to areas where they will not be disturbed. A total of 10,042 ha of land had been reported as disturbed by the activities of the organisation, and a total of 5,418 ha still needed rehabilitation.

Regarding the issue of emissions into the air, the organisation reported an increase in carbon emission by 13% to 654,584 tCO_2e (tonnes of carbon dioxide equivalent) compared to 578,073 tCO_2e due to an increase in energy consumption as a result of expansion of the organisation. Despite the increase in carbon emissions, the organisation had set a strategy to reduce its carbon emission by 1% per carat mined annually for five years (2015–2020). Regarding other air emissions, the organisation reported it had no significant air emissions as their activities did not lead to production of nitrogen oxides (NOx) or sulphur oxides (SOx).

On the other hand, the organisation reported on how it managed waste. For each operation, the waste management objectives and targets were set. In particular, the waste generated was optimised by recycling and through wastage prevention. For instance, a total of 5,231 tonnes were recycled in the course of the year compared to 3,825 tonnes recycled during the previous year. In addition, the organisation reported that it contracted organisations who were reputable for handling waste and who complied with legal requirements when awarding tenders. Most of these organisations were ISO 14001-certified, which raised the credibility of the organisation as the waste was handled and disposed of in a responsible manner.

The organisation further reported that all sites handling waste were regularly audited internally and externally as part of the requirements of ISO 14001. Regarding transportation of hazardous waste, the organisation was strictly adhering to the Basel Convention (see UNEP 2014) in terms of which all waste generated is disposed of or recycled within the country of origin.

7.3.4 Organisation D

Under the category 'Organisational context', the information related to organisational profile was reported. The report also contained a statement on environmental commitment by top management. The CEO recognised the responsibility of the organisation in ensuring environmental protection and management. Specifically, the organisation was committed to minimise waste, prevent air pollution and make efficient use of natural resources. Regarding safety issues, the CEO's statement declared that safety was still the sole main challenge and the organisation aimed to achieve an occupational injury-free and disease-free place of work. The remaining items under this category were not reported.

Under the category 'Management performance, policies and systems', the organisation reported that each site is certified according to the ISO 14001 standard and this is updated regularly to comply with the regulatory requirements. The organisation reported that it complied with the best practice of tilling management set by the International Commission on Large Dams (ICOLD). Furthermore, the organisation reported that it was in the process of getting certification under the Cyanide Code. The organisation also reported carbon emission to CDP annually. Regarding the issue related to training in environmental awareness, only artisanal miners have been reported to receive such training. The environmental liabilities for meeting legal requirements related to decommissioning and restoration costs amounting to US$683.1million, were also reported by the organisation. In Tanzania, US$56.2 million was estimated to be used for such purpose. The report further

indicated that the organisation involved itself with supporting the community and the focus area was enterprise development, infrastructure development and health and educational skills development. Specifically, in Tanzania, the organisation commenced a five-year project in the area of agriculture and SMEs. The agriculture project supported the cultivation of sunflower and paddy and more than 800 acres have been established. Regarding SMEs, the project provided support in areas such as welding and fabrication, garment manufacturing, and hydra-form brick making. Furthermore, in collaboration with government, sanitation authorities and the community the organisation has managed to deliver water to 130,000 residents in 2015. In general, the organisation (group) spent about US$15.2 million in community investment out of which US$3.757 million was spent in Tanzania. In addition, in 2015, four environmental incidents occurred but no incidents from Tanzania was reported.

Under the category 'Environmental performance', the organisation reported that in terms of energy consumption, its main source of energy comes from fossil fuel; however, other operations use mixed sources. In 2015, the total energy used by the organisation (as a group) comprised 29.4 petajoules and intensity of 315 megajoules (MJ) per tonne. In Tanzania, 2.93 petajoules was used. No other items were reported under the energy consumption category.

On the other hand, the organisation also provided information related to water consumption. At the time of reporting, the target of the organisation was to minimise the use of fresh water and the safe discharge of used water. Therefore, the organisation minimised the use of fresh water by using recycled water, and water planned for release is tested to check whether it meets the standard before discharging. The amount of water recovered and recycled is 40-70% of water sent to tailings storage facilities. At the time of reporting, the main sources of water used by the organisation were underground water, surface water and other external water

supplies. The source mainly used by the organisation was surface water followed by groundwater and another external source. In 2015, 60 gigalitres of water were used. In Tanzania, the total amount used was 3,249 megalitres.

Regarding issues related to 'Emission of effluent, waste and other emissions into the air', the organisation admitted that it contributed to GHG emission through its operations as well as from electricity purchased. In 2015, the organisation emitted 4.3 megatonne of CO2e (carbon dioxide equivalent) and emission intensity was 46 kilo tonne CO2e/t (carbon dioxide equivalent per tonne)

7.3.5 Organisation E

Under the category 'Organisational context' few items were reported by Organisation E. Information related to organisational profile, top management commitment and the establishment of environmental targets and objectives was given. Specifically, the CEO recognised sustainability as one of the pillars of their strategy and climate change as one of the major challenges for businesses globally. The organisation therefore took into consideration the action to mitigate climate change by looking at the entire life cycle of materials from their production to their use. Regarding environmental targets and objectives, the organisation reported various targets and objectives to be attained by 2030. For instance, reduction of net carbon dioxide (CO_2) per tonne of cement by 40% vs. the 1990 emission, use of 80 million tonnes of waste resources in energy production, and the reduction or withdrawal of fresh water for cement production by 30%. The organisation also reported that the health and safety of its people was priority number one and the objective was to reach zero harm.

Under the category 'Management performance, policies and systems', the organisation reported to have both sites with EMS equivalent to ISO 14001 (72 sites) and certified according to ISO 14001 (71 sites). However, no information was

reported to identify whether the plant operating in Tanzania was ISO 14001-certified or not. The organisation was also involved in community matters and a total of US$ 59.65 million was reported to have been spent on various projects, such as education, infrastructure, health, water and donations. In particular, the organisation involved itself in empowering women because it believes that when women are equipped with resources they have the ability to uplift their entire family and the whole community. Likewise, the organisation reported spending on various issues related to environmental investments and compliance. For instance, a total of US$73.9 was spent as environmental investment, a total of US$995.5 million as provision for site rehabilitation and other environmental liabilities, and US$56,143 was linked to penalties and fines. Again, no specific information was given about the total amounts that had been allocated to plants operating in Tanzania. Regarding the issue of training, the organisation reported having projects, which dealt with educating both employees and the local community on the importance of preserving biodiversity. Further, specific training was given to staff on how they could improve the emission performance of the group.

Under the category 'Environmental performance', the organisation reported various issues. Regarding energy consumption, the organisation reported that, despite the increase in production by 96% since 1990, the annual energy consumption had increased by only 29% while consumption per tonne of clinker was only 3,533 megajoules (MJ) in 2015 compared to 4,542 megajoules (MJ) in 1990. Specifically, the organisation reported total a power consumption of 26,896-gigawatt hours (GWh) in all segments and a total of 688 million gigajoules (GJ) fuel consumption in all segments. Further, the organisation reported the thermal energy mix for clinker produced. The report indicated that –

- 39.1% of thermal energy came from coal;
- 28.0% came from petroleum coke;

- 4.4% came from heavy fuels;
- 12% came from gas;
- 1.4% came from other traditional fossil fuels;
- 9.8% came from alternative fossil fuel (excluding biomass); and
- 5.3% came from biomass.

The organisation had a strategy to ensure that it substituted the use of fossil fuel with the waste resources from industries and municipalities for their production process. The target was to use 80 million tonnes of waste per year by 2030. In 2015, the organisation used 54 million tonnes of waste in energy production.

Moreover, the organisation reported information related to water withdrawal and water consumption. The report showed that 315 litres of fresh water were withdrawn per tonne of cement produced, and 123 million m^3 were consumed. The strategy of the organisation was to reduce the water withdrawal for cement production by 30% by 2030. The report also showed that the consumption per tonne had been reduced by 14% due to improvement in efficiency of using water since 2010. The organisation reported that in water-scarce areas, the strategy of the organisation is to reduce the consumption of fresh water and instead maximising the use of rainwater harvested and recycling waste water. The organisation also reported that in areas with scarce water, they are obliged to ensure they provide water of good quality to the surrounding community.

The organisation further reported information related to land use and biodiversity. The report points out that the biodiversity in sites is managed by engaging experts and the local stakeholders to protect the natural capital. The strategy of the organisation is to avoid opening new quarries in areas that are protected and in world heritage sites. The objective of the organisation is to enhance biodiversity by ensuring 100% of quarries and cement organisations implement biodiversity

management plans (BMPs) by 2020. The performance report indicated that in 2015, the BMP had been implemented by 44.3% and in areas with high biodiversity value, almost the BMP has been completed.

Regarding the information related to emissions of effluent, waste and other emissions into the air, various issues were reported by the organisation. The organisation reported a total scope 1 emission of 165 million tonnes, scope 2 emissions of 16 million tonnes, and scope 3 emissions of 40 million tonnes. In general, the reduction of carbon dioxide (CO_2) emission of 4 kg per tonne of cement was reported. As a result, 32 million tonnes of carbon dioxide (CO_2) emission of scope 1 was reduced in 2015. This accomplishment was due to the use of more efficient kilns and the use of biomass (8%) as substitute for conventional fuel. The organisation added that it is difficult to reduce scope 2 emission as it involves major capital investment. Therefore, the target of the organisation is to reduce scope 1 carbon dioxide (CO_2) emission by 33% per ton of cement by 2020. In addition, the organisation has a target to reduce other emissions (i.e. nitrogen oxides (NO_x), sulphur oxides (SO_x), dust and mercury) from the cement making process by 2020. The target is to reduce dust emission per tonne of clinker by 50%, with no kiln emitting more than 50 mg/Nm3, to reduce oxide of nitrogen (NO_x) emissions per tonne of clinker by 25%, to reduce sulphur oxide (SO_2) emissions per tonne of clinker and mercury emission per tonne of clinker by 30%. The performance shows that compared to the 2010 baseline, reduction in all four areas had been achieved. The organisation is further attempting to develop a low carbon cement product, which will have a smaller environmental footprint than current ordinary Portland cement.

7.3.6 Organisation F

Under the category ‘Organisational context’, Organisation F reported information related to only two items, i.e. organisational profile and environmental management

policies and systems. Regarding the issue of environmental management policies and systems, various policies (such as environmental policy, CSR policy and occupational health and safety policy) were disclosed. In particular, under the environmental policy, the organisation recognises the right of the present and future generations to reside in a safe environment. Therefore, the organisation is committed to ensure that their operations related to cement processes and products are conducted in a way that minimises the adverse effect on both the community and the environment. In addition, the focus of the CSR policy is to build and maintain good relations with all stakeholders. Specifically, it aims to improve the quality of life of the employees, their families and the community surrounding the organisation. On the other hand, the occupational health and safety policy intends to minimise injuries in the workplace, and the objective is to have zero harm. Other items in this category were not reported.

Under the category 'Management performance, policies and systems', the organisation reported to have an EMS which is ISO 14001-certified. The organisation was also involved in CSR and a total of TZS104 million was spent towards various activities, such as building classrooms and repairing school infrastructures, supporting flood victims and conservation of the environment. In the same way, a total of TZS145.602 million was reported as provision for quarry and site rehabilitation and 30 hectares were reported to be rehabilitated. Likewise, a total of TZS388 million was spent on training staff; however, no information was provided to indicate whether training related to environmental awareness was offered.

Under the category 'Environmental performance', no information was provided despite the statement from the chairman claiming that the environmental performance is on track and the average monthly emissions are below the legal limit throughout the year.

7.3.7 Organisation G

Under the category 'Organisational context', only information related to the organisational profile was reported and other items were not reported. Under the category 'Management performance and systems', a few items were reported. The organisation has an EMS, which is ISO 14001-certified. As part of the risk management strategy, the organisation has implemented an occupational health and safety management system, which has been certified by the Occupational Health and Safety Assessment Series (officially BS OHSAS 18001). Furthermore, the organisation reported that a total of US$1.2 million was spent to repair dust filters to reduce emissions to acceptable levels authorised by the NEMC. Furthermore, a 2.5megawatt (MW) generator was installed to guarantee the operation of the kiln and a total of US$ 1.7 million was reported to be invested for the activity. The organisation also moved from using heavy fuel oil to natural gas for firing the kiln, and they replaced the bag filters. This move resulted in a reduction of gases and dust emissions. Moreover, the organisation became involved in CSR activities and a total of TZS 301 million was spent.

Even though cement organisations consume large amounts of energy, water and limestone and emit dust, gases noise and particulates from the kiln, no information related to environmental performance was reported.

7.3.8 Organisation H

Organisation H reported only information related to the organisational profile, leaving the other items unreported under the category 'Organisational context'. Under the category 'Management performance, policies and systems', some items were reported. The organisation reported having an EMS, which is ISO 14001-certified in all its plants. Likewise, the organisation maintains an Occupational Health and Safety Management System (OHSMS), which is BS OHSAS 18001-certified to

prevent accidents and illness of workers. Furthermore, various measures have been implemented to ensure the operations are sustainably managed, such as:

- electrostatic precipitators have been installed at all plants to minimise dust emission;
- use of natural gas to reduce GHGs;
- use of covered conveyors to carry limestone from mines to plants instead of trucks to minimise dust emission; and
- use of rain water for cooling purposes and recycling of waste water.

The organisation engages in providing training to its employees; however, no training related to environmental awareness was reported. The organisation is also involved in social investment. The organisation

- provides support to entrepreneurs;
- provides health support by building hospitals and/or health care centres; and
- promotes education by building classrooms and distributing books.

In addition, the organisation reported that it is engaged in rehabilitation of mined sites by planting trees and grass. The organisation did not report any information related to environmental performance.

7.3.9 Organisation I

Organisation I reported two items, i.e. organisational profile and establishment of environmental targets and objectives under the category 'Organisational context'. In particular, the target of the organisation is to reduce energy and water use by 9% per annum.

Under the category 'Management performances, policies and systems', the organisation reported to have a department, which is concerned with health and safety to ensure that employees and contractors are working in a safe environment.

All plants are audited annually by the National Occupational Safety Association (NOSA). Likewise, the organisation engages in social investment. A total of TZS 555 million has been invested and about 280,000 people in the country have been supplied with safe and clean water. In addition, the organisation participates in reforestation activities and about 4,000 trees have been planted in areas of their operations. The organisation also provides training to employees; however, no training related to the environment was reported.

Under the category 'Environmental performance', no comprehensive information was reported. As a strategy for reducing energy consumption, the organisation has fitted devices in heavy machines to measure, analyse and optimise consumption of energy at each plant. In the same way, all plants have been fixed with solar panels, energy-saving light bulbs and biogas (as fuel for boilers). In addition, the organisation reported that water consumption was minimised by ensuring that water was used efficiently and recycled as much as possible. Despite the strategy mentioned, no information regarding total energy and water usage was reported by the organisation. Furthermore, the organisation reported that as a strategy to reduce waste, bottles sold to retailers are returned and recycled. About 93% of bottles sold are returned and recycled. Leftovers seeds from the brewing process are sold to the local community for feeding animals.

7.3.10 Organisation J

Only information related to the organisational profile was reported under the category 'Organisational context'. Under the category 'Management performances, policies and systems', Organisation J reported to have a zero-harm culture according to which employees, customers, contractors and visitors are given top priority by ensuring that they are working and moving in a safe environment. The organisation provides various types of training on safety, such as first aid and firefighting to build and improve safe working conditions of their employees. The

organisation also engages in social investment by enabling people to access safe water and sanitation services. The organisation completed the construction of three boreholes in two districts (i.e. Songea and Temeke) and 420,000 people have benefited. Moreover, the organisation is involved in environmental conservation by planting trees. More than 4,000 trees have been planted to support environmental conservation efforts in Tanzania. The organisation reported no information related to environment performance.

7.3.11 Organisation K

Under the category 'Organisational context', only information related to organisational profile was reported. However, under the category 'Management performance, policies and systems', a few items were reported. The organisation engages in CSR issues. For instance, the organisation provides support to tea growers by providing training and education, funding for fertilisers and other inputs to ensure they produce tea of required quality. The organisation further reported that they were ISO 22000-certified (food & safety) and complied with Rainforest Alliance Standards (see Rainforest Alliance 2017). As part of compliance with the standards, the organisation provides training on good agricultural practices, the safe disposal of used containers, and the use of pesticides. A total of TZS14.4 million was spent on training staff; however, no information was disclosed on whether training related to environmental awareness was given. The organisation also had a safety committee and all employees and contractors were assured of a safe working environment by providing them with protective equipment, training and supervision.

Under the category 'Environmental performance', the organisation reported that they used wood as source of energy in their manufacturing process. To ensure the sustainability of the forest, harvesting the immature forest is discouraged, and the organisation refrains from buying firewood harvested from immature forests. No other items in this category were reported.

7.3.12 Organisation L

Under category 'Organisational context' the organisation L reported only the information related to organisational profile. Other items under this category were left unreported. No information was reported under the category of 'Management performance, policies and systems'. However, under the category of 'Environmental performance' the only information reported by Organisation L related to type of energy used by the organisation in its processes. In particular, the organisation reported that it used biomass (such as coffee husk, rice husk and saw dust) in steam generation as a way to reduce pollution. The organisation pointed out that biomass is an eco-friendly source of energy compared to fossil fuel, as emissions generated are clean compared to those generated by fossil fuel.

7.3.13 Organisation M

Under category 'Organisational context' organisation M reported that they had an environmental policy and complied with various regulations related to the environment and pollution in Tanzania. However, no specific regulation was mentioned. The issue of health and safety was also taken into consideration and the organisation ensures a culture of safety is present all the time. In particular, the organisation provides personal protective equipment to all employees and contractors. In addition, regular health check-ups are done on employees to comply with regulations. Under category 'Management performance, policies and systems' organisation M reported that they participate in social investments. In 2015, the organisation constructed four classrooms in two districts. Other items were not reported. No information under the category 'Environmental performance was provided.

7.3.14 Organisation N

Under the category of 'Organisational context' organisation N reported that they complied with the EMA, the EIA and audit regulations of 2005. Regarding health and safety regulations, the organisation reported that an occupational health and safety policy was maintained and regularly updated and ensured that it is adhered to by all employees. Under the category of 'Management performance, policies and systems' the organisation reported that they had inspection and training on fire safety for all regions and power-generating plants. In addition, the organisation trained 1,947 members of staff in various programmes to improve the skills and capacity. The amount spent in this regard was TZS 1.7 billion. The organisation was also involved in social investment and they provided medical services to Tanzanians who lived near the hydropower stations. They also provided desks, chairs and transportation services to enhance the learning environment for primary pupils. However, no information related to training on environmental issues was disclosed. No information under the category of 'Environmental performance was given.

7.3.15 Organisation O

Under the category 'Organisational context' organisation O reported compliance with health and safety legislation and the organisation's Environmental, Health and Safety (EHS) standard went beyond legal requirements. Specifically, the standard required all employees to receive training in health and safety and to observe safe working practices. In addition, employees are required to report near accidents, accidents and unsafe behaviour and conditions. Moreover, Under category 'Management performance, policies and systems' the organisation reported that they invested in the community, and the purpose is to ensure that the quality of life of the community is improved. In particular, in 2015, in partnership with an NGO, it managed to alleviate poverty of 300 women in the Mwanza region. Furthermore, the organisation provided support to a non-profit organisation (Vipaji Foundation), which

promotes local arts and culture in Tanzania). However, no financial information regarding the amount spent on these activities was disclosed. No information under the category of 'Environmental performance' was disclosed.

7.3.16 Organisation P

Under the category 'Organisational context' organisation P reported compliance with health and safety standards established by OSHA. Under the category of 'Management performance, policies and systems' the report indicated that organisation P was certified with both ISO 14001 and ISO 9001. Again, the report showed that the organisation engaged in social investment. In 2015, a total of TZS82 million was donated to various schools and charitable organisations. No information was provided under the category of 'Environmental performance'.

7.3.17 Organisation Q

Under the category 'Organisational context', only a few items were reported. The organisation reported to have a risk and environmental management policy, which aims to prevent contamination and to preserve the environment. Direct environmental impact of the organisation comes from agricultural and manufacturing processes. The manufacturing processes by the organisation consume water and energy and generate solid waste, effluent and emissions into the air. Therefore, the water, energy and effluent emissions into the air and biodiversity have been identified as significant environmental indicators for the organisation. Moreover, the organisation reported to have a risk management committee, which was responsible for identifying, among others, environmental risks, the probability of their occurrences and their impact on the environment. In particular, the organisation reported that a weather risk was a significant risk to a business and various controls have been implemented by the organisation against adverse weather conditions.

Under the category 'Management performance, policies and systems', a number of items have been reported. Environmental management was put into practice according to the NOSA and ISO 14001. The organisation was committed to ensure that risk of injury or diseases were minimised, and employees were working in a healthy and safe environment at the time of this research. The organisation reported further that they trained 88 representatives in areas related to safety, health and environment. The organisation was also involved in community investment. In partnership with a charitable trust, they had managed to support infrastructure development, supply of drinking water, supply of medical equipment and classroom construction. In addition, 8,000 registered sugar cane growers were also supported by the organisation through a capacity building programme.

Under 'Environmental performance', various items have been reported. As discussed earlier the major environmental impact associated with the activities of the organisation came from agricultural and manufacturing processes. Energy, water usage, effluent, emissions into the air and biodiversity have been identified as significant environmental indicators for the organisation. Regarding energy consumption, the organisation reported that 34,430.00 kWh of electricity are generated using bagasse, which represents 63% of the power the organisation consumes. The remaining 27% was purchased from the national supplier where some come from natural gas sources and other from hydro sources. Furthermore, the organisation reported that over 85 billion litres of water were used in production (20%) and agricultural activities (80%). The major source of water is the Ruaha River, and the organisation has a water use permit, which is audited regularly to verify compliance with the Act (EMA).

Regarding the issue of waste management, the organisation reported that they produced both non-hazardous and hazardous waste. The non-hazardous waste is disposed of in a landfill, and hazardous wastes are incinerated. The organisation

produced 72 tonnes of hazardous and 5,363 tonnes of non-hazardous waste. In addition, effluent water generated by the organisation amounts to 14,000 m^3 and is discharged to Ruaha River.

Regarding the issue of air emission, the organisation reported that it participated in CDP at group level, and the target is to reduce the GHG emissions by 10.7% by 2020. However, the organisation did not measure carbon, but the development of a measuring system was in progress. Furthermore, the organisation reported that their activities had an impact on biodiversity due to the usage of fertilisers and pesticides in growing sugar cane. Therefore, to ensure agriculture is done on a sustainable basis, the organisation adopted the best farming practices as advocated by the South African Sugarcane Research Institute (SASRI). The report indicated that about 15,000 hectares were used for growing sugar cane.

7.3.18 Organisation R

Under the category 'Organisational context', information related to the organisational profile and environmental management policies and systems was reported. Organisation R produces packaging products for protecting food and beverages. The organisation recognises that it is obliged to produce products and services of good quality while at the same time it has to reduce their impact on the environment and consumers. The strategy of the organisation is to reduce waste generation, encourage efficient use of energy, reduce depletion of natural resources and minimise their carbon footprint. The organisation has an environmental management policy, which aims, among others, to –

- comply with the requirements of ISO 14001;
- comply with relevant legislative requirements and standards;
- improve environmental performance;
- conserve water resources; and

- promote environmental awareness.

In addition, the organisation reported that they comply with occupational health and safety legislation, and a core requirement for the business is to provide a safe working environment.

Under the category 'Management performance, policies and systems', a few items were reported. The organisation has an EMS, which is ISO 14001-certified. The organisation is also involved in corporate social investment and 1% of its profit after tax is allocated to social investment. The money is spent in various ways related to the environment, requests from charities, education and health and welfare. In the same way, the organisation also invests in training employees. Managers and employees are given an opportunity to attend various training sessions; however, no information was disclosed on whether training related to the environment was given.

Under the category 'Environment performance', regarding information related to energy consumption, Organisation R reported that the organisation aims to reduce both energy intensity and carbon emission. In 2014, the target of the organisation was to reduce energy intensity by 10% by 2019. Regarding information related to water consumption, the organisation reported that bulk usage of water is for the production of beverage cans and glass manufacturing processes. The organisation reported that a water harvesting system was installed in order to reduce reliance on municipal supply. Other items were not reported.

7.3.19 Organisation S

Under the category of 'Organisational context' organisation S reported compliance with various laws and regulations in its operations. They complied with water quality regulations when treating waste water before discharging it into public sewers. Regarding air quality, the organisation complied with air quality regulations, and

measurement is done annually, which ensures that emissions are within regulatory requirements. In addition, the organisation had an energy conservation programme, and complied with the Pharmacy and Poison Act No. 9 of 1978, which requires all pharmaceutical waste to be handled responsibly. Generally, the organisation has a legal register, which is updated and audited regularly to ensure all legal requirements are met by the organisation.

Under the category of 'Environmental performance' organisation S reported that it takes into consideration issues related to water conservation. The organisation recognises that water is a limited resource; therefore, measures have been put in place to ensure it is preserved. However, no specific measure was disclosed in the report. Likewise, the organisation reported that they compile data related to energy consumption, which assists in calculating carbon emission equivalent, and various measures are in place to reduce carbon emission. Again, no specific measure was disclosed. Regarding waste water, the organisation reported to have a waste treatment plant to treat waste water to the required quality. On the other hand, regarding the issue of waste management, the organisation reported that before disposing, the wastes are separated and properly recorded and stored. The organisation uses authorised waste handlers for transportation as well as disposal sites. The organisation further reported they recycle and re-use non-hazardous waste.

7.3.20 Organisation T

Under the category 'Organisational context', Organisation T reported that they comply with environmental regulations issued by the NEMC. The organisation further reported that they comply with requirements from OSHA and chemical handling procedures as directed by the chief chemist office. The organisation has in place a health and safety policy, an environmental policy and an HIV policy. They also identify and assess environmental risks and other risks related to their activities.

Under the category 'Management performance, policies and systems', Organisation T reported having an EMS since 2013, which is certified by ISO 14001. In addition, the organisation reported that they have two effluent treatment plants: one for waste oil and the other for waste water. Likewise, the organisation has an environmental unit, which is responsible for ensuring the environment is protected and safety of employees are observed by the organisation.

Under the category 'Environmental performance', the organisation reported that they use both electricity and gas as source of energy for their operations. However, no information was given on the total energy consumption for each source. Other items were not reported.

To summarise, as indicated in Table 7.3, the majority of items that have been reported by the organisations operating in the country are related to 'Organisational context' and 'Management performance, policies and systems'. Specifically, in the 'Organisational context' category out of eight items to be reported, six items (75%) have been reported, and the item marked 'Organisational profile' has been reported by all organisations. In the category 'Management performance, policies and systems', 16 items out of 23 (70%) have been reported and two items (i.e. EMS available and CSR) have been highly reported by all organisations. On the other hand, the environmental performance category was not reported adequately by the organisations. Out of 48 items to be reported, 23 items (48%) have been reported, and most of the items were on average reported by two organisations.

Table 7.3: Level of environmental disclosure in Tanzania

S/N	Item	Number of organisations reported the item	Percentage (%)
1	**Organisational context**		

S/N	Item	Number of organisations reported the item	Percentage (%)
1.1	Organisational profile	20	100
1.2	Top management commitment	3	15
1.3	Descriptive overview of the significant environmental risks and potential impact of the organisation	4	20
1.4	Establishment of environmental targets and objectives	2	10
1.5	Environmental compliance obligations	4	20
1.6	Environmental management policies and systems	6	30
1.7	Budget for environmental management	0	0
1.8	Environmental management board and committees	0	0
2	**Management performance, policies and systems**		
2.1	**Management systems and programmes**		
2.1.1	EMS available	13	65
2.1.2	Performance measured against set standards and requirements	0	0
2.1.3	Adherence to internal policies	0	0
2.1.4	Environmental monitoring and audit programmes	2	10

S/N	Item	Number of organisations reported the item	Percentage (%)
2.1.5	Environmental risk management strategies	3	15
2.1.6	Implementation of cleaner production techniques or technologies	0	0
2.1.7	Waste water treatment technologies in place	2	10
2.1.8	Institutional arrangement for environmental management	1	5
2.1.9	Environmental training and awareness programmes	4	20
2.1.10	Environmental grievance handling procedures	1	5
2.1.11	Supporting environmental protection campaigns and activities	4	20
2.1.12	Designing facilities harmonious with the environment	0	0
2.1.13	Prevention and rehabilitation or restoration of damage to the environment	8	40
2.1.14	Conservation of natural resources	2	10
2.2	**Compliance requirement**		
2.2.1	Penalties for non-compliance	1	5

S/N	Item	Number of organisations reported the item	Percentage (%)
2.2.2	Environmental liabilities under applicable laws and regulations	2	10
2.2.3	Litigation about environmental issues	0	0
2.3	**External recognition and activities**		
2.3.1	Environmental achievements and awards received	1	5
2.4	**Financial information**		
2.4.1	Environmental expenditure	3	15
2.4.2	Cost-related environmental fees		
2.4.3	Cost related to environmental incidents	0	0
2.4.4	CSR	17	85
2.4.5	Environmental liabilities	6	30
3	**Environmental performance**		
3.1	**Energy consumption**		
3.1.1	Total energy consumed per year and per unit of output	3	15
3.1.2	Total energy used from renewable sources such as water, wind, biomass and solar power	1	5
3.1.3	Proportion of energy from heavy fuel oil	3	15
3.1.4	Proportion of energy from diesel gas oil	2	10

S/N	Item	Number of organisations reported the item	Percentage (%)
3.1.5	Proportion of energy from premium motor spirit	0	0
3.1.6	Proportion of energy from illuminating kerosene or Jet A-1 fuel	0	0
3.1.7	Proportion of energy from coal	0	0
3.1.8	Proportion of energy from wood	0	0
3.1.9	Proportion of energy from natural gas	1	5
3.1.10	Proportion of equipment (including office equipment and lights) containing power and saving devices	0	0
3.1.11	Disclosure of energy use by facility or by segment level	0	0
3.1.12	Comparison of energy consumption previous year or reduction target level	1	5
3.1.13	Utilising waste materials for energy production	1	5
3.1.14	Disclosing energy saving resulting from product recycling	0	0
3.1.15	Disclosing increased energy efficiency of products	0	0
3.1.16	Research aimed at improving energy efficiency of product	1	5

S/N	Item	Number of organisations reported the item	Percentage (%)
3.1.17	System energy balance analysis	0	0
3.2	**Water consumption**		
3.2.1	Water abstraction, use and discharge permits	2	10
3.2.2	Total water consumption per annum and per unit of output	4	20
3.2.3	Water consumed for various uses such as processing, cooling and sanitation	0	0
3.2.4	Total water abstraction by source	3	15
3.2.5	Water sources significantly affected by withdrawal of water	3	15
3.2.6	Total and percentage of water recycled and/ or re-used	2	10
3.2.7	Total and percentage of water saved through efficiency measures	5	25
3.2.8	Total percentage of water lost through the process	0	0
3.3	**Land use and biodiversity**		
3.3.1	Area of land disturbed	2	10
3.3.2	Area and percentage of land rehabilitated	2	10
3.3.3	Area of land used as buffer zones	0	0

S/N	Item	Number of organisations reported the item	Percentage (%)
3.3.4	Area of land subjected to dryland salinity	2	10
3.3.5	Area of land with significant erosion of topsoil	0	0
3.3.6	Level of habitat impacts and restoration as a result of the operations of the organisation	0	0
3.3.7	Posting rehabilitation bonds (in case of mining project) and rehabilitation plan	4	20
3.4	**Materials and other resources used**		
3.4.1	Quantity of each type of renewable and non-renewable resources used per year and per unit output	0	0
3.4.2	Quantity of toxic or hazardous substances consumed per year and per unit output	0	0
3.4.3	Percentage of inputs saved through efficiency measures	0	0
3.4.4	Sources of materials used and quantity per source	0	0
3.5	**Emission of effluent, waste and other emissions into the air**		

S/N	Item	Number of organisations reported the item	Percentage (%)
3.5.1	Total quantity of GHG emissions in terms of their carbon dioxide (CO_2) equivalent per year and by unit output	7	35
3.5.2	Disclosure of GHG emission by source (e.g. coal, fuel, gas etc.)	0	0
3.5.3	Disclosure of GHG emission by facility or by segment level	0	0
3.5.4	Number of days the facility exceeds the emissions per year	0	0
3.5.5	Comparison of GHG emission with the previous year	1	5
3.5.6	Description of the methodology used to calculate GHG emissions	0	0
3.5.7	Volume of waste water discharges per annum and per unit output	1	0
3.5.8	Quantity of solid waste generated per annum and per unit output	1	0
3.5.9	Type and quantity of hazardous waste generated per year and per unit output	1	0
3.5.10	Volume of hazardous waste stored on and off site	0	0
3.5.11	Internal solid waste handling procedures (collection, sorting and disposal)	0	0

S/N	Item	Number of organisations reported the item	Percentage (%)
3.5.12	Any waste prevention activities in place and their expected benefits	0	0

Note: S/N = serial number

Source: Author's compilation from annual and/or environmental report data

7.4 EXTENT OF ENVIRONMENTAL REPORTING

The extent of the environmental reporting was measured by assessing the quantity of disclosure made, and importance of information reported. Specifically, the quantity of disclosure was measured by counting the number of sentences reported in the annual and environmental reports. The sentences reported were read and categorised in an appropriate category using the EDI that was developed and decision rules as adapted from AbuRaya (2012) (See Appendix B). Since the aim of measuring the quantity of disclosure was to establish the space devoted to environmental reporting by the organisation, each sentence related to the environment was counted regardless of whether the sentence carried the information that had already been reported. Therefore, for each category, the total number of sentences was calculated and added to get the total environmental disclosure made by each organisation. Table 7.4 shows the number of sentences reported by organisations in each category.

Table 7.4: Number of sentences reported in each category by organisations

S/N	Organisation	Organisational context	Management performance, policies and systems	Environmental performance	Total sentences
1	A	6	12	6	24
2	B	12	8	4	24
3	C	30	80	51	161
4	D	17	72	35	124
5	E	22	70	30	122
6	F	3	7	0	10
7	G	3	11	0	14
8	H	2	18	0	20
9	I	3	16	0	19
10	J	1	4	0	5
11	K	1	2	2	5
12	L	1	0	2	3
13	M	2	2	0	4
14	N	8	2	0	10
15	O	2	1	0	3
16	P	1	2	0	3
17	Q	8	17	15	40
18	R	9	16	9	34
19	S	13	10	0	23

S/N	Organisation	Organisational context	Management performance, policies and systems	Environmental performance	Total sentences
20	T	4	4	1	9

Note: S/N = serial number

Source: Author's compilation from annual and environmental report data

It can be observed that Organisation C was leading in reporting environmental information with 161 sentences, followed by Organisations D and E with 124 and 122 sentences respectively. Organisations L, O and P were the least reporters, reporting only three sentences followed by Organisations J and K with four sentences each. As previously discussed (see section 7.3), most of the information disclosed came from 'Organisational context' and 'Management performance, policies and systems' and most of the organisations did not provide any information on environmental performance. Generally, when environmental reporting is assessed industry-wide, it can be observed that organisations from mining and cement are the leaders in reporting. This could be because the cement and mining industry is more regulated by the government and more influenced by international standards than other sectors. For instance, the Mining Act No. 14 of 2010 requires organisations from both mining and cement to post rehabilitation bonds to government to finance the cost of rehabilitation in case they fail to meet their commitment.

Moreover, the importance of information reported was examined using the weighted disclosure index developed in this study. Each item in the index was assigned a weight depending on its importance, and the average weight for each item was calculated. Therefore, for the organisation to be rated high, it was required to report on those items which were rated highly by the experts.

Table 7.5 below shows the scores on the importance of environmental information reported in annual and environmental reports for various organisations operating in Tanzania.

Table 7.5: Importance of environmental information reported by organisations

S/N	Organisation	Organisational context	Management performance, policies and systems	Environmental performance				
				Energy consumption	Water consumption	Land use and biodiversity	Materials and other resources used	Emission of effluent and waste into the air
		Max score 32	Max score 87	Max score 62	Max score 31	Max score 25	Max score 14	Max score 46
1	A	4	24	4	4	4	0	4
2	B	4	7	0	4	4	0	4
3	C	16	19	11	24	8	0	8
4	D	8	23	4	8	0	0	4
5	E	12	27	29	12	4	0	4
6	F	8	23	0	0	0	0	0
7	G	4	19	0	0	0	0	0
8	H	4	19	0	0	0	0	0
9	I	8	11	0	0	0	0	0
10	J	4	7	0	0	0	0	0
11	K	4	15	0	0	0	0	0
12	L	4	0	4	0	0	0	0
13	M	8	3	0	0	0	0	0

S/N	Organisation	Organisational context	Management performance, policies and systems	Environmental performance				
				Energy consumption	Water consumption	Land use and biodiversity	Materials and other resources used	Emission of effluent and waste into the air
		Max score 32	Max score 87	Max score 62	Max score 31	Max score 25	Max score 14	Max score 46
14	N	8	3	0	0	0	0	0
15	O	4	3	0	0	0	0	0
16	P	4	7	0	0	0	0	0
17	Q	8	19	8	12	7	0	12
18	R	8	11	0	4	0	0	0
19	S	12	12	0	0	0	0	0
20	T	16	15	0	0	0	0	0

Note: S/N = Serial number

Source: Author's compilation from annual/environmental report data

As indicated in Table 6.5 the organisations were expected to score a maximum of

- 32 for the 'Organisational context category;
- 87 for 'Management performance, policies and systems;
- 62 for 'Energy consumption';
- 31 for 'Water consumption';
- 25 for 'Land use and biodiversity';
- 14 for 'Material and other resources used'; and
- 46 for 'Emission of effluent, waste and other emissions into the air.

Results showed that under the category 'Organisational context', two organisations (i.e. C and T) scored 16, followed by Organisations E and S who scored 12 each. On the other hand, nine organisations scored 4, implying that they reported only one item out of eight that they were required to report (see Table 6.4).

As indicated in Table 7.3, all organisations reported the item named 'Organisational profile' while two items (i.e. 'Budget for environmental management' and 'Environmental management board and committees') were not reported. Even though these items were not reported, their importance remain, as the items were suggested to be reported because they provide the reader with an understanding of how serious the organisation is about protecting the environment within which it operates. Specifically, the environmental budget allocated for environmental management informs the reader of how much has been set aside for environmental management activities by the organisation. In the same way, the item 'Environmental management board and committees' should tell the reader how the organisation oversees all matters related to the environment within the organisation. The items under this category aim to provide the reader with an understanding of the activities, services and operations of reporting organisations and how the organisation itself is committed to environmental protection issues. However, most of the organisations reported one to two items, leaving the other unreported.

Under the category 'Management performance, policies and systems', Organisations D and E scored 27 followed by Organisations A and F with scores of 24 and 23 respectively. Organisation L scored 0, which implied that no item under this category was reported by the organisation. There were 23 items that were expected to be reported under this category. However, a maximum of seven items (30%) was disclosed by Organisations D and E. As indicated in Table 7.3, two items (i.e. EMS available and CSR) were highly reported by organisations. In particular, 85% of organisations reported the item 'Corporate social responsibility' and 65% of

organisations reported the item 'Environmental management system available'. On the other hand, six out of 23 items under this category were not reported by any organisation. The remaining items were not adequately reported. As discussed earlier (see 6.3.2), the aim of this category was to provide the reader with information related to management effort and capability in managing issues that have an influence on the environmental performance of the organisation. Specifically, management were expected to report whether they had implemented management systems and programmes and how they have complied with various requirements.

Under the category 'Environmental performance', several sub-categories (i.e. 'Energy consumption', 'Water consumption', 'Land use and biodiversity', 'Materials and other resources used' and 'Emission of effluent, waste and other emission into the air') were expected to be reported by most of the organisations. The results showed that under the sub-category 'Energy consumption', only six organisations reported information related to energy consumption. As indicated in Table 7.5, Organisation E scored 29 followed by Organisations C and Q with a score of 11 and 8 respectively. The remaining 14 organisations did not report any item under this category. Regarding water consumption, only seven organisations reported the information, and Organisation C scored 24 out of 31, followed by Organisations E and Q having a score of 12 each. The remaining 13 organisations did not disclose the information. Similarly, under the sub-category 'Land use and biodiversity', only five organisations provided the information and Organisation C was in the lead having a score of 8 followed by Organisation Q with a score of 7 and the rest all had a score of 4. None of the organisations reported any information under the sub-category 'Material and other resources used'. Again, only six organisations disclosed information related to emissions of effluent, waste and other emissions into the air. In this regard, organisation Q was in the lead with a score of 12 followed

by Organisation C with a score of 8. The remaining four organisations scored 4 each.

As can be observed, the items, which appeared to be most important for stakeholders (especially under the category 'Environmental performance'), were left unreported. For instance, under the category 'Energy consumption', it was expected all organisations would report such information because they use various energy sources in their production processes. In particular, the organisations from the cement industry were expected to provide detailed information regarding 'Energy consumption'. The reason behind this was that, in order to produce the final product (cement) the raw mill is heated at high temperature, blended with additives and finally ground into powder (cement) (see Stajanča & Eštoková 2012). The heating source could be natural gas, heavy fuel oil, industrial waste or any other material whose energy content can produce the quantity of heat required for the process. In the same way, organisations from breweries, mining and beverages were expected to provide detailed information on 'Water consumption' as their processes involve the use of high amounts of water. For instance, breweries use about 4 to 7 litres of water to produce 1 litre of beer (IFC 2007b). Therefore, information such as water sources used, water abstraction, use and discharge permits, and total water recycled could have provided the reader with an understanding regarding water consumption and commitment of the organisation on the management of water within its activities.

Furthermore, regarding information on 'Land use and biodiversity', organisations from the mining and cement industries were expected to provide such information as their operations require large areas of land to perform their activities. In particular, the activities of the organisation may involve clearing of vegetation, cultivation of soil, release of chemicals to the land, and even subjecting the land to elevated temperatures and chemical conditions. Such activities may result in disturbing of the

ecosystem, soil pollution, pollution of water bodies; hence, affecting both flora and fauna. Therefore, it was expected that organisations from mining and cement would report such information so that the reader could understand how the organisation is committed to manage land affected by its activities.

On the other hand, the organisations did not report any information related to 'Materials and other resources used'. This item was intended to provide information to the reader to gain an understanding of how the organisation manages materials and other resources used during production or provision of services. However, the challenge was that some organisations might have had a concern regarding business privacy in reporting all resources used. Therefore, the organisations were expected to report only materials, which are sensitive to the environment either due to its scarcity or its toxicity, its hazardousness or a significant potential environmental impact. For instance, organisations dealing with mining activities may be obliged to disclose the type and quantity of chemicals used for mineral extraction and the management of such chemicals. This is because some of the chemicals, such as mercury, are hazardous when used in mineral isolation not only to mine workers but also to the environment surrounding the mining sites. Therefore, this item aimed to provide information on how organisations contribute to the conservation of resources and increase their efficient use of materials and resources.

Lastly, all organisations were expected to provide information on 'Emissions of effluent, waste and other emissions into the air'. Generally, organisations release waste water, solid waste, emissions into the air, hazardous waste, noise or odour in their production processes. It was therefore expected that organisations would report such information. However, only seven organisations provided such information, and only one organisation reported the maximum three items out of 12 items expected to be reported.

Generally, as indicated in the discussion above, the level of importance of environmental information reported was low as most organisations scored below half of the expected score. Only two organisations scored 50% and above, i.e. Organisations C and T with a score 16 (50%) each for the category 'Organisational context', and Organisation C with a score of 18 (77%) for the sub-category 'Water consumption'. When comparing the quantity of environmental reporting and the importance of environmental information reported, it is clear that the quantity of environmental reporting is not representative of the level of importance of information reported by organisations. For instance, despite Organisations C, D, and E showing a large number of sentences, most of the important scores for these organisations were less than half of the expected score. This could be because basic items, which were considered important by the stakeholders, were not disclosed adequately by the organisations.

A lack of guidelines to guide the organisations regarding which item should be reported could be a reason for reporting unimportant information. For instance, Table 7.3 indicates that 65% of organisations had an EMS available. Most of these systems were ISO 14001-certified. Organisations implementing ISO 14001 standards are required to:

- have the commitment of top management and environmental policy, as these two are considered the foundation of an EMS;
- have a plan by identifying significant environmental aspects and setting objectives and targets to minimise the environmental impact;
- implement the plan and ensure that training about the environment is provided to all employees and awareness is created;
- monitor organisational operations and evaluate whether targets set are met or not and take corrective action; and

- review the results of evaluation to see whether the EMS is functioning properly (BSI 2013).

With all these requirements it was expected that a score related to the importance of information reported by these organisations could have been high.

On the other hand, a lack of legal requirements on environmental reporting could be another reason for poor reporting. Organisations disclose environmental information on a voluntary basis therefore giving them the opportunity to choose which item to disclose or not to disclose depending on what they want to achieve. In most cases, organisations tend to choose reporting good news leaving out bad news. As a result, information reported tends to be vague and incomplete (see for example Sen *et al.* 2011:153; Wiseman 1982:60) and does not meet the informational needs of the stakeholders. In the same way, poor supervision of existing regulations may lead to low reporting. For instance, in the extract of environmental information presented earlier (see section 7.3), most organisations reported that they had complied with occupational health and safety regulation. This is because all industries operating in Tanzania are required to comply with the Occupational Health and Safety Act No 5 of 2003 (see URT 2003c). Therefore, penalties are charged for noncompliance.

In some cases, it has been argued (see Pahuja 2009:232) that environmental reporting implies costs; therefore, it is difficult to get such information and the organisation may decide to report such information only when the benefit of releasing the information exceeds the cost of doing so. However, in some cases, this information is available to the organisation at little or no additional cost (Wiseman 1982:56). This is true, for instance in Tanzania where the EMA 2004 requires any project, which is expected to have significant environmental impact before its development, to undertake an EIA. For projects that existed before the issuance of this Act, companies are required to perform an initial environmental audit to evaluate the level of environmental impact and take corrective actions. An

EIA involves identifying the significant environmental impact and devising a measure to mitigate or reduce the impacts. After identifying the significant impacts and the measures to avoid or reduce those impacts, the report is sent to the NEMC for assessment. After the assessment, an EIA certificate is issued that allows the project to be developed. As a result, the environmental information is available to organisations and no additional or little cost is needed for them to report to the public. Likewise, as discussed earlier (see 7.3), most of the organisations have an EMS in their operations and the majority of them are ISO 14001-certified, which implies they already have the information to report.

Generally, the reasons discussed above (i.e. a lack of guidelines, a lack of legal requirements for environmental reporting, and poor supervision of the existing regulations) could be reasons for organisations from the textile, leather, plastic and rubber, chemical and chemical product industries and others not to report environmental information in their annual reports.

In response to the part of research question (how does the information need currently being met or not met by reporting organisation) it can be concluded that the information need is not met. As discussed earlier the majority of the items that were suggested to be reported by stakeholders were not reported by the participating organisations. Therefore, the information reported did not provide the reader with an understanding about environmental performance of the reporting organisation.

Therefore, this study aimed to develop an ERF that will provide guidance to both non-reporting and reporting organisations when reporting their environmental information.

7.5 CHAPTER SUMMARY

In order to examine the extent of environmental reporting in Tanzania, organisations from various industrial sectors, such as mining, cement, pulp and paper, sugar, chemicals and chemical products, pharmaceuticals, beverages, food and water, leather, fertilisers, plastic and rubber, lubricants, tobacco, water supply and sanitary services, health centres and hospitals were contacted to participate in the study. A total of 85 organisations agreed to participate in the study. of these 85 organisations, only 20 organisations were found to report environmental information.

Regarding the quantity of environmental reporting, the results indicated that Organisation C was leading in reporting environmental information with 161 sentences followed by Organisations D and E with 124 and 122 sentences respectively. Organisations L, O and P, however, were the least reporters with only three sentences reported, followed by Organisations J and K with four sentences each. The majority of items that were reported by the organisations came from the categories 'Organisational context' and 'Management performance, policies and systems'. Most of the items under the category 'Environmental performance' were left unreported by the majority of organisations.

The results further showed that the importance of environmental information reported was low as most of the organisations scored below half of the expected score. Furthermore, the results indicated that the quantity of environmental reporting is not representative of its importance. This is because, when comparing the organisations with a high number of sentences reported with their importance scores, the importance scores for these organisations were still less than half of the expected score.

The next chapter presents the development of an ERF for the industrial sector in Tanzania. Various reporting frameworks, laws and regulations related to the environment by the NEMC, international requirements, IAS, IFRS and the disclosure

index that was developed were considered in the process of developing the framework.

CHAPTER 8

ENVIRONMENTAL REPORTING FRAMEWORK

8.1 INTRODUCTION

The aim of the study was to develop an environmental reporting framework (ERF) for the industrial sector in Tanzania. However, prior to the development of the framework, it was necessary to develop a disclosure index to be used in determining the extent of environmental reporting in Tanzania. The disclosure index was developed by consulting different stakeholders (experts) to solicit their opinions on which items to be reported (see Chapter 6). Similarly, an assessment of the extent of environmental reporting was conducted to determine the current level of environmental reporting in Tanzania with respect to the disclosure index that was developed. The findings on the extent of environmental reporting in Tanzania indicated that most of the disclosure items proposed by experts were either not reported or were reported at a lighter weight in annual reports (see Chapter 7). The findings on the extent of environmental reporting in Tanzania called for a framework, which will facilitate environmental reporting in the country.

The framework has been developed after –

- an extensive literature review on environmental reporting (see Chapter 2);
- a review of the current legal framework on environmental issues in Tanzania (see Chapter 3);
- getting the opinions of the key stakeholders on the items which are important for reporting (Chapter 6); and
- an analysis of the current extent of environmental reporting in Tanzania (Chapter 7).

The framework therefore, is intended to provide guidance on environmental reporting to organisations (from the industrial sector) of any size operating in the

country. In particular, it is aimed to facilitate environmental reporting to organisations by providing information which is reliable, relevant and of interest to its stakeholders. In addition, the framework is intended to facilitate credibility, transparency and consistency in reporting environmental information.

It is anticipated that organisations, which use the framework that was developed for environmental reporting, will gain benefits of environmental reporting, as discussed in section 2.2 of this thesis.

This proposed framework requires organisations to report information related to Organisation context, management performance, policies and systems and Environmental performance. similar information is required by integrated reporting framework (see IIRC 2013). With this understanding it will be easier for Tanzanian organisations to integrate environmental reporting component into the integrated reporting framework when required

8.2 TO WHOM DOES THE FRAMEWORK APPLY?

The development of this framework considered the views of environmental experts from various sectors and an empirical analysis of the reporting status of various organisations in Tanzania. The consulted experts were from government departments and agencies, regulatory authorities, research and training institutions, NGOs and the industrial sector in Tanzania. The current status of the environmental reporting was assessed from a representative sample of the industrial sector, such as mining, cement, pulp and paper, sugar, chemicals and chemical products, pharmaceuticals, beverages, food and water, leather, fertilisers, plastic and rubber, lubricants, tobacco, water supply and sanitary services, health centres and hospitals. Therefore, it was intended that the framework will guide organisations (from the industrial sector) operating in Tanzania in environmental reporting. In particular, the framework will aim to guide the first-time reporter, as the majority of the organisations in Tanzania currently do not disclose environmental information in

any of their reports. This framework will provide guidance to environmental reporting by organisations in terms of which items to report and how to report. Furthermore, the framework may also provide guidance to organisations which already disclose environmental information in their reports. Environmental reports prepared using the proposed framework will allow stakeholders to compare and evaluate environmental performance between organisations or environmental performance of an organisation over time because the framework supports credible, transparent and consistent disclosure of information.

8.3 PRINCIPLE OF REPORTING ENVIRONMENTAL INFORMATION

In order to ensure that the environmental information reported represents a faithful, true and fair account of their environmental impact, organisations are required to apply the following principles when collecting and reporting environmental information. These principles are important in attaining transparency (World Business Council for Sustainable Development [WBCSD] & World Resource Institute [WRI] 2004:7).

Accuracy: this principle intends to minimise uncertainties where applicable and to ensure that the reported information is sufficient and detailed. Data should be accurate to enable users to evaluate the environmental performance of the organisation and make reasonable decisions (GRI 2013b:18; WBCSD & WRI 2004:9).

Relevancy: this principle ensures that the environmental information reported meets the decision-making needs of both internal and external users of an organisation. In particular, the principle ensures the data collected and reported by organisations, reflects its environmental impacts, and at the same time serve the decision-making needs of its users. Therefore, for the information to be of relevance and to facilitate the decision-making process, it should be made available to users in time (WBCSD & WRI 2004:8).

Comparability: this principle ensures that the environmental information is presented in a manner, which allows comparison across organisations or within organisations over time. Specifically, the principle requires organisations to choose, assemble and report the information consistently (i.e. applying the same accounting treatment from time to time). Therefore, users should be able to compare the environmental performance of the organisation against its past performance and if possible, against the environmental performance of other organisations (GRI 2013b:18).

Clarity: this principle requires the organisation to present environmental information in an understandable manner. This implies that users must understand the information provided in a context of the decision being made. In this regard, environmental reports should be prepared taking into consideration the abilities and knowledge of the users (GRI 2013b:18).

Reliability: environmental information reported is reliable if it represents what it purports to represent. In this regard, the information is considered to be reliable if it is verifiable, representational, faithful and neutral. The principle requires information to be reported in such a way that it can be examined to ensure the truthfulness of its content (GRI 2013b:18).

Completeness: this principle requires organisations to report and quantify all sources of environmental impacts within selected reporting boundaries and to justify any exclusion made. The principle requires organisations to report material aspects and their boundaries sufficiently to reflect significant environmental impacts and to facilitate users to examine the performance of the organisation in the reporting period (GRI 2013b:17; WBCSD & WRI 2004:8).

8.4 INCORPORATION OF RESULTS AND FINDINGS

The results from Chapter 6 and Chapter 7 of this study formed a basis for development of the ERF for the industrial sector in Tanzania. The environmental disclosure index (EDI) developed in Chapter 6 gives out the overview of what stakeholders expect to see in environmental reports prepared by the organisations operating in Tanzania. Specifically, the EDI indicate that stakeholders require to see a variety of information ranging from general information to more specific information. Stakeholders require the organisation to provide information on organisational context as this information gives the reader an understanding of the activities, services and operations of reporting organisations and how the organisation itself is committed to environmental protection issues. In the same way, the stakeholders require the organisation to report information related to management performance, policies and systems. As such, information provides the reader information related to management efforts and capability in managing issues that have influence in the environmental performance of the organisation. Lastly, stakeholders require organisations to report information related to environmental performance. This information enables the reader to understand specifically how the operations of the organisation have been improved to reduce its impact on the environment. In terms of environmental performance, energy consumption, water consumption, waste management and GHG emission are some of examples that could be reported.

Moreover, the result for the extent of environmental reporting in Tanzania (Chapter 7) indicates that most of the items that have been reported by the organisations operating in the country come from the category of the 'Organisational context' and 'Management performance, policies and system'. The majority of the items that were suggested to be reported by stakeholders were not reported by the participating organisations. It can be concluded that, the information reported by the

organisations operating in the country did not provide the reader with an understanding about environmental performance of the reporting organisation. Therefore, this framework aims to bridge this gap by providing guide on the steps to be followed when preparing environmental reports and the content to be included in reports (as per stakeholders need). Figure 8.1 present a schematic illustration for environmental reporting framework.

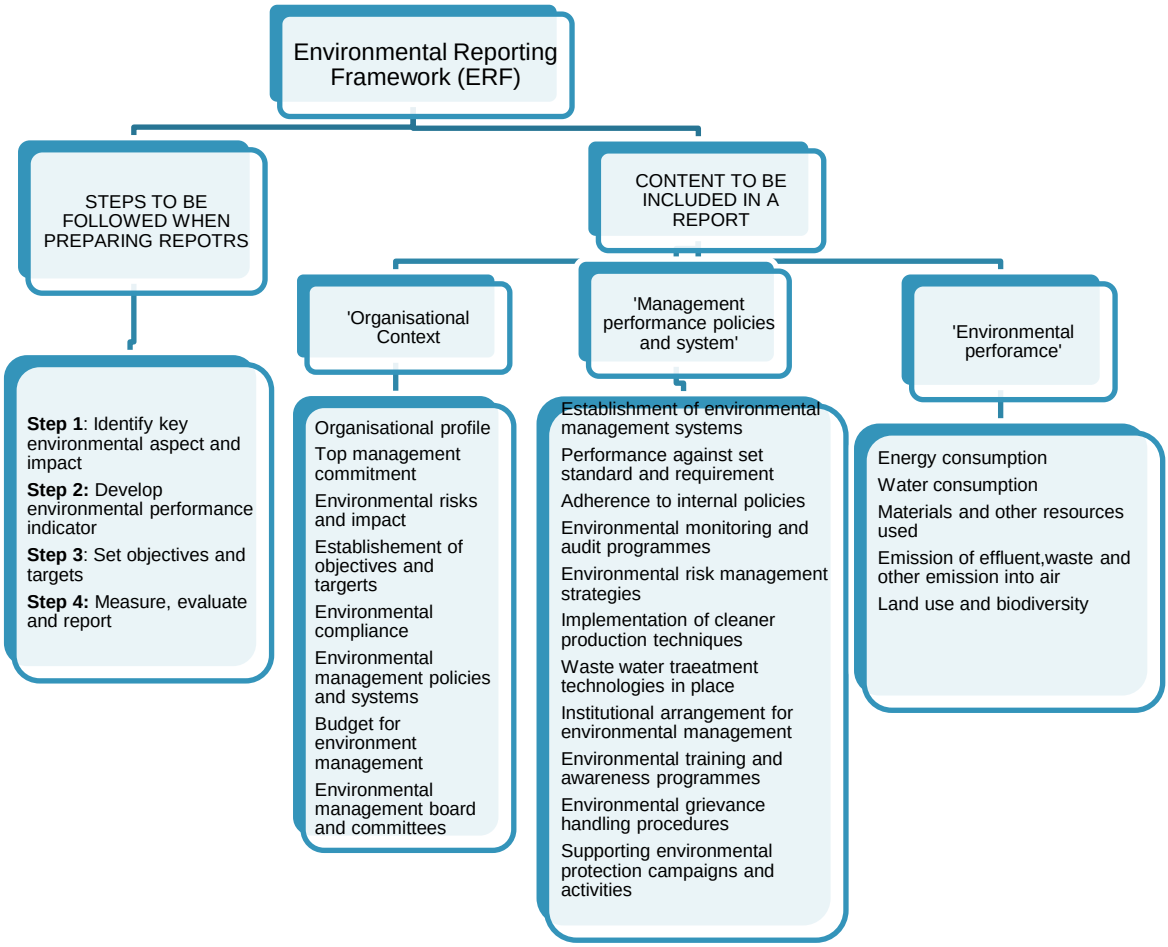


Figure 8.1: Schematic illustration for environmental reporting framework

Source: Author's compilation

8.5 STEPS IN PREPARING ENVIRONMENTAL REPORTS

All organisations – regardless of whether it is private, public, industrial, commercial, small or large – have environmental impact. However, the level of impact differs from organisation to organisation depending on the nature of their activities. In the same way organisations differ in terms of organisational requirements, obligations to stakeholders and environmental obligations. It is therefore expected that the content of the environmental report may vary among organisations. However, the approach used for environmental reporting may be the same regardless of the level of environmental obligations and type or size of stakeholders. Therefore, for ease of preparation of environmental reports, it is important that the ERF provides among other things the steps to be followed when preparing environmental reports.

In determining which steps should be followed by the industrial sector when preparing environmental reports, various existing ERFs were reviewed (see section 2.7 of this thesis). In particular, the steps used in this framework were based on the experience borrowed from a framework for public environmental reporting in Australia (Natural heritage trust 2000) in preparing public environmental reports. The steps are described in the paragraphs below.

Step 1: Identify key environmental aspects and impacts

Step 2: Develop environmental performance indicators

Step 3: Set objectives and targets

Step 4: Measure, evaluate and report.

8.5.1 Identifying key environmental aspects and impacts

An environmental aspect is defined as “an element of organisation’s activities, product or services that has or may have impact on the environment” (Bureau of Indian Standard 2003:1).

Environmental impact is defined as “any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation’s activities, product or services” (Bureau of Indian Standard 2003:1).

In identifying the environmental aspects and impacts, organisations are required to understand which environmental issues are relevant to their business and the extent of the impact this has to the environment. Organisations are expected to be familiar with not only the impact but also its source, i.e. whether from products, services or activities (Natural Heritage Trust 2000:15). Therefore, organisations are required to identify the environmental aspects over which the organisation has influence and control. When identifying the environmental aspects and impacts the organisation should consider issues such as:

- waste and emission into the environment;
- use of raw material and natural resources;
- impact on air, water and land; and
- legal requirements and other codes and guidelines (Natural Heritage Trust 2000:14).

Potential environmental impacts may include energy consumption, water consumption, emissions into the air, use of material or resources, water discharges, noise impact, odour, waste management, contamination of land, accidental releases of hazardous chemicals and others.

For illustration purposes, consider a cement industry. The activities of the cement industry involve quarrying of raw material, reducing size of raw material, preheating of raw material, clinker formation and milling of clinker, mixing with additives and storage and packaging (see section 3.4.4 of this thesis for details). Based on the activities described in cement production, the environmental aspects and environmental impact can be derived, and are summarised in Table 8.1.

Table 8.1: Some environmental aspects and impacts related to the cement industry

Activities	Environmental aspect	Environmental impact
Site development	Preparing land for quarrying	• Biodiversity degradation and loss • Fuel consumption
Quarrying of raw materials (limestone and clay)	Drilling, blasting and excavating	• Land degradation • Dust emission (air pollution) • Noise pollution • Fuel consumption
Raw material transport and storage	Loading, hauling and storing	• Dust emission (air pollution) • Fuel consumption
Size reduction	Crushing of raw material and grinding of crushed raw material and screening	• Dust emission (air pollution) • Noise pollution • Energy consumption
Raw milling	Mixing and blending of raw material to obtain correct chemical configuration	• Dust emission • Energy consumption
Preheating	Preheating of raw materials	• Gas emission nitrogen oxides (NOx)and sulphur oxides (SOx)) • Energy consumption
Clinker formation	Heating of raw materials at high temperature to form clinker, and cooling of clinker	• Heat emission • Dust emission • Solid waste • Gas emissions nitrogen oxides (NOx) and sulphur oxides SOx) • GHG emission carbon dioxide (CO_2) • Energy consumption • Water consumption
Milling, storage and packaging	Mixing clinker and gypsum Storage and packaging	• Dust emission • Energy consumption

Sources: (Stajanča & Eštoková 2012; Zainudeen & Jeyamathan 2008)

After the identification of environmental aspects together with their impacts, organisations should evaluate the significance of each impact to determine the

priorities of the organisation for reporting the impact (Natural Heritage Trust 2000:15).

8.5.2 Develop an environmental performance indicator

After identification of the environmental aspects and impacts that best describe the performance of the organisation, the next step is to develop an environmental performance indicator. 'Environmental performance indicator' refers to "parameters selected to track and quantify environmental performance of an organisation"(GovHK, 2015:19).

These indicators are used by an organisation to monitor and evaluate the success of the environmental performance of an organisation. The indicators assist stakeholders in understanding the environmental status of the organisation. In particular, environmental performance indicators assist in reducing the data set related to the environmental performance of the organisation over time into understandable trends. Likewise, indicators provide a basis to make comparisons between different periods of measurement within organisations, as well as between organisations (Natural Heritage Trust 2000:17).

An environmental performance indicator could be developed to evaluate either the management performance or operational performance of an organisation (Natural Heritage Trust 2000:16; Bureau of Indian Standard 2003:2). Management performance indicators show the effort made by management to influence the environmental performance by the organisation. These indicators focus on describing the actions taken by management to minimise the environmental impact arising from the operations of the organisation (Bureau of Indian Standard 2003:2). For instance, the organisation may develop indicators to evaluate the success of an organisation when implementing management systems, policies and programmes, compliance with existing laws and regulations, and implementing programmes related to environmental issues to support the local community.

Operational performance, on the other hand, provides information about environmental performance of the operations of an organisation. operational performance indicators trace the information related to environmental impacts occurring due to the operations of an organisation directly (Bureau of Indian Standard 2003:2; Natural Heritage Trust 2000:17). For instance, the organisation may develop indicators to evaluate the success of the organisation in preventing pollution, such as water, air and land pollution. In the same way, the organisation may develop indicators to evaluate how they have minimised resource consumption, such as material, water and energy consumption.

Therefore, when developing environmental performance indicators, organisations are advised to classify the indicators as either management performance indicators or operational performance indicators. The following examples of environmental performance indicators are based on the illustration from the description of the cement production process (see section 3.4.4 of this thesis for details), the environmental aspects and the environmental impact of cement production (see Table 8.1 and literature review).

Table 8.2 Some of environmental performance indicators for the cement industry

S/N	Environmental performance indicators
1	**Management performance indicators**
	• Number of pollution prevention initiatives implemented • Number of employees participating in environmental programme (e.g. recycling, suggestions, clean-up initiatives or others) • Number of employees receiving environmental training • Research and development fund applied to project with environmental significance • Savings achieved through reductions in resource usage, waste recycling and prevention of pollution

S/N	Environmental performance indicators
	• Number of environmental awards received • Amount spent on improving technology • Amount spent to support community environmental programme • Degree of compliance with regulations • Number and frequency of environmental audits • Number of audits planned versus completed • Number of environmental educational programmes or materials provided for the community • Resources applied to support community environmental programme
2	**Operational performance indicators**
	• Total energy consumed per year (MJ) or per unit of output (MJ per ton cement) • Total energy consumed by type (i.e. electricity consumption (kWh per ton cement) and thermal energy consumption (MJ per ton cement) • Total fuel consumed (MJ, MJ per ton) • Total fuel consumed by type (i.e. alternative fuel (MJ) and fossil fuel (MJ per ton) • Total energy saved due to energy conservation programmes (MJ) • Emissions of particulates matter per year (kg) and per unit of product (kg per ton cement) • Emission of sulphur dioxide (SO_2) per year (kg) per unit of product (kg per ton cement) • Emission of nitrogen oxides (NO_x) per year (kg) per unit of product (kg per ton cement) • Emission of carbon dioxide (CO_2) per year (kg) per unit of product (kg per ton cement) • Total amount of waste generated (ton per ton cement) • Amount waste recycled (ton per ton cement) • Amount of waste land filled (ton per ton cement) • Total raw material used per year (ton) or per unit of product (ton per ton cement)

S/N	Environmental performance indicators
	• Amount of alternative raw material used per year (ton) or per unit of product (ton per ton cement) • Amount of raw material reused per year (ton) per unit of product (ton per ton cement)

Note: S/N = serial number

Sources:(Bureau of Indian Standard 2003; Fiksel, Spitzley & Brunetti 2002)

8.5.3 Set objectives and targets

After identifying the environmental performance indicators for organisations, the next step is to set the environmental objectives and targets. An objective can be defined as "an environmental goal that an organisation sets itself to achieve and it should be quantified where practicable" (Natural Heritage Trust 2000:19).

A target can be defined as "a detailed performance requirement, quantified where practicable, applicable to the organisation or parts thereof that needs to be set and met to achieve the objectives" (Natural Heritage Trust 2000:19)

Setting out the objectives and targets help organisations to achieve the following:

- increase the credibility of the report produced;
- declare publicly the environmental commitment and show how seriously the organisation is in achieving its commitment; and
- compare and monitor the performance easily (Natural Heritage Trust 2000:19).

When setting the objectives and targets the following factors should be considered:

- environmental policy and organisational requirements;
- significant environmental impacts;
- environmental compliance requirements;
- stakeholder, financial, operational and business requirements;
- environmental performance (current and past);

- industry sector requirements and agreements; and
- recognised codes, standards and best management practices (Natural Heritage Trust 2000:18).

Therefore, when developing their objectives and targets, organisations are required to identify and take into consideration those factors that are most significant to their operations. For instance, the cement companies operating in Tanzania are required to comply with the Environmental Management (Air Quality Standards) Regulations, 2007 (URT 2007). It is therefore expected that the objectives and targets set against air emission would take into consideration the current Air Quality Standards Regulations.

Generally, when setting objectives and targets, the objectives should be specific and targets should be measurable. Targets should be in line with the relevant policy and should reflect the objectives established (Natural Heritage Trust 2000:19). Therefore, as a general rule the targets should be:

- in line with environmental policy;
- specific in terms of the timeline and set on an annual basis;
- measurable, attainable, relevant and traceable; and
- set on a long-term and short-term basis (Natural Heritage Trust 2000:19).

Table 8.3 shows some of environmental objectives and targets that can be developed by the cement industry.

Table 8.3: Some environmental objectives and targets for the cement industry

Objectives	Targets (long term)	Targets (short term)
Reduction of carbon dioxide (CO_2) emission	Reduce by 40% carbon dioxide (CO_2) emission per ton of cement by 2030 compared to 1990 levels	Year 1: reduction 1% Year 2: reduction 2% Year 3: reduction 3%

Objectives	Targets (long term)	Targets (short term)
		Year 20: reduction 20% Year 40: reduction 40%
Reduction of dust emission	Reduce by 50% dust emission per ton of clinker by 2020 compared to 2010 levels	Year 1: reduction 5% Year 2: reduction 10% Year 3: reduction 15% Year 4: reduction 20% Year 5: reduction 25% Year 10: reduction 50%
Reduction of nitrogen oxides (NO_x) emission	Reduce by 25% nitrogen oxides (NO_x) emission per ton of clinker by 2020 compared to 2010 levels	Year 1: reduction 2.5% Year 2: reduction 5% Year 3: reduction 7.5% Year 4: reduction 10% Year 5: reduction 12.5% Year 10: reduction 25%
Reduction of sulphur dioxide (SO_2) emission	Reduce by 30% sulphur dioxide (SO_2) emission per ton of clinker compared by 2020 compared to 2010 levels	Year 1: reduction 3% Year 2: reduction 6% Year 3: reduction 9% Year 4: reduction 12% Year 5: reduction 15% Year 10: reduction 30%
Use of non-fossil fuel	Use 50% of non-fossil fuel in cement production by 2020 compared to 2010 levels	Year1: use 5% Year 2: use 10% Year 3: use 15% Year 4: use 20% Year 5: use 25% Year 10: use 50%
Reduce freshwater withdrawal	Reduce by 15% freshwater withdrawal in cement production by 2030 compared to 2010 levels	Year 1: reduce 0.75% Year 2: reduce 1.5% Year 3: reduce 2.25%

Objectives	Targets (long term)	Targets (short term)
		Year 4: reduce 3% Year 5: reduce 3.75% Year 10: reduce 7.5% Year 20: reduce 15%
Reduction of energy consumption	Reduce energy consumption by 20% in cement production by 2030 compared to 2010 levels	Year 1: reduce 1% Year 2: reduce 2% Year 3: reduce 3% Year 4: reduce 4% Year 5: reduce 5% Year 10: reduce 10% Year 20: reduce 20%

Source: (GovHK 2015)

8.5.4 Measure, evaluate and report

After setting the objectives and targets, the next step is to measure, evaluate and report the information. Organisations are required to collect, collate and analyse data in a meaningful way. Therefore, organisations are requested to develop an appropriate mechanism for monitoring and collecting data related to the performance indicator identified. The collected data need to be organised in appropriate and meaningful information for reporting. In particular, data should be collected over a specified period, for instance annually. The collected data should be analysed and discussed with respect to the set targets, environmental compliance requirements and in comparison, to the previous year's performance. The organisation may use any available data processing and analysis software for processing (Natural Heritage Trust 2000).

8.6 CONTENT TO BE INCLUDED IN ENVIRONMENTAL REPORT

This section provides guidance on the content that should be included when preparing environmental reports and how the report can be organised. In particular,

it takes into consideration the suggestions that were provided by stakeholders during the process of constructing the EDI (see Chapter 6). Therefore, organisations are required to report and classify the environmental information into three categories, i.e. 'Organisational context', 'Management performance, policies and systems' and 'Environmental performance'.

8.6.1 Organisational context

The Organisational context provides information about general organisational activities and management. All organisations regardless of the size or the type of industry in which they operate are required to report information under this category, because it gives the reader an understanding of the activities, services and operations of reporting organisations and the way the organisation itself is committed to environmental protection issues. Information such as the organisational profile helps the reader to understand the activities of the organisation. Information such as top management commitment to the environment, environmental budget and environmental management board and committee helps the reader to understand the commitment made by the organisation to protect the environment within which it operates. Table 8.4 provides a list of items that are required to be reported by organisations under this category. In case the organisation has no item or information to be reported, it should be recorded and indicate that the information on that particular item is not available (or is not applicable).

Table 8.4 Items to be reported by organisation under the category 'Organisational context'

S/N	Item	Information to be reported under the item
1	Organisational profile	• Name of organisation • Major business, services and products offered by organisation • Mission and vision of the organisation • Relevant licences and permits held by the organisation • Date the organisation started its operations • Nature of ownership and legal form of the organisation • Size of the organisation (for instance turnover and assets)
2	Top management commitment to environment	• Statement by CEO or the chairperson of the board of directors, or any senior member of the management team about the overall commitment of the organisation to responsible care for the environment (this should include information on environmental policy and commitment to continue improvement and prevention of pollution). Note: For government institutions, the commitment should come from the minister responsible for the institutions
3	Environmental management policies and systems	• Environmental policy specific to organisational activities • Also include health and safety policies
4	A descriptive overview of the significant environmental risks and potential impacts of the organisation	• Provide a description of the operations and processes of the organisation and identify what comes in and what goes out during each stage of production • Identify the characteristics and/or potential risk of waste generated at each stage described above • Significant environmental impacts of the product, services and activities of the organisation
5	Establishment of the environmental objectives and targets	• Objectives and targets set by an organisation in order to achieve environmental goal

S/N	Item	Information to be reported under the item
		• Comparison of the set targets with national standards or international standards in case national standard is not available
6	Environmental compliance obligations	• Compliance regulations applicable to the organisation Note: The discussion should not be restricted to regulation set by the NEMC but also include other regulations which are cross-cutting from another sector • The level of compliance of the regulations achieved by the organisation
7	Budget for environmental management	• Total environmental budget expressed as a percentage of the organisational budget Note: The budget should be itemised for each environmental management activity or the objectives
8	Environmental management board and committee	• Availability of environmental management board and committee • The seniority of chair of the environmental committee and how this committee reports to the board

Note: S/N = serial number

Source: Author's compilation

8.6.2 Management performance, policies and systems

The 'Management performance, policies and systems' category aims to provide the reader with information related to the management effort and capability in managing issues (such as policies, planning, people, practices and procedures) that have an influence on the environmental performance of the organisation. The environmental performance of the organisation may be influenced by the effort and decisions made by the management. Hence, management may be interested in evaluating itself on the way they have succeeded in implementing environmental policies and programmes throughout the organisation, or how effective the management system is in terms of complying with requirements or expectations, and/or how they have succeeded in implementing their programme related to environmental issues in the

local community. Likewise, management may be interested to show the effort they have made in managing issues such as training, efficient utilisation and allocation of resources and product development (Natural Heritage Trust 2000; Bureau of Indian Standard 2003).

The category 'Management performance, policies and systems' has been divided into four sub-categories, namely 'Management systems and programmes', 'Compliance requirements', 'External recognition' and 'Financial information'. The sub-category 'Management systems and programmes' provides information to the reader on how the organisation has managed to implement various systems and programmes to influence the environmental performance of the organisation. 'Compliance requirements' aim to provide information to the reader on how organisations comply with various requirements. In particular, this sub-category demonstrates the openness of organisations regarding compliance issues to the reader. The sub-category 'External recognition and activities' aims to provide information on the awards received and achievements achieved in a reporting period. This sub-category assists in promoting employee commitment and stakeholder support. Likewise, it adds credibility to some claims made by the organisation. The 'Financial information' sub-category aims to provide information about spending related to environmental issues by the organisation. This information is necessary because various stakeholders, such as insurers, employees and investors, need such information in order to examine the liabilities, competitiveness, risks and future profitability of the organisation (Cormier *et al*. 2005).

All organisations are required to provide information under this category as this will enable the reader to understand the capability of and effort by management of the organisation in influencing the environmental performance of the organisation. Table 8.5 lists the items that are required to be reported under the category

'Management performance, policies and systems'. In case the organisation has no item or information to be reported then it should be recorded and indicated that no information is available (or is not applicable).

Table 8.5 Items required to be reported under the category 'Management performance, policies and systems'

S/N	Item	Information to be reported under the item
Management systems and programmes		
1	EMS available	• Availability of adopted EMS in organisation e.g. ISO 14001 or any system developed within organisation
2	Performance measured against set standards and requirements	• Performance achieved by organisation in implementing all environment-related activities • Compare the performance measured against set standards and requirements
3	Adherence to internal policies	• The extent to which an organisation has managed to implement its activities as per its internal policies
4	Environmental monitoring and audit programme	• Availability of environment monitoring and audit programme. • Availability of existing results of environmental monitoring and audit
5	Environmental risk management strategies	• Strategies set by an organisation to identify, assess and prioritise environmental risk • Measure taken in case of any environmental risk • Availability of emergency preparedness of an organisation (i.e. steps that the organisation takes to ensure employees and community are safe before and after the emergency)
6	Implementation of clean production techniques or technologies	• Implementation of cleaner production plans by the organisation (i.e. implemented a technology to minimise emissions and waste and maximise the output)
7	Institutional arrangement for environmental management	• Availability of department or office that deals with environmental management.

S/N	Item	Information to be reported under the item
		Note: This should include the number of staff with environmental responsibilities and their qualifications • State to which office or department members dealing with environmental management are attached (In case no specific department or office)
8	Environmental training and awareness programmes	• Availability of environmental training and awareness programme • Percentage of employees who received training on environmental management awareness • Availability of outreach programme on environmental issues
9	Environmental grievance handling procedures	• Availability of proper environmental grievance procedures to handle complaints
10	Supporting environmental protection campaigns and activities	• Involvement of the organisation in supporting environmental protection and/or activities
11	Designing facilities harmonious with the environment	• Provide information on whether organisation considers facilities that are acceptable and environment-friendly when selecting, acquiring or designing, or not
12	Prevention and rehabilitation or restoration of damage to the environment	• Availability of strategies for prevention of environmental damages or restoration and rehabilitation of environment damage due to activities of the organisation (for instance extraction of natural resources)
13	Conservation of natural resources	• Information on efficient use of natural resources (e.g. recycling glass, water and paper)
Compliance requirements		
1	Penalties for non-compliance	• Information on any penalties, sanctions, fines incurred by an organisation for non-compliance with regulations issued by central government, local government or any other applicable regulations and conventions
2	Environmental liabilities under applicable laws and regulations	• Information on any liabilities related to the organisation required by laws and regulations.

S/N	Item	Information to be reported under the item
		For instance, liabilities arising from contaminated land, water or air
3	Litigation about environmental issues	• Report any existing legal proceedings for violating environmental laws
External recognition and activities		
1	Environmental achievement and awards received	• Information on any environmental achievement and awards received. For instance, award for environmental protection, award for energy conservation or award for GHG emission control.
Financial information		
1	Environmental expenditure	• Information on any cost incurred by organisation in managing the environment. For instance, cost for waste disposal, cost associated with clean production measures, purchase of pollution control equipment, cost incurred for training employees about environment, cost for treatment and disposal of hazardous waste, cost incurred for rehabilitating damaged environment
2	Environmental fees	• Information on any fees paid related to environmental licences, taxes or charges as condition for operations
3	Environmental incidents and their cost	• Information on the cost incurred in relation to environmental incidents, such as oil spillage or waste water leakage. • Information on the measures that have been taken to avoid recurrence of the incidents
4	CSR	• Information on the cost incurred by organisations related to CSR

Note: S/N = Serial number

Source: Author's compilation

8.6.3 Environmental performance

Environmental performance sometimes referred to as 'Operational performance' aims to provide information on the performance of operations of an organisation

(Natural Heritage Trust 2000:31). The operations of the organisation comprise activities that aim at providing products or services to the customers. The operations of organisations may be categorised based on the inputs, processes and outputs from its physical facilities and equipment (Bureau of Indian Standard 2003:24). Therefore, environmental performance may be reported by looking at the operations and its impact of the organisation related to inputs (such as materials, water and energy) and outputs (such as emissions into the air, waste and effluent). Moreover, it may include the impact of the organisation related to biodiversity and land use, products and service and transport (Natural Heritage Trust 2000:31). Unlike the 'Organisational context' and 'Management performance, policies and system' categories according to which organisations are expected to report all items proposed, under this category, only significant environmental aspects and impacts of the organisation are expected to be reported.

Therefore, under the environmental performance category, the following sub-categories should be reported:

- energy consumption;
- water consumption;
- materials and other resources used;
- emissions of effluent, waste and other emissions into the air; and
- land use and biodiversity.

8.6.3.1 Energy consumption

This sub-category provides information to the reader on how organisations strive to balance the choice of energy that has a low impact on the environment. Energy use or consumption has implications in the form of climate change, depletion of non-renewable resources and air pollution (Natural Heritage Trust 2000:31). Different sources of energy have diverse impacts on the environment, and it is therefore important to report energy consumption by input type (Natural Heritage Trust

2000:31). For instance, the consumption of non-renewable fuel contributes more GHG emissions than renewable fuel. In addition, the energy consumption has a direct effect on operational cost, which could lead to an increase in fluctuation in energy supply and prices (GRI 2013a:89). Therefore, measuring and monitoring energy use could assist an organisation to detect areas for improvement in achieving energy efficiency as well as to demonstrate cost savings through the implementation of energy-saving programmes. Table 8.6 provides a list of items that should be reported under the energy consumption sub-category.

Table 8.6 List of items to be reported under energy consumption sub-category

S/N	Item	Information to be reported under the item
1	Energy consumed	• Total energy consumed per year and per unit of output • Proportion of energy sourced from renewable sources, such as water, wind, biomass, solar power and hydroelectric power • Proportion of energy sourced from non-renewable sources such as heavy fuel oil, coal, wood and natural gas
2	Energy use by facility or segment	• Energy used by facility or used by different sections (segments) in the organisation
3	Reduction in energy consumed	• Amount of energy saving achieved as a result of conservation and efficiency initiatives • Types of energy included in achieving the energy saving. e.g. fuel, electricity and heating
4	Equipment containing power and saving devices	• Proportion of equipment (including office equipment and lights) containing power and saving devices
5	System energy balance analysis	• Amount of energy dissipated (i.e. what comes in less what is consumed)

Note: S/N = Serial number

Source: Author's compilation

8.6.3.2 Water consumption

This sub-category intends to provide information about the commitment of the organisation to the management of water within its activities. Normally, water and its use can have an effect on the operations of the organisation. For instance, an organisation that requires a large quantity of water in its operations and/or which operates in an area where water is scarce, could find itself at risk of not receiving enough water from supplies or there might be an increase in the cost of water (GRI 2013a:97). Furthermore, the possibility of conflict might arise between the organisation and the surrounding local community due to competition for water, which might negatively affect the relationship between the organisation and its stakeholders (DEFRA 2013:44).

On the other hand, organisations using abstracted water could affect the environment by lowering the water table leading to a reduction in the volume of water available for use or creating a disturbance to the ecosystem (GRI 2013a:98). Good management of water could provide an opportunity for an organisation to demonstrate leadership, build a good relationship with the community, improve brand reputation, and reduce costs (GRI 2013a:97). Organisations have a role to play to ensure that water resources meet current and future demands by monitoring their water use. Therefore, it is important for the organisation to set water consumption strategies for the purpose of environmental management as well as cost savings. Table 8.7 provides a list of items that should be reported under the water consumption sub-category.

Table 8.7 List of items to be reported under 'Water consumption' sub-category

S/N	Item	Information to be reported under the item
1.	Permits for water abstraction and use	• Availability of permits to abstract and use water

S/N	Item	Information to be reported under the item
2	Water abstracted	• Total quantity of water abstracted by source, e.g. lake, river and groundwater • Information on water sources, which are significantly affected by withdrawal of water
3	Water consumed	• Total water consumed per annum and per unit of output • Quantity of water consumed for various uses, such as processing, cooling and sanitation
4	Water saved	• Total quantity and percentage of water saved through efficient measures
5	Water recycled or re-used	• Total quantity and percentage of water recycled and/or re-used
6	Water lost	• Percentage of water lost through the process

Note: S/N = Serial number

Source: Author's compilation

8.6.3.3 Materials and other resources used

This sub-category intends to provide information to the reader to understand how the organisation manages materials and other resources used during production or provision of services. However, there is a challenge that some organisations may have a concern regarding business privacy in reporting all resources used (Natural Heritage Trust 2000:34). Therefore, the organisation is expected to report only materials that are sensitive to the environment either due to its scarcity, toxicity, hazardousness or due to its potential significant environmental impact (Natural Heritage Trust 2000:34). For instance, an organisation dealing with mining activities may be obliged to disclose the type and quantity of chemicals used for mineral extraction and the management of such chemicals. This is because some chemicals, such as mercury, used in mineral isolation are hazardous not only to mine workers but also the environment surrounding the mining sites.

Therefore, this sub-category intends to provide information on how organisations contribute to the conservation of the resources and increase their efficient use of materials and resources. Furthermore, the sub-category intends to provide information to those interested in the financial performance of organisations regarding how the cost of material is monitored as material consumption relates to the overall cost of production (GRI 2013a:86). Likewise, the information on the ability of an organisation to use recycled materials could be provided. The use of recycled materials may contribute to lowering the cost of operations and dependence on natural resources. Table 8.8 provides a list of items that should be reported under the sub-category 'Materials and other resources used'.

Table 8.8 List of items that should be reported under the sub-category 'Materials and other resources used'

S/N	Item	Information to be reported under the item
1	Renewable and non-renewable resources used for production	• Quantity of each type of renewable and non-renewable resources used per year and per unit output
2	Toxic or hazardous substances used	• Quantity of toxic or hazardous substances consumed per year and per unit of output
3	Recycled material	• Percentage of recycled input material used to produce products
4	Source of material	• Sources of materials used and quantity per source • Materials purchased locally versus those imported

S/N =Serial number

Source: Author's compilation

Note: quantity of renewable and non-renewable resources can be calculated by considering the following parameters;

- *raw materials used to manufacture a product;*
- *materials that are used to support manufacturing processes, e.g. lubricants*
- *components and materials other than raw materials that form part of the final product, such as semi-manufactured goods or parts; and*
- *material used for packaging, such as plastics, paper and cardboard.*

For each material, identify whether it was derived from renewable or non-renewable sources, and whether it was purchased locally or imported

8.6.3.4 Emission of effluent, waste and other emissions into the air

This sub-category seeks to provide information to the reader on how an organisation manages issues related to the emission of effluent, waste and other emissions into the air. These issues are supposed to be reported by the organisations as they pose a threat to human health and the natural environment. For instance, emissions into the air have an adverse effect on climate change, quality of the air humans breathe, and the ecosystem in general (GRI 2013a:107). Some chemicals, when released to land, bind with soil and contaminate it for a long time and so destroy soil quality. In the same way chemicals released to water sources could contaminate water supplies, while acids could concentrate in both soil and water bodies, which could have adverse effects on the flora and fauna (DEFRA 2013:57). Moreover, the excessive discharge of organic waste in water bodies could cause damage to life in coastal and marine waters, rivers and lakes. Disruption of aquatic habitats and significant air pollution could result when volatile organic compound is emitted into environment (DEFRA 2013:58).

Therefore, organisations are required to be aware of their material, processes and products, and they should understand that any of these could lead to emissions. Understanding the type of emission from the activities of the organisation might help the organisation to avoid some risks that are associated with the emissions. The risks, such as regulatory, reputational and litigation risk, could be avoided by organisations through monitoring and managing emissions (DEFRA 2012:30). Table 8.9 provides a list of items that should be reported under the sub-category ‘Emissions of effluent, waste and other emissions into the air’.

Table 8.9 List of items that should reported under sub-category 'Emissions of effluent, waste and other emissions into the air'

S/N	Item	Information to be reported under the item
1	GHG emissions	• Total quantity of GHG emissions in terms of their carbon dioxide (CO_2) equivalent per year and per unit output • GHG emissions by source (e.g. coal, fuel, gas) • GHG emissions by facility or by segment level • Compare GHG emissions with the previous year • Description of the methodology used to calculate GHG emissions
2	Nitrogen oxides	• Nitrogen oxides (NO_x) emissions in tonnes per annum
3	Sulphur dioxide	• Sulphur dioxide (SO_2) emissions in tonnes per annum
4	Particulate matter	• Particulate matter (PM) emissions in tonnes per annum
5	Waste water discharge	• Permits for discharge of waste water • Quantity of waste water discharges per annum and per unit of output • Quality of waste water discharged and the destination
6	Solid waste generated	• Quantity of solid waste generated per annum and per unit output (by weight, type and disposal method) • Internal waste handling procedures (i.e. collection, sorting and disposal)
7	Hazardous waste generated	• Type and quantity of hazardous waste generated per year and per unit output • Volume of hazardous waste stored on and off-site

Note: S/N = Serial number

Source: Author's compilation

8.6.3.5 Land use and biodiversity

The operations of some organisations require large spaces to perform their activities. For instance, mining and cement organisations depend on land to operate as their raw materials are mined from earth. The activities of these organisations may involve clearing of vegetation, cultivation of soil, release of chemicals to the soil, and even subjecting the soil to elevated temperatures and chemical conditions (see IFC 2007a; IFC 2007c). Such activities may result in disturbing the ecosystem,

soil pollution, pollution of water bodies hence affecting both flora and fauna. On the other hand, some organisations not only affect the biodiversity, but their products are derived from biodiversity. Products such as lubricants, perfumes, dyes, paper, waxes and rubber are derived from various plant species (Singh, Singh & Gupta 2014:671). By reporting their significant effect on biodiversity, organisations can identify and understand the risk associated with biodiversity and devise a strategy to mitigate these effects.

Therefore, this item intends to provide information on how organisations are committed to management of land affected by their activities by identifying the impact on environmental systems. Table 8.10 lists the items that should be reported under the sub-category 'Land use and biodiversity'.

Table 8.10 List of items that should be reported under the sub-category 'Land use and biodiversity'

S/N	Item	Information to be reported under the item
1	Land use	• Area of land disturbed • Area and percentage of land rehabilitated • Area of land used as a buffer zone • Area of land subjected to dryland salinity • Area of land with significant erosion of topsoil • Posting of rehabilitation bonds to government • Availability of rehabilitation plan
2	Habitat impacts	• Level of habitat impacts and restoration as a result of operations of the organisation

Note: S/N = Serial number

Source: Author's compilation

8.7 CHAPTER SUMMARY

The framework that was developed was divided into two main parts. In the first part, the framework requires organisations to follow four steps in identifying which environmental aspects to be reported. The steps are:

- identifying key environmental aspects and impacts;
- developing environmental performance indicators;
- setting objectives and targets; and
- measuring, evaluating and reporting.

In the second part i.e. the reporting process, the framework provides guides on the contents and structure of the reports. When reporting, the framework requires organisations to classify environmental information into three categories, i.e. 'Organisational context', 'Management performance, policies and systems' and 'Environmental performance'. The category 'Organisational context' provides information about general organisational activities and management. The 'Management performance, policies and systems' category provides information related to management effort and capability in managing issues (such as policies, planning, people, practices and procedures) that have an influence on environmental performance of the organisation, while 'Environmental performance' provides information on the performance of operations of an organisation.

The organisation should prepare the reports by taking into consideration the principles of accuracy, relevancy, comparability, clarity, reliability and completeness of the communicated information. This will ensure that the reported information provides a faithful, true and fair account of the environmental impact of the organisation.

The next chapter present the results for evaluation of the current feasibility and applicability of the developed ERF in Tanzania.

CHAPTER 9

CASE STUDIES – VALUE ADDED BY THE FRAMEWORK

9.1 INTRODUCTION

This chapter reports on the investigation into the feasibility and practicalities of applying the environmental reporting framework (ERF) as discussed in Chapter 8. The chapter intends to report on the extent to which the industrial sector will be able to report environmental information using the framework that was developed. The steps to be followed when preparing environmental reports and the content to be included in reports as proposed in Chapter 8 were tested to establish their feasibility. In this regard, the opinions from relevant stakeholders were gathered to determine the extent to which the framework is acceptable and implementable. Specifically, the framework was distributed to officials responsible for preparing environmental reports in their organisations, and they were asked to indicate those sections of the framework that they regarded to be implementable or not, with reasons for their responses.

The chapter starts with a discussion of the choice of the organisations included in the case (section 9.2). This is followed by the historical background of selected organisations in sections 9.3 and 9.4. Section 9.5 provides a brief discussion of the procedures followed when testing the framework. Finally, sections 9.5.1 and 9.5.2 present the results for Geita Gold Mining (GGM) and Tanzania Breweries Limited (TBL), followed by a discussion of the results in section 9.6.

9.2 ORGANISATIONS INCLUDED IN CASE STUDY

For an organisation to be included in the case study, it was necessary to be among the organisations that provide environmental information as identified in Chapter 7. As indicated in Chapter 7, a total of 20 organisations were identified to report environmental information in their annual and environmental reports. Therefore, out

of 20 organisations, two organisations (i.e. GGM and TBL Arusha branch) were selected purposively as cases to investigate the feasibility and practicalities of applying the ERF discussed in Chapter 8. Two organisations were selected for testing the framework because it was assumed that the applicability of the framework might differ across industries. It was thought that including two organisations might improve the validity of the framework. In addition, GGM and TBL were selected because they are listed in Dar es Salaam Stock Exchange (DSE) and experienced in public reporting. Therefore, the selected organisations were contacted to participate in the testing of the framework, and both agreed to participate. Section 9.3 provides a brief background of the organisations that participated in testing the framework.

9.3 HISTORICAL BACKGORUND OF GGM

GGM is a subsidiary of AngloGold Ashanti Company located in Geita. The core business of the company is gold mining and processing. The mining operates under special mining licence number 45/99 of 1998 and the permit number is FD/RES/Geita/44 of 1999, which allows the mine to operate in the forest reserve. Mining activities started early in 1939 and then closed in 1966 due to economic and political uncertainties. Exploration works resumed in 1998 with full mining activities taking place from mid-2000 while extracting ore material from one pit alone. By the end of 2016, seven pits had been established, of which three pits are still operating in full and one pit was suspended in February 2016 due to low gold recovery.

9.4 HISTORICAL BACKGROUND OF TBL

TBL Arusha branch is a subsidiary company of the SABMiller group principally engaged in the production, distribution and sale of malt beer, non-alcoholic malt beverages and alcoholic fruit beverages in Tanzania. The Arusha plant has the capacity of producing about 700,000 hectolitres of beer per annum and operates continuously in the brew-house 24 hours per day, 7 days per week in the packaging

plant under a total staff complement of about 250 personnel. The nameplate capacity of the facility is about 840,000 hectolitres per annum. The packaging plant has a design capacity of about 900,000 hectolitres per annum under a 3-shift operation. There is one brew-house and one packaging (bottling) line.

9.5 PROCEDURES FOLLOWED WHEN TESTING THE FRAMEWORK

The purpose of the case study was to investigate the feasibility of applying the framework that was developed. Specifically, the aim was to assess whether the proposed steps to be followed by the organisation when preparing environmental reports and the proposed items (content) to be included in the environmental reports are implementable or not. The framework was presented to officials responsible for preparing environmental reports, and they were requested to indicate those sections of the framework that they regarded to be implementable or not. The presentation was followed by an in-depth discussion between the researchers and company officials. The purpose of the discussion was to provide an avenue for the officials to share practical experiences regarding the activities of the organisation and the way the organisation prepares its environmental report and ways in which its practice compares with the framework. Section 9.5.1 provides the results for the case study.

9.5.1 Results for GGM

At GGM, the researcher had an in-depth interview and discussion with the environmental superintendent whose responsibilities it was to implement corporate standards relating to water management, waste and chemical handling, biodiversity, rehabilitation of a mine at the end of its life, air quality and management of incidents. At the time of this research, the official was also responsible for implementing the EMS and managing compliance.

The next section presents the results of the interview with the official.

9.5.1.1 Steps to be followed when preparing an environmental report

The GGM official was informed that the ERF requires the user to adhere to the required steps in the order of identification of environmental aspects and impacts, development of environmental performance indicators, setting objectives and targets, and measuring, evaluating and reporting. The GGM official indicated that these are the procedures that are normally followed by any organisation who wants to protect its environment. The official argued that the organisation cannot manage its environment without knowing its significant environmental aspects and impacts. The official added that for any project, which needs to be implemented in Tanzania, the Environmental Management Act 2004 requires an EIA to be conducted first. The proposed steps in the ERF are normally followed when conducting an EIA in Tanzania. GGM also follows these steps when preparing its environmental reports. The GGM official therefore concluded that the above steps were valid and implementable.

Moreover, in the process of identifying significant environmental aspects, the official indicated that at GGM, each division identifies its environmental aspects. “At GGM, every division identifies its environmental aspects and certain aspects may be significant to one division and not significant to another division.” Overall, some of the significant environmental aspects at GGM includes; dust emission, spills of chemicals, waste generation, land disturbance, noise and vibrations. In addition, the official indicated that various issues are taken into consideration at GGM when setting the objectives and targets to manage the identified significant environmental aspects. According to the GGM official, when setting objectives, things that are taken into consideration are significant environmental aspects, legal requirements, audit findings, inspection reports, risks and incident reports. After setting the objectives and targets, GGM monitors the performance and at the end of the year, the annual review is conducted. In this way, the objectives and target are set each

year. The GGM official explained, “among the objectives for year 2017 was to manage waste segregation. Waste segregation has been a challenge here at GGM. If not properly managed un-segregated waste attracts fines and penalties by the government”. According to the official, in 2017, GGM set a target to segregate waste by 90% and they managed to exceed the target and achieved segregation by 97%.

9.5.1.2 Contents to be included in environmental report

As specified in Chapter 8, the ERF requires organisations preparing environmental reports to classify the environmental information into three categories, i.e. ‘Organisational context’, ‘Management performance, policies and systems’, and ‘Environmental performance’. Every item under each category was judged by the GGM official whether it is practicable or not.

Under the category ‘Organisational context’, information proposed to be reported comprises:

1. organisational profile;
2. top management commitment to environment;
3. environmental management policies and systems;
4. overview of the significant environmental risks and potential impacts of the organisation;
5. establishment of the environmental objectives and targets;
6. environmental compliance obligations;
7. budget for environmental management; and
8. environmental management board and committee.

The GGM official noted that all the proposed items were valid, and said, “it is possible to be reported as most of the information is available”. The GGM official agreed that information related to top management commitment to the environment was important to be reported and that environmental policy portrayed commitment of the organisation to the environment. The GGM official said, “all the information

enquired in the category can be easily implemented by GGM. Here we have environmental policy which shows how we are committed to environmental protection in our business" (See Appendix K). The GGM official added that information regarding an overview of the significant environmental risks and potential impacts of the organisation, and the establishment of the environmental objectives and targets is essential to be included in any report concerning the environment as it carries important information to be communicated to stakeholders. The official further added that the organisation is guided by legal requirements (for instance dust emission requirements), best practice worldwide and research results when setting environmental target. Regarding the information on environmental compliance obligations, the official argued that it was difficult to communicate this information because the organisation had many laws and regulations to which it had to comply. The official suggested that any one requiring this information should ask for a compliance audit report, which shows the regulations with which the company should comply as well as level of compliance already achieved.

Likewise, under the category 'Management performance, policies and systems', the official indicated that most of the items that should be reported was available and GGM has been reporting it. For instance, information related to environmental management system available the official indicated that their operations had been ISO 14001-certified (See Appendix L) since 2001, and they have updated their systems as the ISO 14001 requirements changed. Regarding measuring performance against set standards and requirements, the official explained that they monitored the performance achieved by the organisation (e.g. water and air quality) by comparing the actual performance measured against standards. For example, before discharging waste water, they always monitor the water quality against the water quality standard issued by the NEMC. Further, the official added that they had audit programmes, which were among the major requirements for ISO 14001. Regarding the availability of environmental risk management strategies, the official

said that risk systems to identify risk are available. In particular, at GGM, they use AngloGold Ashanti Limited (AU)-risk system and the Bowtie system to identify and measure risks.

Moreover, regarding the question whether GGM had cleaner production plans to minimise emissions and waste and maximise output the official responded that the plans were available and depended on the challenge available at hand. For instance, the official said,

> The high concentration of cyanide going to tailings storage facility (TSF) was a major challenge to the organisation. To date we have managed to implement a technology, which helped to reduce the concentration of cyanide and at the same time increased the amount of water recycled.

Regarding the information on availability of a department or office that deals with environmental management, the official responded that they had a section called Health, Safety and Environment (HSE) (See Appendix M). Furthermore, the official explained that GGM had an environmental training and awareness programme. The official said, “every new employee joining the organisation receives HSE induction”. For existing employees, awareness training is provided regularly through email, the Internet and the noticeboard. In the same way, environmental awareness training is provided to visitors. In addition, GGM provides training on environmental protection to villagers twice a year. Regarding the availability of environmental grievance handling procedures, the official agreed that the procedures were available and a grievance officer was available to handle the grievance. The official said, “we have a grievance committee which include people from security, environment, community, a lawyer and a doctor”. The grievance official is responsible for coordinating the procedures and acts as chairperson during committee meetings.

Regarding the involvement of the organisation in supporting environmental protection, the official agreed that they supported the protection campaigns. For

instance, they donate trees to NGOs, schools and even government agencies for planting in different areas. The officer further pointed out that the organisation was surrounded by the protected areas; however, they had a challenge as villagers were cutting down the trees for fire wood and for making charcoal. As a result, the organisation has undertaken an initiative to educate the villagers on the impact of cutting down trees and have helped them to open other businesses such as brick making, welding and sewing. Likewise, the official pointed out that GGM is engaged in helping small-scale miners in the proper use of mercury and a sustainable way of extracting gold.

Regarding whether the organisation considers designing facilities in harmony with environment, the official agreed that the organisation considered designing facilities, which were environment-friendly. For instance, the official said, “we have designed a wash bay with an oil–water separator. When a car is washed, oil is collected and stored.” To ensure no oil spills into the environment, no car is allowed to be washed outside of the wash bay. Furthermore, regarding the involvement of the organisation in prevention and rehabilitating or restoration due to damage caused to the environment, the official agreed that they were involved. “We have a rehabilitation programme whereby both the rehabilitation plan during mine closure and a progressive plan is available.” For example, the official pointed that in 2017 “we have managed to rehabilitate 7.9 hectares of land that had been disturbed”. Regarding whether the company is involved in conserving natural resources, the official agreed and pointed out that they were recycling water from TSF and waste, such as steel, plastics, oil and electronics. The official said, “we do not involve ourselves in recycling the waste but after collecting and segregating the waste, we contract a dealer who have permits and ensure that the wastes are sent to the required destination”.

Moreover, regarding the issue of compliance requirements, the official agreed that GGM often pays penalties for non-compliance with central government and local government regulations. “Recently we have paid a penalty to the government for dust emission.” Regarding information related to liabilities required by laws and regulations, the official pointed out that GGM has a liability related to mining closure and each quarter a mining closure liability plan is prepared. Regarding whether the organisation have had legal proceedings instituted for violating environmental laws, the official responded that they have not had any legal proceedings instituted against them. “Here we prefer to handle our issue with government out of court.”

Furthermore, regarding the information on any environmental achievements and awards, the official pointed out that the last time the organisation had received an award was in 2006. The GGM official suggested that it was beneficial to report information on the achievement of awards because it amplifies the credibility of the organisation. Regarding information on any cost incurred in managing the environment, the official responded that the GGM had the information; however, they do not include it in their environmental report. Regarding information on any fees paid related to environmental licences, taxes or charges as condition for operations, the official responded that GGM paid inspection fees to the NEMC, annual registration maintenance fees to the Government Chemist Laboratory Authority (GCLA), a water use fee to Lake Victoria Basin, as well as a renewal licence and clearance fee to government.

Regarding information on environmental incidents and the cost of these, the official explained that they had a section for incident reporting in the annual report where each incident, which had occurred during the year, is reported. The official said, “we have a section about environmental incidents in our annual report and information on the measures that have been taken to avoid the recurrence of the incident is also provided.” Regarding the information on the cost incurred by the organisation related

to CSR the official explained that they do not normally provide such information in an environmental report; however, information is available on community affairs reports. The official said, “I don’t think that it is an issue to include such information in environmental reports because we already include it in community affairs reporting.”

Under the category ‘Environmental performance’, the items proposed to be reported are:

- energy consumption;
- water consumption;
- material and other resources used;
- emissions of effluent, waste and other emissions into the air; and
- land use and biodiversity.

According to the official, all items proposed above are being reported in GGM annual environmental reports. Regarding the information related to energy consumption, the official pointed out that GGM uses diesel engines to generate its own electricity, which is sufficient for production and other activities. Therefore, at GGM, no energy is resourced from renewable sources. Regarding the possibility of reporting energy use by facility or by segment, the official pointed out that this is possible because the information is available per power plant unit. The official pointed that, at the time of this research, there was no information related to the amount of energy saving achieved as a result of conservation and efficiency initiatives by GGM. Regarding the information of equipment containing power and saving devices, the official pointed out that some equipment and facilities of the organisation have been installed with equipment (such as energy-saving tube lights), and such information could be included in environmental reports. Regarding whether the information related to system energy balance analysis was available to the organisation, the

official pointed out that such information was available and could be communicated to stakeholders.

Regarding information related to water consumption, the official explained that GGM used water from the municipal supply (from Lake Victoria) and a permit for water use is available. However, at that stage, GGM was planning to sink boreholes for one site, which was not connected to the municipal water supply. Furthermore, on the question whether it was possible to report the total water consumed per year and per unit output, the official said that it was possible because the information was available. Likewise, the official indicated that it was also possible to report information related to water consumption by various uses, such as processing, cooling and sanitation, total quantity of water saved through efficiency measures, and total quantity of water recycled. In addition, the official pointed out that all the information related to material and other resources used could be reported because the information was available.

Even though GGM produces its own electricity, the official indicated that the information on GHG emissions was not available at the time. However, the information related to emission of nitrogen oxides, sulphur dioxide and particulate matter was available and could be reported. Regarding the information on waste produced by the organisation, the official pointed out that the organisation produces different wastes ranging from hazardous to non-hazardous waste, and solid to liquid waste. For instance, hazardous waste produced by the organisation comprises chemical waste, medical waste and used battery. Solid waste includes steel, rubber, wood, tyres and electronic waste. Furthermore, the organisation generates waste water and the quality is normally checked, and the organisation ensures that the discharge permit is available before the discharge. The official indicated that it is possible to report the quantity of solid waste and hazardous waste generated per annum. He said, “our organisation has records to most of the information regarding

its activities and the environment, so reporting of such information cannot be an issue".

Regarding information related to land use and biodiversity, the official indicated that most of the items that had been proposed to be reported were available and could be reported. For instance, the official explained that information related to the area of land disturbed, the area of land rehabilitated, the area of land with significant erosion on top could be reported by the GGM. The official said, "the information related to area of land subjected to dryland salinity is not available because our activities does not cause land salinity". Regarding information whether GGM have posted rehabilitation bonds to government, the official indicated that no bonds have been posted, but they were working on it. The official further indicated that they had a rehabilitation plan (annual and end mining closure plan). Regarding the information related to the level of habitat impacts and restoration as a result of the operations of the organisation, the official pointed out that it was possible to report such information. Specifically, the official said, "before disturbing a land normally the baseline study is conducted to identify various types of species that exist". Therefore, during rehabilitation, the species that existed before disturbance are replanted to restore the land to its original state.

To conclude, the ERF fitted very well into the settings and context of environmental reporting at GGM.

9.5.2 Results for TBL

During the visit to TBL, the researcher had an opportunity for an in-depth discussion with the TBL official (environmental manager). The following were among the key roles and responsibilities of the official, namely to –

- organise, implement and execute a Voyager Plant Optimisation (VPO) in the area;

- use effective loss and waste analysis to identify gaps in the plant environmental system versus VPO, and to drive actions to close the gaps;
- drive closure of environmental non-compliances on site;
- manage the plant and department indicators to achieve targets;
- manage the effluent plant and water treatment to reservoir and waste segregation areas;
- interface with relevant local government authorities and corporate affairs to ensure compliance with statutory environmental policies;
- ensure training capability exists (material and facilitators) suitable to cover mandated environmental training needs;
- ensure targeted good operating practice (GOP) compliance percentage is achieved;
- perform routine inspection and periodic audit to check compliance with the environmental requirements;
- manage the service level agreement (SLA) on influent and discharge management across the site;
- run evaluation and ensure projects or processes are implemented according to the internal and external environment requirements;
- coordinate and assure tracking and monitoring of environmental information on the zone is correctly and timeously submitted; and
- ensure accurate reporting of environmental incidents (pre-existing and new).

The discussion with the official led to the sharing of the following information.

9.5.2.1 Steps to be followed when preparing environmental reports

The official was asked to comment on the suitability of the steps to be followed when preparing environmental reports. Regarding the steps proposed to be followed when preparing the environmental report, the official indicated that the steps were valid

and implementable. The official indicated that identifying environmental aspects and impacts enables the organisation to prepare the environmental management plan. The official said, “at TBL, in order to identify environmental aspects and impacts we do process mapping”. Which means each activity at every stage of production is analysed and for each identified significant aspect the control measure is set. In case of no control measures the organisation normally provide the improvement plan. According to the official, an environmental department is responsible for the identification of the environmental aspects and impacts of the organisation. In addition, the official emphasised that all organisations should have an environmental policy in order to engage effectively in environmental protection activities.

According to the official, the major significant environmental aspects for TBL are waste water generation, water consumption and energy consumption. The official said, “a large quantity of water is used in manufacturing of beer itself whereby three hectolitre of water produces one hectolitre of beer”. In addition, water is used in other activities, such as washing, cleaning and sterilising different units after production. The official further clarified that TBL normally sets targets for water and energy use for each section. In case the target set is not met, a special team (comprising members from different departments) is formed to identify the reasons for not meeting the target and to suggest improvements. Apart from waste water, the organisation also produces solid waste (a by-product), which has commercial value and is sold out as animal feeds.

The official pointed out that, when setting objectives and targets, various monitoring reports (e.g. air emission and effluent management reports) are taken into consideration. Likewise, both internal and external requirements (i.e. legal requirements) are considered when setting objectives and targets. For instance, the official said, “if the requirements from external exceeds internal requirements then

the external requirement will be considered and vice versa". Like GGM, after setting the objectives and targets, TBL monitors performance and at the end of the year, the annual review is conducted. "In the year 2017, the organisation has set a target to use full renewable energy by 2025." However, at the time of this research, TBL was using electricity from TANESCO (national grid) and heavy fuel oil (HFO) as source of energy.

9.5.2.2 Content to be included in environmental report

Information recommended to be reported under the category 'Organisational context' comprises:

1. organisational profile;
2. top management commitment to the environment;
3. environmental management, policies and systems;
4. a descriptive overview of the significant environmental risks, and potential impacts of the organisation;
5. establishment of the environmental objectives and targets;
6. environmental compliance obligations;
7. budget for environmental management; and
8. environmental management board and committee

Regarding the information to be reported under the category 'Organisational context' the official agreed that the items proposed under this category should be reported by TBL. However, he pointed out that information related to a statement from the CEO (i.e. commitment from top management) and information related to environmental management policies and systems looked similar to what he thought and he suggested deletion of one of the similar items. Regarding the information related to the environmental compliance obligation, the official pointed out that TBL has a number of regulations with which to comply. For instance, TBL is required to comply with air emission regulation, water quality regulations and solid waste

disposal regulations. He said, “to make the compliance easy we have an up-to-date register for all laws and permits and their respective budgets”. Moreover, the official pointed out that TBL has a budget to deal with environmental issues. Regarding whether TBL has an environmental board and committee, the official pointed out that TBL has an environmental committee, which comprises one member from each department (five departments). The environmental manager is the chairperson and they meet once a month to discuss environmental issues.

Under the category ‘Management performance, policies and systems’, the TBL official indicated that most of the item proposed could be produced by TBL. He said, “we have the information related to the proposed items, so we can report it”. For instance, regarding information related to the environmental management system available at the TBL, the official indicated that the organisation uses a software called cr360 whereby information like environmental risks, incidents, and non-compliance is lodged in for processing. Regarding measuring performance measured against set standards and requirements, the official explained that TBL monitors the performance achieved by the organisation every day and in case the performance is not attained, it is discussed and an action plan is effected. The official pointed out that every employee in the organisation is aware of the existing policies, and they ensure that activities are implemented according to the internal policies. In addition, the official said that they had an environmental monitoring and audit programme (internal and external audits). He clarified that the external audit is conducted once a year as this is a requirement of the NEMC, and their reports are available and can be part of the information in the annual environmental reports.

Moreover, regarding the question whether TBL has a cleaner production plan to minimise emissions and waste and maximise output, the official pointed out that TBL has a plan to use full renewable sources in their processes by 2025. However, at the time of this research, they were using electric supply from the national grid

and HFO in their production. In addition, TBL has an effluent treatment plant with a capacity of treating 1, 270 hectolitres of waste water per day.

Regarding information on the availability of a department or office that deals with environmental management, the official said that TBL has such a department. He added that the department comprise one member (i.e. the head of department). However, there are other members from other sections (such as contractors, waste water treatment people, solid waste collectors and cleaners) who report to the head of the environmental department.

Furthermore, regarding availability of environmental training and an awareness programme, he said, “we have an environmental training and awareness programme and the information can be included in the environment report”. For instance, new employees as well as existing employees normally receives training on environmental and safety training. Likewise, the official pointed out that buyers of by-products are trained in how to use the product and they always follow up to make sure the product sold to them is used as intended.

Regarding the availability of environmental grievance handling procedures, the official agreed that the procedures were available and could be included in the environmental reports. He clarified that if there were any problems the complainant was advised to file a complaint to the corporate affairs section. If the complaint is genuine, the issue is taken into consideration for solving. Regarding the involvement of the organisation in supporting protection of the environment, he agreed that TBL supports the protection campaigns. For instance, TBL has been participating in celebrating Environment Day (05 June) and World Water Day (22 March) to show the commitment of TBL to environmental issues. In corporation with the Arusha municipality, TBL has been participating in planting trees. In addition, the official pointed out that in Arusha municipality, there is a water scarcity; therefore, TBL

provides water service for free to the community surrounding the organisation. He agreed that TBL could include such information in its environmental reports.

Regarding the question whether the organisation considers designing facilities in harmony with the environment, the official agreed that the organisation considers designing facilities that are environment-friendly. The official clarified that before acquiring or designing a facility, both the environmental and safety manager are consulted, and their opinions form part of the final decision.

Moreover, regarding the question whether the organisation involves itself in preventing and/or rehabilitating or restoring the environment the official agreed that they were involved. He said that risk analysis is conducted to ensure all significant risks are taken into consideration before they harm the environment. For instance, he said, “currently we have an underground fuel storage tank and we plan to build an above ground tank in order to make the monitoring process easy”. Regarding whether the company is involved in conserving natural resources, the official agreed and pointed out that TBL recycle water, which is used for gardening and cleaning. Like GGM, TBL is not involved in recycling the waste but they collect and send it to the required destination. For instance, the official clarified that broken bottles and worn-out bottles are collected and sent to the company dealing with making glass products (Kioo Limited) while broken plastic is collected and sent to a company dealing with plastic products.

Regarding reporting information related to compliance requirements, the official agreed that the information is important to be disclosed as it informs the reader on how the organisation complies with various requirements. However, he pointed out that, up to now, no penalties or fines have been paid by the organisation for non-compliance of regulations. In addition, he pointed out that there are not any legal proceedings for violating environmental laws. Yet, TBL is happy to include such information in their annual reports.

Furthermore, regarding information on any environmental achievements and awards, the official pointed out that TBL received an award from Arusha City Council for environmental protection in 2017. He added that NEMC and EWURA should also engage in providing awards to organisations who perform well instead of only giving punishment to organisations who perform badly. Regarding information on any cost incurred in managing the environment the official responded that the information is available. The TBL official said, “we have a special account dealing with environmental issues and such information can be included in our environmental reports”. Regarding information on any fees paid related to environmental licences, taxes or charges as conditions for operations, the official responded by saying that TBL pays –

- the water use permit and discharge fee to Pangani Basin;
- a large-scale beer and beverage fee to NEMC;
- a solid waste disposal fee to Arusha municipality;
- an environmental, hygiene and occupational fee to OSHA; and
- hazardous substance and chemical handling fee to GCLA.

Regarding whether it is possible to communicate information related to environmental incidents and the cost of it, the official responded that it was possible. Normally, TBL keeps a record of the incidents that occur and communicate this to the head office of the organisation. The incident is compared to similar incidents which occur elsewhere, and an action plan is prepared to manage the incidents. Regarding the information on the cost incurred by the organisation related to CSR, the official explained that TBL has a budget to support CSR and information is communicated in annual reports.

Under the category ‘Environmental performance’, the official indicated that the items that can be reported by TBL comprise ‘Energy consumption’, ‘Water consumption’, ‘Material and other resources used’ and ‘Emissions of effluent, waste and other

emissions into the air'. Regarding the information related to energy consumption, the official pointed out that TBL uses electricity from TANESCO, and diesel and heavy fuel as sources of energy. He clarified that information related to renewable sources, energy use by facility or segment and reduction in energy consumed is available and can be reported. Regarding the item 'Equipment containing power and saving devices', the official said that, as a strategy for reducing energy consumption, the organisation has fitted devices in heavy machines to measure, analyse and optimise consumption of energy at each plant. Most of the machines have been installed with soft starters in order to reduce the amount of energy consumed during machine start-up. In the same way, all plants have been fitted with solar panels, energy-saving light bulbs and biogas (as fuel for boilers). Regarding whether system energy balance analysis is conducted in the organisation, the official responded that it is done every month, and an energy audit is done once a year, thus the information can also be reported.

Regarding information related to water consumption, the official explained that TBL uses water from the municipal supply. He said the organisation requires large quantities of water in its operations and it operates in areas where water is scarce. He emphasised, "currently we are planning to look for other source of water to avoid competition for water with the surrounding local community". He also indicated that the information related to water consumed per annum, the quantity of water consumed for various uses, such as processing, cooling and sanitation, is known and can be reported. In addition, he pointed out that at TBL, water consumption is minimised by ensuring that water is used efficiently and recycled as much as possible.

Moreover, the official indicated that information related to materials and other resource use is available and can be reported. He said, "we use various types of materials in our production". For instance, TBL uses barley, hops and yeast, glucose

and enzymes to produce beer. Apart from material used to produce the beer itself, the process also uses various toxic or hazardous materials to maintain and sterilise the brewing equipment. In addition, TBL uses toxic substances in analysing samples in the laboratory. The final product uses different packaging materials, such as aluminium cans and glass bottles.

Regarding the information on GHG emissions, the official indicated that they started collecting such information on GHG in 2017. According to the official, information, such as total quantity of GHG per year and GHG emission by source and methodology used to calculate GHG emissions will be available in 2018 and can be reported. Regarding waste water discharge, he pointed out that TBL has a permit for waste water discharge and it is renewed each year. Waste water is discharged into Pangani Basin and before discharging the water, quality is checked to ensure the suspended solids, chemical oxygen demand and pH are as required. In addition, regarding the information of solid waste generated, he pointed out that the organisation produces solid waste, such as paper, wood, plastics, bottles, scrap metals and defective spare parts. Waste is segregated, and biodegradable waste is disposed of daily at the municipal dumpsite. On the other hand, hazardous waste is stored and disposed of after getting permits from NEMC. According to the official, the hazardous waste is sent to Tanga Cement for incineration once a year.

9.6 DISCUSSION OF THE RESULTS

Regarding the steps to be followed when preparing environmental reports (i.e. identification of environmental aspects and impacts, development of environmental performance indicators, setting objectives and targets, and measuring, evaluating and reporting), as indicated in the results, both officials from GGM and TBL agreed that these steps are necessary. They argued for the organisation to manage its environment, it first needs to understand its environmental aspects and impacts. Understanding environmental aspects and impacts enables the organisation to

identify which aspect is significant and to set control measures to reduce the impact (i.e. setting the targets and evaluating the results). For organisations with an EMS (ISO 14001), understanding environmental aspects and impacts is a key success factor for implementing the system. As indicated in Chapter 7 (see Table 7.3), 65% of the organisations who reported environmental information had an EMS available and most of them were ISO 14001-certified. This implies that the steps proposed in this framework were also followed by these organisations when implementing the EMS. Furthermore, even those organisations with no EMS in their operations, are required to conduct an EIA, a requirement from the NEMC. The proposed steps are also followed by these organisations when conducting an EIA. From organisations that will use the framework, it is expected that they will be able to follow the proposed procedures for preparing environmental reports. Therefore, it can be concluded that the steps to be followed when compiling an environmental report are valid and implementable.

Regarding the content to be included when reporting environmental information, both GGM and TBL officials indicated that most of the items that had been proposed to be reported by the organisations, are available and can reported. Specifically, under the categories 'Organisational context' and 'Management performance, policies and systems', the officials indicated that all proposed items can be reported. Under the category 'Environmental performance', the GGM official indicated that all items (i.e. energy consumption, water consumption, materials and other resources used, emission of effluent, waste and other emissions into the air, and land use and biodiversity) can be reported. The TBL official indicated that all proposed items, except the item 'Land use and biodiversity' can be reported. Therefore, it is expected that under the category 'Environmental performance', only significant environmental aspects and impacts will be reported as different organisations have different processes and impacts.

The results from the case study indicated that the information proposed to be reported by organisations operating in Tanzania is available and can be reported. However, when looking at the result on the extent of environmental reporting in Chapter 7, few items were reported by organisations. Most of the information reported came from the categories 'Organisational context' and 'Management performance, policies and systems', while information under the category 'Environmental performance' was little reported despite its importance to stakeholders. The results for the case study showed that organisations had almost all information to report, ranging from general information (i.e. organisational context) to specific information (i.e. environmental performance). As discussed in Chapter 7, among the possible reasons for not reporting the environmental information could be a lack of a framework to guide organisations on which items to report and how to report. Organisations have been left to decide on their own on which information to report. As a result, most of the organisations chose to report general information. Therefore, based on the test results, the ERF provides a guide to organisations operating in Tanzania on which environmental information to report and how to report when preparing environmental reports.

9.7 CHAPTER SUMMARY

Two organisations (i.e. GGM and TBL Arusha branch) were selected to investigate the feasibility and practicalities of applying the ERF. In particular, the steps to be followed when reporting environmental information and content to be included in a report, was tested to see its feasibility. Officials responsible for preparing environmental reports received the framework and were requested to read those sections of the framework and indicate if the framework is implementable or not. An in-depth discussion between the researcher and the officials was done. The purpose of the discussion was to provide an avenue for the officials to share practical

experiences on the activities of the organisations and the way the organisations prepare their environmental reports and how these compare with the ERF.

The results indicated that the steps to be followed when preparing environmental reports were valid and implementable. Normally, the proposed steps are followed by organisations who wish to protect the environment. Likewise, the results indicated that organisations have almost all the items to be included in reports. Specifically, all items proposed to be reported under the category 'Organisational context' are available and can be reported.

The next chapter presents the summary of the key findings and conclusion of the study. It also presents the contribution of the study, limitations of the study as well as suggestions for future studies. The chapter ends with a summary of the chapter.

CHAPTER 10

SUMMARY, CONCLUSION AND FUTURE RESEARCH

10.1 INTRODUCTION

The increase in awareness among people about the impact of business activities on the environment, an increase in the demand for environmental reporting by stakeholders, and the move by the IIRC to integrate both financial and non-financial information were motivations for this study. The aim of this study was to develop an environmental reporting framework (ERF) for the industrial sector in Tanzania. To achieve this aim, the study started by developing a disclosure index, which was used to measure the current extent of environmental reporting in the country. Thereafter the ERF was developed, followed by the case study for the industrial sector to determine the applicability of the ERF.

The main purpose of this chapter is to provide a summary of the key findings and the conclusion of the study. The chapter also discusses the limitations of the study and provides suggestions for future research.

Therefore, section 10.2 starts by restating the objectives of the study as described in Chapter 1 followed by section 10.3 which presents a summary of the results of the study. Section 10.4 presents the implications of the conclusion while section 10.5 presents the contribution of the study to the body of knowledge. The limitations of the study are presented in section 10.6, and this is followed by section 10.7, which reflects suggestions for future studies. The chapter ends with the chapter summary.

10.2 RESEARCH OBJECTIVES

As indicated in Chapter 1, this study had the following objectives, namely to –

1. develop a disclosure index to measure the current extent of environmental reporting in the industrial sector of Tanzania;

2. develop a framework to guide environmental reporting in the industrial sector of Tanzania; and
3. investigate the current feasibility and applicability of applying the reporting framework in the industrial sector of Tanzania.

To achieve the above objectives, the following research questions were employed to guide the research design, data collection process and data analysis.

1. Which environmental information do stakeholders require, and how is the information need currently being met?
2. Which instrument can the industrial sector use to report environmental information, and how should the information be reported?
3. What is the applicability of the ERF in the industrial sector of Tanzania?

10.3 SUMMARY OF THE RESULTS

As indicated in objective 1, the first step for this study was to develop an environmental disclosure index (EDI) to measure the current extent of environmental reporting in the industrial sector of Tanzania. However, for the EDI to be developed, it was necessary to identify which environmental information stakeholders require (as described in research question 1). The process to identify the environmental information needed by stakeholders started by reviewing the pertinent literature. The studies on environmental reporting and disclosure and international reporting frameworks were reviewed, and the items to be included in the initial disclosure index were identified by reviewing the disclosure indices used in environmental reporting and disclosure studies. From the disclosure indices, the items related to the environment were selected for inclusion in the disclosure index except if the item appeared to be similar to a previously chosen item. The identified items were grouped into three categories (i.e. 'Organisational context', 'Management performance, policies and systems' and 'Environmental performance').

The initial disclosure index was then sent to experts for their opinions using the Delphi inquiry method. The experts were requested to give their opinion on the items proposed for reporting, and to indicate whether the item should be retained or removed and whether there should be any addition of new items or information. The role of the experts was first, to confirm and validate the items to be included in the EDI, and second, to assess the importance of the disclosure of each item by allocating a weight to every item. The Delphi inquiry was conducted in three rounds. In round one disclosure index was sent to 30 experts and 25 responded. In round two 25 experts received the second disclosure index and 22 responded. In round three disclosure index was sent to 22 experts and all responded. The following subsections summarise the results for development of the EDI, the extent of environmental reporting in Tanzania, the ERF and the case study for the industrial sector.

10.3.1 Development of EDI

The initial EDI sent to experts consisted of 71 items, out of which eight items were from the 'Organisational context' category, 21 items from the 'Management performance, policies and systems' category and 42 items from the 'Environmental performance' category. Results for round one of the Delphi inquiry indicated that 25 out of the 30 experts returned the feedback. From round one, some experts suggested addition and/or deletion of items from the initial disclosure index. Nine new items were suggested to be added to the EDI and two items were suggested to be removed from the EDI. One item was proposed to be split into two items. In round two of the Delphi inquiry, the experts agreed to the suggestions made in round one. The nine items suggested were therefore added to the EDI, and two items suggested to be removed from the index were deleted. One item was split into two items. The final un-weighted disclosure index therefore consisted of 79 items.

In round three, the experts were asked to rate the items based on their importance. They were requested to rate the item using a five-point Likert-type scale (i.e. 1 – the item is unimportant, 2 – the item is of minor importance, 3 – the item is of intermediate importance, 4 – the item is important and 5 – the item is very important). The results for the final disclosure index indicated that overall, 61 of the 79 disclosure items were important, 17 items were of intermediate importance and one item was of minor importance. No item was considered by experts to be very important for disclosure in annual and environmental reports of the industrial sector. Also, none was considered to be unimportant.

10.3.2 The extent of environmental reporting in Tanzania

The extent of environmental reporting in Tanzania was measured using the developed EDI. Specifically, the extent of environmental reporting was measured by assessing the quantity (or volume) of environmental reporting and the importance of items reported as weighted by the experts during the Delphi inquiry. The quantity of environmental reporting was measured by counting the number of sentences reported in the annual and environmental reports. To extract the environmental information from annual and environmental reports, a content analysis approach was used. A sentence was used as the unity of analysis to measure quantity (or volumes) of environmental reporting as well as to codify environmental information from the reports.

The findings indicated that most items that were reported by organisations operating in the country came from the categories 'Organisational context' and 'Management performance, policies and systems'. Under the category 'Environmental performance', little was reported.

Regarding the quantity of environmental reporting, the findings showed that Organisation C was leading in environmental reporting followed by Organisations D and E. Organisations L, O and P were the least reported, with only three sentences

each. Industry-wide assessment indicated that mining and cement organisations were leading in reporting compared to other industries. The probable reason could be that the cement and mining industries are more regulated by government and influenced by international standards than other sectors.

Regarding the importance of environmental information reported, the findings showed that Organisations C and T were leading in reporting followed by Organisations E and S under the category 'Organisational context'. Under the category 'Management performance, policies and systems', Organisations D and E were leading followed by Organisations A and F. Organisation L scored zero (0) implying that it did not reported any information under this category. Furthermore, Organisation E was leading in reporting under the category 'Environmental performance' followed by Organisations C and Q. A total of 14 organisations did not report any item under this category.

The findings indicated that the items, which appeared to be most important to stakeholders (especially under the category 'Environmental performance'), were left unreported. The possible reason for not reporting the item could be due to a lack of guidelines to guide organisations on which item to report. For instance, the findings indicated that 65% of the organisations had EMSs available, which were ISO 14001-certified, and the score related to importance of environmental information could have been high. Another possible explanation for organisations not reporting environmental information could be a lack of legal requirements for reporting or poor supervision of existing regulations. Furthermore, other reasons for poor reporting among organisations could be that environmental reporting implies costs therefore it is difficult to get such information. However, in some cases, this information is available to the organisation at little or no additional cost. This is true, because an EIA has to be undertaken, before implementing any project with significant

environmental impact in the country. In addition, most of the organisations have EMSs in their operations implying that they already have the information to report.

10.3.3 Environmental reporting framework

The ERF was developed after considering the extensive literature review on environmental reporting, a review of the current legal framework on environmental issues in Tanzania, getting the opinions of the key stakeholders on the items, which are important for reporting, and an analysis of the current extent of environmental reporting in Tanzania. The framework aims to facilitate environmental reporting to organisations operating in the country by providing information, which is reliable, relevant and of interest to the stakeholders. In particular, the framework aims to guide the first-time reporter, as the majority of organisations in Tanzania do not disclose environmental information in their reports. In addition, the framework also aims to provide guidance to organisations, which already disclose environmental information in their reports.

The ERF has mainly two parts. The first part provides the steps to be followed when preparing environmental reports. The second part provides a list of items that should be included when preparing reports. The framework requires the company to follow the following steps:

- identify key environmental aspects and impacts;
- develop environmental performance indicators;
- set objectives and targets; and
- measure, evaluate and report.

Identifying the environmental aspects and impacts enables the organisation to understand which environmental issues are relevant to the business and the extent of the impact these have on the environment. Further, developing an environmental performance indicator assists the organisation to monitor and evaluate the success

of environmental performance by the organisation. In addition, indicators provide a basis for making comparisons between different periods of measurement within the organisation as well as between organisations. Setting objectives and targets helps the organisation to increase the credibility of the report produced, declares publicly the environmental commitment and compares and monitors the performance easily.

Furthermore, regarding what should be included in the report, the framework requires the organisation to classify the information into three categories (i.e. 'Organisational context', 'Management performance, policies and systems' and 'Environmental performance') when reporting environmental information. The 'Organisational context' provide information about general organisational activities and management. The information provided under this category gives the reader an understanding of the activities, services and operations of reporting organisations and the way the organisation itself is committed to environmental protection issues. Information such as organisational profile, top management commitment to the environment, environmental management policies and systems, establishment of environmental objectives and targets, environmental compliance obligations, budget for environmental management, and environmental management board and committee were proposed to be reported under this category.

The 'Management performance, policies and systems' category aims to provide the reader with information related to management effort and capability in managing issues that have influence in the environmental performance of the organisation. The environmental performance of the organisation may be influenced by the effort and decisions taken by management. Therefore, management may be interested to evaluate itself on how they have succeeded in implementing environmental policies and programmes throughout the organisation, or how effective the management system is in complying with requirements or expectations and how they have succeeded in implementing their programme in the local community related to

environmental issues. In the same way, management may be interested to show the effort they have made under this category in managing issues such as training, efficient utilisation and allocation of resources and product development. Information, such as having an EMS available, performance measured against set standards and requirements, adherence to internal policies, environmental monitoring and audit programme, was proposed to be reported.

The 'Environmental performance' category intends to provide information on the performance of the operations of an organisation. The operations of the organisation may be categorised based on the inputs, processes and outputs from its physical facilities and equipment. Therefore, environmental performance may be reported by looking at the operations of the organisation and the impact related to inputs (such as materials, water and energy) and outputs (such as emission into the air, waste and effluents). Similarly, the category may include the impact by the organisation related to biodiversity and land use, products and services. Under this category, items such as 'Energy consumption', 'Water consumption', 'Materials and other resources used', 'Emissions of effluent waste and other emissions into the air' and 'Land use and biodiversity' were proposed to be reported.

10.3.4 Case studies – value added by the framework

After developing the ERF, it was necessary to investigate feasibility and practicalities of applying the framework. The aim of the case studies was to investigate the extent to which the industrial sector would be able to report environmental information using the ERF. Precisely, the steps to be followed when preparing environmental reports and the content to be included in a report were tested to see whether the ERF is feasible to be used in Tanzania. Two organisations, GGM and TBL (Arusha branch), who reported environmental information, were purposely selected to be included in testing. The selected organisations were contacted to participate in testing the ERF and all agreed to

participate. The ERF was presented to officials responsible for preparing environmental reports and they were requested to indicate those sections of the ERF, which they regarded to be implementable or not.

The results showed that the steps to be followed when preparing environmental reports are valid and implementable. The officials pointed out that the proposed steps to be followed are normally followed by organisations who wish to protect the environment. Understanding environmental aspects and impacts enables organisations to identify which aspects are significant and set control measures to reduce the impacts. In the same way, regarding the content to be included in the reports, the results indicated that organisations have almost all items proposed to be included in reports. Specifically, all items proposed to be reported under the category 'organisational context' are available and can be reported.

10.4 IMPLICATIONS OF THE CONCLUSIONS

The results of this study may have regulatory and policy implications. The study may also have the potential of attracting the attention of those concerned about environmental reporting and who may be interested in using the findings to inform the future endeavour to guide the corporate environmental disclosures by Tanzanian companies. The findings on the extent of environmental reporting in Tanzania would suggest that if environmental reporting was left as a voluntary practice to be adopted, it is doubtful that the practice will be improved or be of any substance in Tanzania in the future unless it is in the self-interest of the organisation concerned and under its full control. Any efforts to build up the practice may be destined to failure if management is left to decide. Based on this conclusion, there is neither willingness on the side of the business community nor any pressure or encouragement on the side of society to promote transparency.

Therefore, to ensure that more accurate and reliable information on environmental activities is reported, there has to be authoritative pressure on the management of

companies to encourage and require such practice to be implemented. As indicated in Chapter 9, organisations have almost all information required for reporting. However, the results indicated that at the time of the research, environmental reporting in the Tanzania showed that only information related to the organisational context of the companies was reported. This implies that even if the ERF were available, if there is no legislation governing environmental reporting in the country, reporting will still be of low quality.

Moreover, the study findings provided valuable insights for managers who wish to improve the environmental information given to various stakeholders to enhance their decisions. For instance, investors who wish to identify the financial worthiness of their investment made, researchers who engage with corporate environmental reporting, the surrounding community who wants to know how responsible the organisation is in protecting its environment, government who wants to know how an organisation has been complying with the existing laws and regulations will be able to make informed decisions if quality information from management is provided.

10.5 CONTRIBUTION OF THE STUDY

This study contributes to the existing body of knowledge in different ways. First, it is the first study in Tanzanian context to evaluate the extent of environmental reporting by the Tanzanian industrial sector empirically. The study introduced the EDI for evaluating environmental reporting in Tanzania. More specifically, the index reflects the list of items to be reported as suggested by various environmental experts working in Tanzania.

Secondly, the study presents for the first time the status of environmental reporting in Tanzania. The result may be used by other scholars for furthering other study related to environmental reporting in accounting science field.

Thirdly the study introduced the ERF to be used by various organisations operating in Tanzania. The framework provides guidance on the steps to be followed and the content to be included when preparing environmental reports. Organisations who operate in the country (both those who were identified to be reporting environmental information and non-reporters) will be able to use the framework to prepare environmental reports. Thus, organisations using this framework will be able to understand the report and the needs of the stakeholders accordingly.

10.6 LIMITATIONS OF THE STUDY

Like any other research, this study was not free from limitations. Firstly, the construction of disclosure indices is susceptible to subjectivity or bias. Subjectivity in the construction of disclosure indices has been recognised previously by Okoli and Pawlowski (2004). In this research, there was subjectivity in selecting the items to be included in disclosure index, in weighting the disclosure items for their relative importance, and in coding the annual and environmental reports in the content analysis. Subjectivity in selecting and weighting the items was mitigated by selecting items for the disclosure index from the environmental reporting studies and seeking validation of the items from experts during a Delphi inquiry. Likewise, to mitigate the subjectivity resulting from the coding process, an independent coder was employed. Differences arising in the coding process between two coders, i.e. the researcher and an independent coder, were found, compared and discussed to reach consensus.

Secondly, the study focused only on two media types used for environmental reporting (i.e. annual reports and environmental reports), whereas other media, such as websites, brochures and live broadcast press releases were not considered. Focusing on only two media types, there was a possibility that some environmental disclosure might have been missed. However, it was argued that it is not possible to scrutinise all media available to report environmental information since the issue

of identification of consistency and completeness of these reports over a long period was expected to be challenging (Hammond & Miles 2004:65; Unerman 2000:670). Unerman (2000:671) emphasises that, although several disclosure media may be accessed, a limit should be put on the number of disclosure media to be examined in order to make sure that the data is complete and consistent.

Thirdly, in determining the extent of environmental reporting in Tanzania, the research was limited only to organisations whose activities were considered as having a high level of impact on the environment. The organisations whose activities were considered to have a low level of environmental impact, such as banks were excluded from the study. In addition, in analysing the extent of environmental reporting in Tanzania, annual and environmental report data from only one year (2015) was considered.

Lastly, to gain a deeper understanding of the issues surrounding environmental reporting in a real-world setting, a case study for the industrial sector was conducted. However, the case study was limited to only two organisations (TBL and GGM) representing two industries (i.e. mining and beverage sector).

10.7 SUGGESTIONS FOR FUTURE STUDIES

Based on the limitations demonstrated by the present study, the following suggestions are made for future studies. Given that construction of disclosure indices is susceptible to subjectivity or bias, the study suggests that, in order to validate the findings of the present study, further research is required that will replicate the present study using a similar control and judgment scale. Moreover, it is suggested that future studies should also expand the analysis of the extent of environmental reporting by employing many other alternative media as well a period of more than one year to provide a more representative picture of environmental reporting in Tanzania.

10.8 CHAPTER SUMMARY

This chapter summarised the results and findings of the present research. It summarised the results for the development of a disclosure index, the extent of environmental reporting in Tanzania, the development of ERF and a case study of the industrial sector. Particularly, the results suggested that, if environmental reporting is left as a voluntary practice to be adopted, it is doubtful that the practice will be improved or be of any substance in Tanzania unless it is in the self-interest of the organisation and under its full control. Therefore, to ensure more accurate and reliable information on environmental activities is reported, there should be authoritative powerful pressure on management to encourage and require such practice to be developed.

The chapter also discussed the contribution of the study to knowledge and the limitations of the study. The main contribution of the study was that this was – to the best of the researcher's knowledge – the first study to address environmental reporting in Tanzania empirically. The study introduced the EDI for evaluating environmental reporting. In addition, the study introduced the ERF to guide the industrial sector in environmental reporting. Moreover, subjectivity in constructing indices, the use of two media and a single period in assessing the extent of environmental reporting in Tanzania and using only two organisations in testing the environmental framework that was developed were pointed out as limitations of the present study.

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APPENDICES

APPENDIX A

Initial disclosure index items

Disclosed item	Source
1. Organisational context	
1.1 Organisational profile This includes name of the organisation, nature and type of the activities of the organisation, type of product, size of organisation, nature of ownership and legal form, etc.	(GRI 2013a; Hooks & van Staden 2011; Natural Heritage Trust 2000)
1.2 Top management commitment to environment This refers to the statements by the CEO/chairperson of the board of directors or any senior member of the management team regarding the annual reports about their obligations to environmentally related issues. It is this first impression from the management statement which will shape the readers' mindset regarding to which degree the company is committed to environmental issues.	(GRI 2013a; Natural Heritage Trust 2000)
1.3 A descriptive overview of the major environmental risks and impacts of the organisation This refers to the description of all potential dangers resulting from the organisational activities and their corresponding influence on the environment	(1993; Chatterjee & Mir 2008; Clarkson *et al.* 2008; De Villiers & Barnard 1999; GRI 2013a; Hackston & Milne 1996; Natural Heritage Trust 2000; Pahuja 2009; Smith *et al.* 2007; Suttipun & Stanton 2012a; Tilt & Symes 1999)
1.4 Establishment of environmental targets and objectives This refers to the aims set by the organisation in order to manage the environmental risks and impact and list	(Hooks & van Staden 2011; Natural Heritage Trust 2000; Pahuja 2009; Smith *et al.*

Disclosed item	Source
of measurable activities that would be performed in order to achieve the set aims.	2007; Suttipun & Stanton 2012a; Tilt & Symes 1999)
1.5 Discussion of regulations and requirements This refers to regulations from government that are related to the environment, specific to the organisations and related requirements with which to comply.	(Branco *et al.* 2008; Natural Heritage Trust 2000; Wiseman 1982)
1.6 Environmental management policies and systems This refers to a discussion of organisational environment policies such as energy and water policy and the arrangement/procedures available for environmental management.	(Branco *et al.* 2008; Hooks *et al.* 2012; Pahuja 2009; Sen *et al.* 2011; Smith *et al.* 2007; Suttipun & Stanton 2012b; Tilt & Symes 1999; Wiseman 1982)
1.7 . Environmental budget This should indicate the percentage of the organisational budget that has been allocated to environmental related activities.	(Pahuja 2009; Sen *et al.* 2011; Smith *et al.* 2007)
1.8 Environmental Management board and committees This should indicate whether the organisation has an environmental management board and committees, together with its composition of the board and the committees.	(Clarkson *et al.* 2008; Natural Heritage Trust 2000; Tilt & Symes 1999)
2. Management performance, policies and systems	
2.1. Management systems and programmes	
2.1.1. Environment management system available This refers to the adoption of an environmental management system e.g. ISO 14001 or any system developed within organisations.	(Branco *et al.* 2008; Clarkson *et al.* 2008; Natural Heritage Trust 2000; Pahuja 2009; Smith *et al.* 2007; Suttipun & Stanton 2012a; Tilt & Symes 1999)

Disclosed item	Source
2.1.2. Performance against internal policies and standards This refers to what has been achieved by the organisation compared to internal environmental policies and national and international standards.	(Natural Heritage Trust 2000; Sen *et al.* 2011; Suttipun & Stanton 2012a)
2.1.3. Environmental audits programmes (including the results of an environmental audit) This refers to the availability of environmental audit programmes and any results of an environmental audit.	(Branco *et al.* 2008; Natural Heritage Trust 2000; Pahuja 2009; Suttipun & Stanton 2012a; Tilt & Symes 1999)
2.1.4. Environmental risk management strategies This refers to the strategies set to identify, assess and prioritise the environmental risks.	(Pahuja 2009; Smith *et al.* 2007; Suttipun & Stanton 2012a)
2.1.5. Implementation of cleaner production techniques or technologies This refers to the environmental management initiatives specific to the organisation which is aimed at the sustainable use of resources such as materials, energy, water, etc**.**	(Natural Heritage Trust 2000; Sen *et al.* 2011)
2.1.6. Departments or offices for pollution control This refers to the presence of a department or offices that deals with pollution control (including the number of staff with environmental responsibilities and accountabilities).	(Clarkson *et al.* 2008; Natural Heritage Trust 2000; Wiseman 1982)
2.1.7. Environmental training and awareness programmes This refers to the existing organisational environmental program**me**s and percentage of employees trained. Any existing outreach programme on environmental issues.	(Hooks & van Staden 2011; Natural Heritage Trust 2000; Sen *et al.* 2011; Suttipun & Stanton 2012a)
2.1.8. Complaint handling procedures This refers to the procedures set by the organisation for handling environmental complaint issues.	(Natural Heritage Trust 2000)

Disclosed item	Source
2.1.9. Supporting anti-litter campaigns This refers to the organisation's involvement in supporting anti-litter campaigns in the community.	(Hackston & Milne 1996; Rouf 2011)
2.1.10. Designing facilities which are harmonious with the environment This refers to the selection; acquisition and/or design of facilities that are acceptable and environmentally friendly.	(Hackston & Milne 1996; Sen *et al.* 2011; Smith *et al.* 2007; Wiseman 1982)
2.1.11. Prevention/repair of damage to the environment This refers to prevention/repair of damage resulting from the processing of natural resources, e.g. land reclamation or reforestation.	(Branco *et al.* 2008; Hackston & Milne 1996; Pahuja 2009; Rouf 2011; Sen *et al.* 2011; Smith *et al.* 2007; Suttipun & Stanton 2012a; Tilt & Symes 1999)
2.1.12. Conservation of natural resources This refers to the use of natural resources efficiently, e.g. recycling glass, metals, oil, water and paper.	(Branco *et al.* 2008; Hackston & Milne 1996; Sen *et al.* 2011; Wiseman 1982)
2.2. Compliance requirement	
2.2.1. Penalties for non-compliance This refers to any penalties for non-compliance with national, state and local regulations or any applicable international declarations, conventions and treaties associated with environmental regulatory requirements.	(Natural Heritage Trust 2000; Pahuja 2009)
2.2.2. Environmental liabilities under applicable laws and regulations This refers to all liabilities required by laws and regulations, e.g. liabilities arising from contaminated land and water.	(De Villiers & Barnard 1999; Natural Heritage Trust 2000)
2.2.3. Litigation about environmental issues This refers to legal proceedings presented for violating environmental laws.	(De Villiers & Barnard 1999; Suttipun & Stanton 2012a; Wiseman 1982)
2.3. External recognition and activities	

Disclosed item	Source
2.3.1. Environmental achievements and awards received This refers to any environmental achievements and awards received, e.g. the award for environmental protection, the award for energy conservation, the award for greenhouse gas emission control, etc.	(Hackston & Milne 1996; Pahuja 2009; Sen *et al.* 2011; Smith *et al.* 2007; Suttipun & Stanton 2012a; Tilt & Symes 1999; Wiseman 1982)
2.4. Financial information	
2.4.1. Environmental expenditure This refers to any costs incurred in managing the environment, e.g. the cost of waste disposal or the cost associated with cleaner production measures, the purchase of pollution control equipment and facilities, the operating cost for pollution control equipment and facilities, costs incurred for training employees and communities about the environment, etc.	(De Villiers & Barnard 1999; Suttipun & Stanton 2012a; Tilt & Symes 1999; Wiseman 1982)
2.4.2. Environmental fees This refers to fees related to environmental licence fees, taxes or charges as conditions for operations.	(Natural Heritage Trust 2000)
2.4.3. Donations or grants This refers to any contribution made by organisations, e.g. donations to non-profit environmental activities such as funding for academic research or community activities such as tree planting.	(Natural Heritage Trust 2000)
2.4.4. Cost related to treatment and disposal of hazardous waste This refers to annual costs for the treatment and disposal of hazardous waste.	(Australia, 2000, De Villiers & Barnard, 1999)
2.4.5. Environmental liabilities This refers to all liabilities related to environmental remediation, e.g. liabilities associated with the sites, processes and products.	(De Villiers & Barnard 1999; Natural Heritage Trust 2000)

Disclosed item	Source
3. Environmental performance	
3.1. Energy consumption	
3.1.1. Total energy consumed per year and per unit of output	(Chu *et al.* 2012; GRI 2013a; Natural Heritage Trust 2000)
3.1.2. Total energy used from renewable sources such as water, wind, biomass and solar	(Chu *et al.* 2012; GRI 2013a; Natural Heritage Trust 2000)
3.1.3. Proportion of energy sourced from heavy fuel oil	(Chu *et al.* 2012; GRI 2013a; Natural Heritage Trust 2000)
3.1.4. Proportion of energy sourced from coal	(Chu *et al.* 2012; GRI 2013a; Natural Heritage Trust 2000)
3.1.5. Proportion of energy sourced from wood	(GRI, 2013, Australia, 2000, Chu et al., 2012)
3.1.6. Proportion of energy sourced from natural gas	(Chu *et al.* 2012; GRI 2013a; Natural Heritage Trust 2000)
3.1.7. Proportion of equipment (including office equipment and light) containing power and saving devices This refers to energy savings and the efficient use of energy in business operations.	(Australia, 2000)
3.1.8. Disclosure of energy use by facility or segment level	(Chu *et al.* 2012)
3.1.9. Comparison of energy consumption to the previous year or reduction target level	(Chu *et al.* 2012)
3.1.10. Utilising waste materials for energy production This refers to any programmes that utilise waste for the production of energy.	(Hackston & Milne 1996; United Kingdom 2012)
3.1.11. Disclosing energy saving resulting from product recycling This refers to the amount of energy saving due to the recycling of products.	(Hackston & Milne 1996)

Disclosed item	Source
3.1.12. Disclosing increased energy efficiency of products This refers to any strategies that have resulted in products with efficient energy consumption.	(Hackston & Milne 1996)
3.1.13. Research aimed at improving energy efficiency of products This refers to any research done in order to improve energy efficiency of products.	(Hackston & Milne 1996)
3.2. Water consumption	
3.2.1. Total water consumption per annum and per unit of output	(United Kingdom, 2012; (GRI 2013a)
3.2.2. Water consumed by various uses such as processing, cooling and sanitation	(United Kingdom, 2012; (GRI 2013a)
3.2.3. Total water withdrawal by source This refers to what sources of water (sources such as borehole, rain water, dam, etc.) that are used by the organisation.	(GRI 2013a; United Kingdom 2012)
3.2.4. Water sources significantly affected by withdrawal of water This refers to what source of water is highly affected in terms of the amount of water drawn, the effects on other source users, etc.	(GRI 2013a; United Kingdom 2012)
3.2.5. Total and percentage of water recycled and/or re-used	(GRI 2013a; United Kingdom 2012)
3.2.6. Total and percentage of water saved through efficiency measures	(GRI 2013a; United Kingdom 2012)
3.3. Land use and biodiversity	
3.3.1. Area of land disturbed This refers to any area/part of land which is disturbed by the organisational activities (here	(Natural Heritage Trust 2000)

Disclosed item	Source
activities such as cultivation, storage yards, etc. are considered).	
3.3.2. Area and percentage of land rehabilitated This refers to what part of the total disturbed is rehabilitated by the organisation.	(Natural Heritage Trust 2000)
3.3.3. Area of land used as buffer zones This refers to what part of area has been considered by the organisation as a buffer zone against any environmental phenomena such as floods, gales, etc.	(Natural Heritage Trust 2000)
3.3.4. Area of land subjected to dry land salinity This refers to any area of land with soil salinity due to the organisation's operation.	(Natural Heritage Trust 2000)
3.3.5. Area of land with significant erosion of topsoil This refers to any area of land with significant soil erosion due to the organisation's operations.	(Natural Heritage Trust 2000)
3.3.6. Level of habitat impacts and restoration as a result of the organisation's operation	(Natural Heritage Trust 2000)
3.4. Materials and other resources used	
3.4.1. Quantity of each type of renewable and non-renewable resource used per year and per unit of output	(GRI 2013a)
3.4.2. Quantity of toxic or hazardous substances consumed per year and per unit of output	(United Kingdom 2012)
3.4.3. Percentage of inputs saved through efficiency measures	(GRI 2013a)
3.4.4. Sources of materials used and quantity per source This refers to material sources, both locally and imported.	(United Kingdom 2012)
3.5. Emissions to effluent, waste and other emissions to the air,	

Disclosed item	Source
3.5.1. Total quantity of greenhouse gas (GHG) emissions in terms of their CO_2 equivalent per year and by unit of output	(Chu *et al.* 2012; GRI 2013a; United Kingdom 2012)
3.5.2. Disclosure of GHG emission by source (.e.g. coal, fuel, gas, etc.)	(Chu *et al.* 2012)
3.5.3. Disclosure of GHG emission by facility or by segment level	(Chu *et al.* 2012)
3.5.4. Number of days the facility exceeds the emissions per year	(Chu *et al.* 2012)
3.5.5. Comparison of GHG emission with the previous year	(Chu *et al.* 2012)
3.5.6. Description of the methodology used to calculate GHG emissions	(Chu *et al.* 2012)
3.5.7. Volume of wastewater discharged per annum and per unit of output	(United Kingdom 2012)
3.5.8. Quantity of solid waste generated per annum and per unit of output	(United Kingdom 2012)
3.5.9. Quantity of solid waste generated per annum and per unit of output	(United Kingdom 2012)
3.5.10. Type and quantity of hazardous waste generated per year and per unit of output	(United Kingdom 2012)
3.5.11. Volume of hazardous waste stored on- and off-site	(United Kingdom 2012)
3.5.12. Any waste prevention activities in place and its expected benefit	(United Kingdom, 2012)
3.5.13. Energy produced from waste	(United Kingdom, 2012)

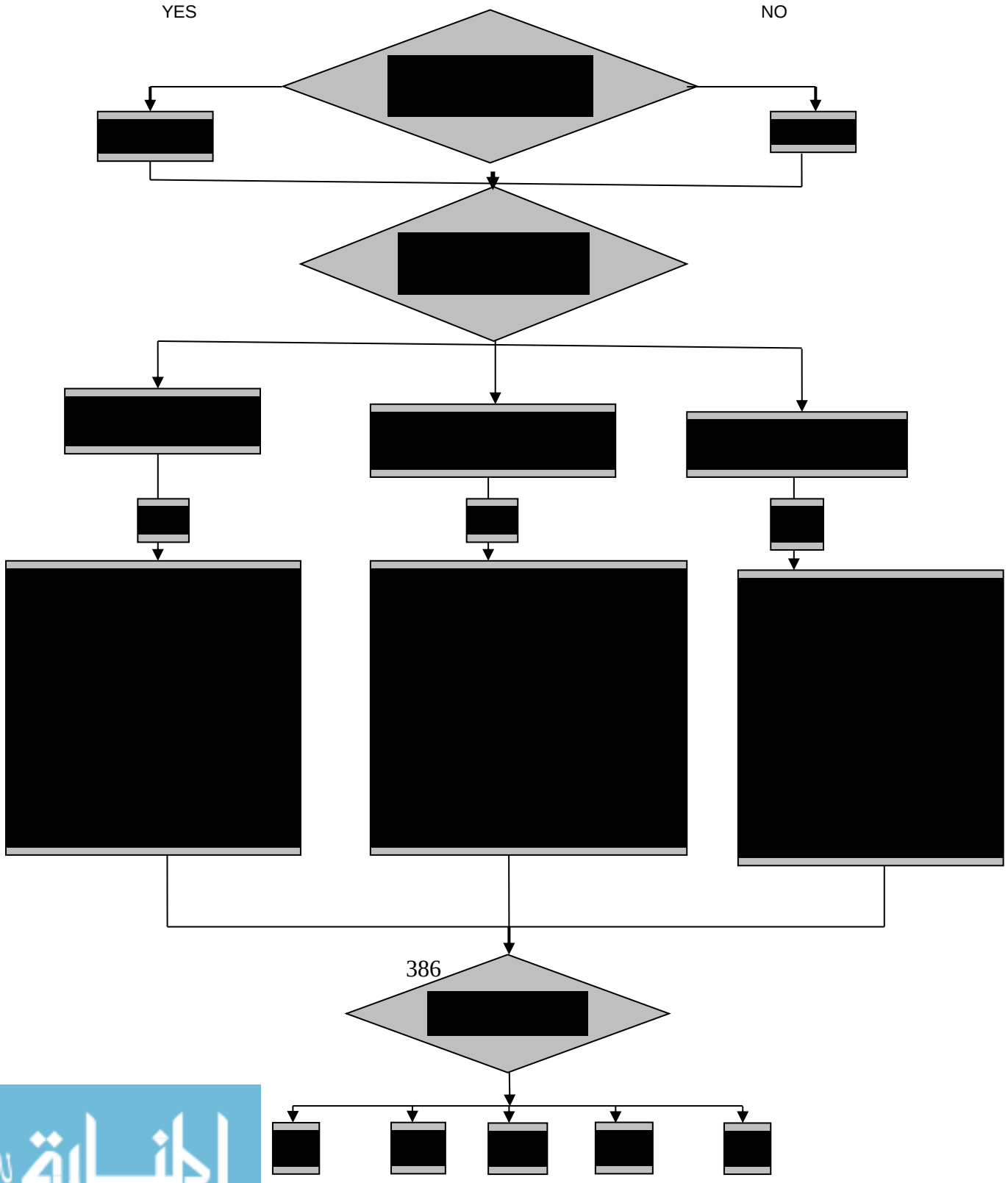
APPENDIX B

Decision rules for environmental disclosure

1. Any disclosure item that discusses or mentions the natural environmental as well as health and safety and/or their relationship to the organisation is recorded.
2. All disclosures must be explicitly stated, there cannot be implied meanings.
3. All disclosures that fit within the categories and items are to be included.
4. A disclosure having more than one possible classification or containing two or more information items are classified under each relevant category or item.
5. Pictures and graphs are not considered.

APPENDIX C

Scoring framework used to assist coding of environmental information from annual/environmental report



APPENDIX D

UNISA university of south africa

COLLEGE OF ACCOUNTING SCIENCES
RESEARCH ETHICS REVIEW COMMITTEE

Date: 6 July 2015

Ref: 2015_CAS_018
Name of applicant:
Jema Myava
Student #: 5157-818-2

Dear Ms Jema Myava,

Decision: Ethics Approval

Name: Ms Jema Myava
Mzumbe University
School of Business
P.O. Box 6
Morogoro
Tanzania
myava00@yahoo.com
Supervisor: Prof Deon Scott, (012) 429 4450, scottd@unisa.ac.za
Co-supervisor: Prof Christa Wingard, (012) 429 4013, wingahc@unisa.ac.za

Proposal: The Development of Environmental Reporting Framework for Industrial Sector in Tanzania

Qualification: Doctor of Accounting Sciences

Thank you for the application for research ethics clearance by the College of Accounting Sciences Research Ethics Review Committee for the above mentioned research. Final approval is granted for the completion of the research.

For full approval: *The application was reviewed in compliance with the Unisa Policy on Research Ethics by the College of Accounting Sciences Research Ethics Review Committee on 29 April 2015 with the resubmission reviewed on 27 May 2015.*

The proposed research may now commence with the proviso that:

1) *The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*

University of South Africa
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2) *Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the College of Accounting Sciences Research Ethics Review Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.*
3) *The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*

Note:
The reference number [top right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants, as well as with the College of Accounting Sciences RERC.

Kind regards,

Mrs Soné Beyers
(Chairperson of CAS RERC)
beyers@unisa.ac.za
(012) 429 3532

Prof Elmarie Sadler
(Executive Dean of CAS)

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
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APPENDIX E

Initial disclosure list

The disclosed item column provides the proposed items to be reported. You are requested to give your opinion (remarks column) on the items proposed, whether the item should be retained, removed or any addition of new items or information.

Disclosed item	Remarks
1. Organisational context	
1.1. Organisational profile This includes the name of the organisation, nature and type of the activities of the organisation, type of product, size of organisation, nature of ownership and legal form, etc.	
1.2. Top management commitment to environment This refers to the statements by the CEO/chairperson of the board of directors or any senior member of the management team on the annual reports about their obligations to environment-related issues. It is this first impression from the management statement which will shape the reader's mind-set on how the company is committed to environmental issues.	
1.3. A descriptive overview of the major environmental risks and impacts of the organisation This refers to the description of all potential dangers resulting from the organisational activities and their corresponding influence on the environment.	
1.4. Establishment of environmental targets and objectives This refers to the aims set by the organisation in order to manage the environmental risks and impact, and the list of measurable activities that would be performed in order to achieve the set aims.	
1.5. Discussion of regulations and requirements This refers to regulations from government that are related to the environments, specific to the organisations and the related requirements with which they must comply.	
1.6. Environmental management policies and systems This refers to the discussion of organisational environment policies, such as energy and water policies and the arrangement/procedures available for environmental management.	
1.7. Environmental budget This should indicate the percentage of the organisational budget that has been allocated to environmental related activities.	
1.8. Environmental management board and committees	

Disclosed item	Remarks
This should indicate whether the organisation has an environmental management board and committees, together with the composition of the board and the committees.	
2. Management performance, policies and systems	
2.1. Management systems and programmes	
2.1.1. Environment management system available This refers to the adoption of environmental management systems, e.g. ISO 14001, or any system developed within organisations.	
2.1.2. Performance against internal policies and standards This refers to what has been achieved by the organisation compared to internal environmental policies and national and international standards.	
2.1.3. Environmental audits programmes (including the results of the environmental audit) This refers to the availability of environmental audit programmes and any results of an environmental audit.	
2.1.4. Environmental risk management strategies This refers to the strategies set to identify, assess and prioritise the environmental risks.	
2.1.5. Implementation of cleaner production techniques or technologies This refers to the environmental management initiatives specific to the organisation, which is aimed at sustainable use of resources such as materials, energy, water, etc**.**	
2.1.6. Departments or offices for pollution control This refers to the presence of a department or offices that deal with pollution control (including the number of staff with environmental responsibilities and accountabilities).	
2.1.7. Environmental training and awareness programmes This refers to the existing organisational environmental programmes and the percentage of employees trained, as well as any existing outreach programme on environmental issues.	
2.1.8. Complaint handling procedures This refers to the procedures set by the organisation to handle environmental complaint issues.	
2.1.9. Supporting anti-litter campaigns This refers to the organisational involvement in supporting anti-litter campaigns in the community.	
2.1.10. Designing facilities harmonious with the environment This refers to the selection; acquisition and/or design of facilities that are acceptable and environmental friendly.	

Disclosed item	Remarks
2.1.11. Prevention/repair of damage to the environment This refers to prevention/repair of damage resulting from processing of natural resources, e.g. land reclamation or reforestation.	
2.1.12. Conservation of natural resources This refers to the use of natural resource efficiently, e.g. recycling glass, metals, oil, water and paper.	
2.2. Compliance requirement	
2.2.1. Penalties for non-compliance This refers to any penalties for non-compliance with national, state and local regulations or any applicable international declaration conventions and treaties associated with environmental regulatory requirements.	
2.2.2. Environmental liabilities under applicable laws and regulations This refers to all liabilities required by laws and regulations, e.g. liabilities arising from contaminated land and water.	
2.2.3. Litigation about environmental issues This refers to legal proceedings presented for violating environmental laws.	
2.3. External recognition and activities	
2.3.1. Environmental achievements and awards received This refers to any environmental achievements and awards received, e.g. award for environmental protection, award for energy conservation, award for greenhouse gas emission control, etc.	
2.4. Financial information	
2.4.1. Environmental expenditure This refers to any costs incurred for managing the environment, e.g. costs of waste disposal or cost associated with cleaner production measures, the purchase of pollution control equipment and facilities, the operating costs for pollution control equipment and facilities, costs incurred for training employees and the community about the environment, etc.	
2.4.2. Environmental fees This refers to fees related to environmental licence fees, taxes or charges as condition for operations.	
2.4.3. Donations or grants This refers to any contribution made by the organisations, e.g. donations to non-profit environmental activities such as funding for academic research or community activities such as tree planting.	
2.4.4. Costs related to treatment and disposal of hazardous waste This refers to the annual costs for the treatment and disposal of hazardous wastes.	
2.4.5. Environmental liabilities This refers to all liabilities related to environmental remediation, e.g. liabilities associated with the sites, processes and products.	

Disclosed item	Remarks
3. Environmental performance	
3.1. Energy consumption	
3.1.1. Total energy consumed per year and per unit of output	
3.1.2. Total energy used from renewable energy sources such as water ,wind, biomass and solar	
3.1.3. Proportion of energy sourced from heavy fuel oil	
3.1.4. Proportion of energy sourced from coal	
3.1.5. Proportion of energy sourced from wood	
3.1.6. Proportion of energy sourced from natural gas	
3.1.7. Proportion of equipment (including office equipment and light) containing power and saving devices This refers to energy savings and efficient use of energy in business operations.	
3.1.8. Disclosure of energy use by facility or segment level	
3.1.9. Comparison of energy consumption to the previous year or reduction target level	
3.1.10. Utilising waste materials for energy production This refers to any programmes that utilise waste for the production of energy.	
3.1.11. Disclosing energy saving resulting from product recycling This refers to the amount of energy saved due to the recycling of products.	
3.1.12. Disclosing increased energy efficiency of products This refers to any strategies that have resulted in products with efficient energy consumption.	
3.1.13. Research aimed at improving energy efficiency of product This refers to any research done in order to improve the energy efficiency of products.	
3.2. Water consumption	
3.2.1. Total water consumption per annum and per unit of output	
3.2.2. Water consumed by various uses such as processing, cooling and sanitation	
3.2.3. Total water withdrawal by source This refers to what sources of water (sources such as borehole, rain water, dam, etc.) that are used by the organisation.	
3.2.4. Water sources significantly affected by withdrawal of water This refers to what source of water is highly affected in terms of the amount of water drawn, the effects on other source users, etc.	

Disclosed item	Remarks
3.2.5. Total and percentage of water recycled and/or re-used	
3.2.6. Total and percentage of water saved through efficiency measures	
3.3. Land use and biodiversity	
3.3.1. Area of land disturbed This refers to any area/part of land which is disturbed by the organisational activities (here activities such as cultivation, storage yards, etc. are considered).	
3.3.2. Area and percentage of land rehabilitated This refers to what part of the total disturbed area is rehabilitated by the organisation.	
3.3.3. Area of land used as buffer zones This refers to what part of the area has been considered by the organisation as a buffer zone against any environmental phenomena such as floods, gales, etc.	
3.3.4. Area of land subjected to dry land salinity This refers to any area of land with soil salinity due to the organisation's operations.	
3.3.5. Area of land with significant erosion of topsoil This refers to any area of land with significant soil erosion due to the organisation's operations.	
3.3.6. Level of habitat impacts and restoration as a result of the organisation's operations.	
3.4. Materials and other resources used	
3.4.1. Quantity of each type of renewable and non-renewable resource used per year and per unit of output	
3.4.2. Quantity of toxic or hazardous substances consumed per year and per unit of output	
3.4.3. Percentage of inputs saved through efficiency measures	
3.4.4. Sources of materials used and quantity per source This refers to material sources both locally and imported.	
3.5. Emission of effluent, waste and other emissions into the air	
3.5.1. Total quantity of greenhouse gas (GHG) emissions in terms of their CO_2 equivalent per year and by unit of output	
3.5.2. Disclosure of GHG emission by source (.e.g. coal, fuel, gas, etc.)	
3.5.3. Disclosure of GHG emission by facility or by segment level	
3.5.4. Number of days the facility exceeds the emissions per year	
3.5.5. Comparison of GHG emission with the previous year	

Disclosed item	Remarks
3.5.6. Description of the methodology used to calculate GHG emissions	
3.5.7. Volume of wastewater discharged per annum and per unit of output	
3.5.8. Quantity of solid waste generated per annum and per unit of output	
3.5.9. Quantity of solid waste generated per annum and per unit of output	
3.5.10. Type and quantity of hazardous waste generated per year and per unit of output	
3.5.11. Volume of hazardous waste stored on- and off-site	
3.5.12. Any waste prevention activities in place and its expected benefit	
3.5.13. Energy produced from waste	

APPENDIX F

Results for round one of the Delphi inquiry

The table below presents the results of the response from one of the experts in round one of the Delphi inquiry. The first column presents the items proposed to be disclosed while the second column presents the opinion of the expert regarding the proposed items to be reported.

Disclosed Item	Remarks
1. Organizational context	
1.1. Organisational profile -This include name of the organization, nature and type of the activities of the organisation, type of product, size of organisation, nature of ownership and legal form etc.	Retain
1.2. Top management commitment on environment -This refers to the statements by the CEO/ chairperson of the board of directors or any senior member of the, management team on the annual reports about their obligations on environmental related issues. It is this first impression from the management statement which will shape the readers mind set on how the company is committed to environmental issues	Retain
1.3. A descriptive overview of the major environmental risks and impacts of the organisation **-**This refers to the description of all potential dangers resulting from the organization activities and their corresponding influence on the environment	Retain
1.4. Establishment of environmental targets and objectives This refers to the aims set by the organization in order to manage the environmental risks and impact and list of measurable activities that would be performed in order to achieve the set aims.	Retain
1.5. Discussion of regulations and requirements	Retain but with a clear scope as some industries have huge

Disclosed Item	Remarks
-This refers to regulations from government that are related to environment specific to the organisations and related requirements to comply with.	requirements that they have to comply with, hence this is left open; it can lead to massive amount of information
1.6. Environmental management policies and systems - This refers to discussion of organizational environment policies such as energy and water policy and the arrangement/procedures available for environmental management	Retain
1.7. . Environmental budget -This should indicate the percentage of the organisational budget that has been allocated to environmental related activities.	Retain
1.8. Environmental Management board and committees -This should indicate whether the organisation has environmental management board and committees together with its composition of the board and the committees	Retain
2. Management performance, policies and systems	
2.1. Management systems and programs	
2.1.1. Environment management system available -This refers to the adoption of environmental management system e.g. ISO 14001 or any system developed within organizations	Retain
2.1.2. Performance against internal policies and standards **-**This refers to what has been achieved by the organization against internal environmental policies and national and international standards	Retain
2.1.3. Environmental audits programs (including the results of environmental audit) **-**This refers to availability of environmental audit programs and any results of environmental audit	Retain

Disclosed Item	Remarks
2.1.4. Environmental risk management strategies -This refers to the strategies set to identify, assess and prioritize the environmental risks	Retained, but link with 1.3 to avoid duplication. Usually the said environmental dangers could be the same environmental risks
2.1.5. Implementation of cleaner production techniques or technologies -This refers to the environmental management initiatives specific to the organisation which aims at sustainable use of resources such as materials, energy, water etc**.**	Retain – but consider merging it in the areas which speaks of efficient use of energy/water etc.
2.1.6. Departments or offices for pollution control -This refers to the presence of department or offices that deals with pollution control (including the number of staff with environmental responsibilities and accountabilities)	Would rather say – Organisational structure related to the management of environmental matters
2.1.7. Environmental training and awareness programs -This refers to the existing organisational environmental programs and percentage of employees trained. Any existing outreach program on environmental issues	Retain, though not sure about the % part as it can be misleading where the organisation has got a considerable number of contract workers, a case of mining industry. Rather state the number of employees trained in a year which usually includes both permanent and temporary workers
2.1.8. Complaint handling procedures **-**This refers to the procedures set by the organization on handling environmental complaint issues	Retain. I note the work 'Grievance' is used more often nowadays
2.1.9. Supporting ant-litter campaigns -This refers to the organisation involvement in supporting ant litter campaigns in the community	Remove – the statement 'supporting ant litter campaigns in the community' assumes that those campaigns are in existence, and you are asking if the company supports those campaigns. In many

Disclosed Item	Remarks
	cases in the country, these campaigns do not exist in majority of places (at least in the places I have lived before), hence making me unsure of what is being asked here. In my view, this would be have been the question to the Government authorities to respond to.
2.1.10. Designing facilities harmonious with the environment -This refers to the selection; acquisition and or design of facilities that are acceptable and environmental friendly	Remove – In many cases majority of designs are once off things, and normally approved through EIA processes
2.1.11. Prevention/repair of damage to the environment -This refers to prevention/repair of damage resulting from processing or natural resources e.g. land reclamation or reforestation	Rather use the words - Environmental Restoration programs. I would put prevention separate to this, and ideally the sections before this are/ should all aim at prevention
2.1.12. Conservation of natural resources -This refer to the use of natural resource efficiently e.g. recycling glass, metals oil, water and paper	Retain
2.2. Compliance requirement	
2.2.1. Penalties for non-compliance This refers to any penalties for non-compliance with national, state and local regulations or any applicable international declaration conventions and treaties associated with environmental regulatory requirement	Retain
2.2.2. Environmental liabilities under applicable laws and regulations	Retain

Disclosed Item	Remarks
-This refers to all liabilities required by laws and regulations e.g. liabilities arising from contaminated land and water	
2.2.3. Litigation about environmental issues -This refers to legal proceedings present for violating environmental laws	Retain
2.3. External recognition and activities	
2.3.1. Environmental achievements and awards received -This refers to any environmental achievements and, awards received e.g. award for environmental protection, award for energy conservation, award for Greenhouse gas emission control etc.	Retain – but I would leave out the 'awards' part as this may be subjective and not necessarily reflect the actual performance on the ground. They also vary in nature and categories e.g. one may have an award on say energy conservation but on the ground they perform poorly on waste management. The awards tends to paint a good image on the surface which is not what you want in this respect
2.4. Financial information	
2.4.1. Environmental expenditure **-**This refer to any cost incurred in managing environment e.g. cost of waste disposal or cost associated with cleaner production measures, purchase of pollution control equipment and facilities, operating cost for pollution control equipment and facilities, cost incurred for training employees and community about environment etc.	Retain
2.4.2. Environmental fees - This refers to fees related to environmental licence fees, taxes or charges as condition for operations	Retain
2.4.3. Donation or grants	Retain

Disclosed Item	Remarks
-This refers to any contribution made by organisations e.g. donation to non-profit environmental activities such as funding for academic research or community activities such as tree planting)	
2.4.4. Cost related to treatment and disposal of hazardous waste This refers to annual costs for the treatment and disposal of hazardous wastes	Retain
2.4.5. Environmental liabilities -This refers to all liabilities related to environmental remediation e.g. liabilities associated with the sites, processes and product	Merge with 2.2.2. Usually companies assess their liabilities in holistic manner, taking into account the legal requirements, the state of their operation and damage made to the environment etc.
3. Environmental performance	
3.1. Energy consumption	Retain
3.1.1. Total energy consumed per year and per unit of output	Retain
3.1.2. Total energy used from renewable sources such as water, wind, biomass and solar	Retain
3.1.3. Proportion of energy sourced from heavy fuel oil	Retain
3.1.4. Proportion of energy sourced from coal	Retain
3.1.5. Proportion of energy sourced from wood	Retain
3.1.6. Proportion of energy sourced from natural gas	Retain
3.1.7. Proportion of equipment (including office equipment and light) containing power and saving devices This refers to energy savings and efficient use of energy in business operations	Retain
3.1.8. Disclosure of energy use by facility or segment level	Retain

Disclosed Item	Remarks
3.1.9. Comparison of energy consumption previous year or reduction target level	Retain
3.1.10. Utilizing waste materials for energy production - This refers to any programmes that utilise wastes for the production of energy	Retain
3.1.11. Disclosing energy saving resulting from product recycling - This refers to amount of energy saves due to recycling of products	Depending of the nature of activities, I reckon that it is not easy to quantify but would be good to know
3.1.12. Disclosing increased energy efficiency of products - This refers to any strategies that have resulted in products with efficient energy consumption	Retain
3.1.13. Research aimed at improving energy efficiency of product - This refers to any research done in order to improve energy efficiency of products	Retain
3.2. Water consumption	
3.2.1. Total water consumption per annum and per unit of output	Retain
3.2.2. Water consumed by various uses such as processing, cooling and sanitation	Retain
3.2.3. Total water withdrawal by source -This refers to what sources of water (sources such as borehole, rain water, dam, etc.) that are used by the organization	Retain
3.2.4. Water sources significantly affected by withdrawal of water -This refers to what source of water is highly affected in terms of amount of water drawn, the effects to other source users etc.	Retain

Disclosed Item	Remarks
3.2.5. Total and percentage of water recycled and/ or re-used	Retain
3.2.6. Total and percentage of water saved through efficiency measures	Retain
3.3. Land use and Biodiversity	
3.3.1. Area of land disturbed -This refers to any area/part of land which is disturbed by the organization activities (here activities such as cultivation, storage yards etc. are considered)	Retain
3.3.2. Area and percentage of land rehabilitated -Here refers to what part of the total disturbed are is rehabilitated by the organization	Retain
3.3.3. Area of land used as buffer zones -This refers to what part of area has been considered by the organization as a buffer zone against any environmental phenomena such as floods, gales etc.	Retain
3.3.4. Area of land subjected to dry land salinity -This refers to any area of land with soil salinity due to the organization's operation	Retain
3.3.5. Area of land with significant erosion of topsoil -This refers to any area of land with significant soil erosion due to the organization's operation	Retain, though I find to be subjective also
3.3.6. Level of habitat impacts and restoration as a result of organisation's operation	Subjective also
3.4. Materials and other resources used	
3.4.1. Quantity of each type of renewable and non-renewable resource used per year and per unit output	Retain but elaborate
3.4.2. Quantity of toxic or hazardous substances consumed per year and per unit output	Retain but rather measure on specific hazardous material used in the operations; as

Disclosed Item	Remarks
	critically speaking the detergents, mosquito sprays are also hazardous substances – do you want all these reported?
3.4.3. Percentage of inputs saved through efficiency measures	Instead of asking for the end results, you may want to ask for process/ operations optimisation programs – as this is where the savings are realised.
3.4.4. Sources of materials used and quantity per source -This refers to material sources both locally and imported	Didn't understand this clearly what you mean by source.
3.5. Emission to air, effluent, waste and other emissions	
3.5.1. Total quantity of greenhouse gas(GHG) emissions in terms of their co2 equivalent per year and by unit output	Retain
3.5.2. Disclosure of GHG emission by source (.e.g. Coal, fuel, gas etc.)	Retain
3.5.3. Disclosure of GHG emission by facility or by segment level	Retain
3.5.4. Number of days the facility exceeds the emissions per year	Expand to make it more specific i.e. Which groups of emissions and exceedance against what?
3.5.5. Comparison of GHG emission with the previous year	Retain
3.5.6. Description of the methodology used to calculate GHG emissions	Retain
3.5.7. Volume of wastewater discharges per annum and per unit output	Retain
3.5.8. Quantity of solid waste generated per annum and per unit output	Retain

Disclosed Item	Remarks
3.5.9. Quantity of solid waste generated per annum and per unit output	Retain – I presume one of the highlighted words was meant to be liquid?
3.5.10. Type and quantity of hazardous waste generated per year and per unit output	Retain
3.5.11. Volume of hazardous waste stored on-and off-site	Retain
3.5.12. Any waste prevention activities in place and its expected benefit	Retain
3.5.13. Energy produced from waste	Retain – but why not put this under 3.1 to retain the flow of information in the energy subject?

APPENDIX G

Second round disclosure index

The table below is the second-round disclosure index. It indicates the modified disclosure index based on experts' recommendations and is forwarded to you for your views. The first column of the table indicates the proposed disclosure items. The second column indicates your remarks from round one. The third column indicates what other experts have recommended. You are now requested to give your opinion (use the last column, the remarks column) whether you agree or do not agree with what other experts have recommended (in case that their remarks were different from yours). Reasons for not agreeing should be given.

Please note that, if you sought for any clarification during round one, the response to the clarification has been provided under your remark's column, against each item.

Disclosed Item	Your Remarks	Remarks from others	Remarks
1 Organisational context			
1.1 Organisational profile This includes the name of the organisation, nature and type of the activities of the organisation, type of product, size of organisation, nature of ownership and legal form, etc.	Retain	Add relevant permits and licences (this means that the organisation should disclose in order for it to operate, what license and/or permit they do have).	
		Add mission and vision of the organisation.	
		Add date that the organisation started its operations.	
1.2. Top management commitment to the environment This refers to the statements by the CEO/chairperson of the board of directors or any senior member of the management team in the	Retain	In this case if CEO is for the group of companies, then the senior member of the management team should be the Managing Director or General Manager.	

Disclosed Item	Your Remarks	Remarks from others	Remarks
annual reports about their obligations to environment-related issues. It is this first impression from the management statement which will shape the reader's mind-set on how the company is committed to environmental issues.		The CEO should define environmental policy clearly. There must be a commitment to continuous improvement and prevention of pollution.	
		Provide the framework for setting and reviewing environmental objectives and targets and communicated to all people working for or on behalf of the organisation.	
		Commitment to comply with applicable legal requirements and with other requirements to which the organisation subscribes which relate to its environmental aspects.	
		Statement by the Minister to be added for the governmental institution.	
		It should include information on the availability of an environmental policy.	
1.3. A descriptive overview of the major environmental risks and impacts of the organisation This refers to the description of all potential dangers resulting from the organisational activities and their corresponding	Retain	**(**suggest that the heading be improved to read: "A descriptive overview of the major environmental risks and its impact to the organisational activities")	
		This section should be removed, no company is	

Disclosed Item	Your Remarks	Remarks from others	Remarks
influence on the environment.		ready to disclose their negative information	
		Include a description of the production line/steps and associated risks.	
		Consider life cycle perspective as addressed in the new standard ISO 14001:2015.	
		Explain the effect of the environment on the organisation as addressed in the new standard.	
		The details should include the environmental aspects of its activities, products and services and within the scope of the environmental management system that it can control and those that it can influence taking into account planned or new developments, or new modified activities, products, as well as aspects that have significant impact(s) on the environment.	
		Emergency preparedness should be stated clearly.	
1.4. Establishment of environmental targets and objectives	Retain	Refine the details to read "Refers to the set organisational goals intended to be achieved in the specified timeframe in order to manage	

Disclosed Item	Your Remarks	Remarks from others	Remarks
This refers to the aims set by the organisation in order to manage the environmental risks and impact and list of measurable activities that would be performed in order to achieve the set aims.		environmental risks associated with the activities performed by the organisation. In each goal detailed activities are also depicted and they are the ones used to measure whether there is goal fulfilment or not."	
		The targets should be compared with the national standards or international standards in the case of no national standards available.	
1.5. Discussion of regulations and requirements This refers to regulations from government that are related to the environment specific to the organisations and related requirements with which to comply.	Retain but with a clear scope as some industries have huge requirements with which they have to comply, hence, if this is left open, it can lead to massive amounts of information.	**Title should read** "Environmental Regulations and Requirements")	
		Modify the details to read "This refers to regulations from NEMC that are related to the environments specific to the organisations and related requirements with which to comply."	
		The discussion should cover Environmental Policy (1997), EMA (2004), Environmental Regulations (as well as international requirements).	
		1.5 Should read: "Policy, laws and regulations".	

Disclosed Item	Your Remarks	Remarks from others	Remarks
		Some of the issues are not addressed at the national level, but international standards can also be referred to, especially for multinational companies.	
1.6. Environmental management policies and systems This refers to a discussion of organisational environment policies such as energy and water policy and the arrangement/procedures available for environmental management.	Retain	Environmental policy should be separated from energy and water policies.	
		I suggest organisational environmental policy to be moved to section 1.2.	
		Company environmental policy, health and safety policy be included.	
		Clearly stated commitment of the organisation to protecting the environment and Substantiation of resources by other available alternatives to be stated.	
		The item should be retained, but with emphasis on the relevant policies rather than simply making reference to ~~energy and water policies.~~ The title should read: "Environmental policies and institutional framework".	
		The discussion should include organisational	

Disclosed Item	Your Remarks	Remarks from others	Remarks
		environmental policy, health and safety policy. The title should read: "Environmental management procedures".	
		Organisational environmental policy to be included in section 6.2.1.2.	
1.7. Environmental budget This should indicate the percentage of the organisational budget that has been allocated to environment-related activities.	Retain	The title should read "**Environmental management budget".**	
		The budget should be itemised in each area as defined in the policy in section 1.6.	
1.8. Environmental Management board and committees This should indicate whether the organisation has an environmental management board and committees, together with the composition of the board and the committees.	Retain	Merge the item with item 6.2.1.2.	
		The role of the board and committees should also be stated in the report.	
		The section is not necessary, and should be deleted.	
		Indicate the seniority of chairs of the committees and how these committees report to the board.	
		I suggest emphasis should be on "environmental structure" rather than "environmental board".	

Disclosed Item	Your Remarks	Remarks from others	Remarks
2. Management performance, policies and systems			
2.1. Management systems and programmes			
2.1.1. Environment management system available This refers to the adoption of an environmental management system, e.g. ISO 14001, or any system developed within organisations.	Retain	If not in place, information on the effort to adopt the same should be given.	
2.1.2. Performance against internal policies and standards This refers to what has been achieved by the organisation against internal environmental policies and national and international standards.	Retain	I suggest that we break this heading into two parts: (1) <u>Performance against set standards and requirements</u> This measures the level of achievement of the organisation in implementing all environmentally related activities. It shows the extent to which the organisation has managed to meet its goals. (2) <u>Adherence to the internal policies</u> This shows the extent to which the organisation has managed to implement its activities as per the set requirements in the internal policies of the organisation.	

Disclosed Item	Your Remarks	Remarks from others	Remarks
		The heading should change to: "**Performance against developed internal procedures, legal requirements and standards".**	
2.1.3. Environmental audit programmes (including the results of environmental audit) This refers to the availability of environmental audit programmes and any results of environmental audits.	Retain	Heading should read: "**Environmental monitoring and audits programmes (including the results of environmental audit").**	
2.1.4. Environmental risk management strategies This refers to the strategies set to identify, assess and prioritise the environmental risks	Retained, but link with 1.3 to avoid duplication. Usually the said environmental dangers could be the same environmental risks. 1.3 just explains the environmental risk related to organisational activities, but sect 2.1.4 measures the performance on how they manage environmental risks related to the organisational activities.	Retain, although for many organisations they will find it difficult to do.	
		Should also cover risk assessment, i.e. risk assessment and risk management.	
		Environmental job safety analysis, measures to be taken in case of any environmental risk (i.e. spills kits). The item should not overlap with item 6.2.1.3.	
2.1.5. Implementation of cleaner production techniques or technologies	Retain, but consider merging it in the areas which speaks	Can be retained, particularly when the control is set at each stage	

Disclosed Item	Your Remarks	Remarks from others	Remarks
This refers to the environmental management initiatives specific to the organisation, which is aimed at the sustainable use of resources such as materials, energy, water, etc.	of efficient use of energy/water, etc.	of the life cycle of the product.	
		also consider: Promotion of cleaner technologies for government institutions	
2.1.6. Departments or offices for pollution control This refers to the presence of department or offices that deals with pollution control (including the number of staff with environmental responsibilities and accountabilities).	Would rather say: "Organisational structure related to the management of environmental matters".	It should read: "Department for environmental management".	
		It should read: "Institutional arrangement for environmental management".	
		Remove	
		If not available, could discuss which department handles the same.	
		Add staff qualification or experience in the field.	
2.1.7. Environmental training and awareness programmes This refers to the existing organisational environmental programmes and percentage of employees trained. Any existing outreach programme on environmental issues.	Retain, though not sure about the % part as it can be misleading where the organisation has got a considerable number of contract workers, as in the case of the mining industry. Rather state the number of employees trained in a year which usually includes both	Retain	

Disclosed Item	Your Remarks	Remarks from others	Remarks
	permanent and temporary workers.		
2.1.8. Complaint handling procedures This refers to the procedures set by the organisation for handling environmental complaint issues.	Retain. I note the word 'Grievance' is used more often nowadays.	This may be one of the procedures developed under Part 2.1.2.	
2.1.9. Supporting anti-litter campaigns This refers to the organisational involvement in supporting anti-litter campaigns in the community.	Remove. The statement 'Supporting anti-litter campaigns in the community' assumes that those campaigns are in existence, and you are asking if the company supports those campaigns. In many cases in the country, these campaigns do not exist in the majority of places (at least in the places I have lived before), hence making me unsure of what is being asked here. In my view, this would have been the question to which the Government authorities should respond.	**The heading should read: "Supporting environmental protection campaigns".**	
		I am not sure for this one	
		Can be deleted. Once all other measure listed are implemented this will covered	
		The Company should report not only on litter, but on the general social responsibility (its general support to the surrounding community).	
2.1.10. Designing facilities harmonious with the environment	Remove. In many cases the majority of designs are once-off things, and normally	Retain	

Disclosed Item	Your Remarks	Remarks from others	Remarks
This refers to the selection; acquisition and or design of facilities that are acceptable and environmental friendly	approved through EIA processes. I think this should remain because the purpose of this framework is to enable organisations to report environmental issues in their annual report which is directly available to their stakeholders. I agree that similar information may be reported somewhere else by the organisation, e.g. EIA report submitted to NEMC.		
2.1.11. Prevention/repair of damage to the environment This refers to prevention/repair of damage resulting from processing of natural resources, e.g. land reclamation or reforestation.	Rather use the words "Environmental Restoration programmes". I would put prevention separately to this, and ideally the sections before this are/should all aim at prevention. - I agree.	Retain	
2.1.12. Conservation of natural resources This refers to the use of natural resource efficiently e.g. recycling glass, metals, oil, water and paper.	Retain	Can be shifted to section 2.1.10.	
		Can be deleted. Or merge with 2.1.5.	

Disclosed Item	Your Remarks	Remarks from others	Remarks
2.1.13 Environmental information disclosure This refers to the commitment of the company to disclose environmental information within and outside organisation through appropriate media.		This is suggested to be added (suggested by other experts).	
2.2. Compliance requirement			
2.2.1 Penalties for non-compliance This refers to any penalties for non-compliance with national, state and local regulations or any applicable international declaration conventions and treaties associated with environmental regulatory requirements.	Retain	"Polluter pay" principle should be applied for non-compliance with environment management.	
		The report should specify when the penalties were issued, e.g. within the reporting period.	
		The action taken to rectify the non-compliancy.	
2.2.2 Environmental liabilities under applicable laws and regulations This refers to all liabilities required by laws and regulations, e.g. liabilities arising from contaminated land and water.	Retain	Retain	
2.2.3 Litigation about environmental issues This refers to legal proceedings present for violating environmental laws	Retain	Not necessary to report this item	
		The information is already contained in section 6.2.2.2.1.	

Disclosed Item	Your Remarks	Remarks from others	Remarks
2.3 External recognition and activities			
2.3.1 Environmental achievements and awards received This refers to any environmental achievements and awards received, e.g. award for environmental protection, award for energy conservation, award for greenhouse gas emission control, environmental championship/recognition award, etc.	Retain, but I would leave out the 'awards' part as this may be subjective and may not necessarily reflect the actual performance on the ground. They also vary in nature and categories, e.g. one may have an award on, say, energy conservation, but on the ground they perform poorly on waste management. The awards tend to create a good image on the surface which is not what you want in this respect. (I agree and this is among the challenges with voluntary reporting. However, for the proposed framework, any other weaknesses will also be disclosed in other sections, hence the reader will be able to read both the strengths and weaknesses.)	Retain	
2.4 Financial information			

Disclosed Item	Your Remarks	Remarks from others	Remarks
2.4.1 Environmental expenditure This refers to any costs incurred in managing the environment, e.g. the cost of waste disposal or the cost associated with cleaner production measures, purchase of pollution control equipment and facilities, operating cost for pollution control equipment and facilities, cost incurred for training employees and the community about the environment, etc.	Retain	Retain	
2.4.2 Environmental fees This refers to fees related to environmental licence fees, taxes or charges as conditions for operations.	Retain	Retain	
Environmental incidences This refers to cost incurred related to environmental incidents.		This is a newly suggested section	
2.4.3 Donation or grants This refers to any contributions made by organisations, e.g. donations to non-profit environmental activities such as funding for academic research or community activities such as tree planting.	Retain	This should be termed as 'corporate social responsibility (CSR)'. This could include supporting students' environmental clubs.	
~~**2.4.4 Cost related to treatment and**~~	Retain	Deleted, included in 2.4.1	

Disclosed Item	Your Remarks	Remarks from others	Remarks
~~**disposal of hazardous waste**~~ ~~This refers to annual costs for the treatment , storage and disposal of hazardous wastes~~			
2.4.5 Environmental liabilities This refers to costs related to all liabilities related to environmental remediation, e.g. liabilities associated with the sites, processes and products.	Merge with 2.2.2. Usually companies assess their liabilities in holistic manner, taking into account the legal requirements, the state of their operations and damage done to the environment, etc. This section was meant to discuss the costs incurred as a result of compliance in section 2.2.2. See corrections in section 2.4.5)	Retain	
3 Environmental performance			
3.1 Energy consumption	Retain	The title should read "Energy source, unit demand and consumption".	
3.1.1 Total energy consumed per year and per unit of output	Retain	Retain	
3.1.2 Total energy used from renewable sources such as water, wind, biomass and solar	Retain	Retain	
3.1.3 Proportion of energy sourced from heavy fuel oil	Retain	How about combining all these under one heading. I	

Disclosed Item	Your Remarks	Remarks from others	Remarks
		propose it to be “Use of energy from non-renewable sources”. This refers to non-renewable energy sources and their proportions such as fuel oil, coal, wood and natural gas.	
3.1.4 Proportion of energy sourced from coal	Retain	retain	
3.1.5 Proportion of energy sourced from wood	Retain	retain	
3.1.6 Proportion of energy sourced from natural gas	Retain	retain	
3.1.7 Proportion of equipment (including office equipment and light) containing power and saving devices This refers to energy savings and efficient use of energy in business operations.	Retain	Need energy audit to be carried out.	
3.1.8 Disclosure of energy use by facility or segment level	Retain	Need energy audit to be carried out.	
3.1.9 Comparison to the previous year of energy consumption or reduction target level	Retain	retain	
3.1.10 Utilising waste materials for energy production This refers to any programmes that utilise waste for the production of energy.	Retain	retain	

Disclosed Item	Your Remarks	Remarks from others	Remarks
3.1.11 Disclosing energy saving resulting from product recycling This refers to the amount of energy saved due to recycling of products.		retain	
3.1.12 Disclosing increased energy efficiency of products This refers to any strategies that have resulted in products with efficient energy consumption.	Retain	Retain	
3.1.13 Research aimed at improving energy efficiency of products This refers to any research done in order to improve energy efficiency of products.	Retain	Retain	
3.1.14 System energy balance analysis This refers an indication of what comes in, the consumption and how much is dissipated in terms of energy.		This is suggested to be added.	
3.2 Water consumption		It should read "Water source, unit demand and consumption".	
Water abstraction, use and discharge permit		This is suggested to be added.	
3.2.1 Total water consumption per annum and per unit of output	Retain	Retain	

Disclosed Item	Your Remarks	Remarks from others	Remarks
3.2.2 Water consumed by various uses such as processing, cooling and sanitation	Retain	Retain	
3.2.3 Total water withdrawal by source This refers to what sources of water (sources such as borehole, rain water, dam, etc.) that are used by the organisation.	Retain	Heading should read total water abstraction by source	
3.2.4 Water sources significantly affected by withdrawal of water This refers to what source of water is highly affected in terms of amount of water drawn, the effects on other source users, etc.	Retain	Retain	
3.2.5 Total and percentage of water recycled and/or re-used	Retain	Retain	
3.2.6 Total and percentage of water saved through efficiency measures	Retain	Retain	
Water balance analysis This refers to the volume of water abstracted, stored onsite, consumed and lost through natural events such as seepage into the ground and evaporation.		This is suggested to be added	
Waste water treatment technology in place		Newly suggested item	

Disclosed Item	Your Remarks	Remarks from others	Remarks
3.3 Land use and biodiversity		**It should read "Land use and biodiversity, and sensitive areas".**	
3.3.1 Area of land disturbed This refers to any area/part of land which is disturbed by the organisational activities (activities such as cultivation, storage yards, etc. are considered).	Retain	It should read "Area of land disturbed/cleared".	
3.3.2 Area and percentage of land rehabilitated This refers to what part of the total disturbed area is rehabilitated by the organisation.	Retain	retain	
3.3.3 Area of land used as buffer zones This refers to what part of area has been considered by the organisation as a buffer zone against any environmental phenomena such as floods, gales, etc.	Retain	retain	
3.3.4 Area of land subjected to dry land salinity This refers to any area of land with soil salinity, heavy metals, etc. due to the organisational operations, area of land with	Retain	retain	
3.3.5 Area of land with significant erosion of topsoil This refers to any area of land with significant soil erosion due	Retain, though I also find it to be subjective.	retain	

Disclosed Item	Your Remarks	Remarks from others	Remarks
to the organisational operations.			
3.3.6 Level of habitat impacts and restoration as a result of organisational operations	Also subjective	retain	
3.3.7 Posting rehabilitation bonds (in the case of mining projects)		Newly suggested item	
3.3.8 Involvement of the community in rehabilitation activities		Newly suggested item	
Materials and other resources used			
3.3.9 Quantity of each type of renewable and non-renewable resource used per year and per unit of output This refers to the weight or volume of materials that are used to produce the primary product of the organisation during the reporting period.	Retain but elaborate-	Retain	
3.3.10 Type and quantity of toxic or hazardous substances consumed per year and per unit of output	Retain, but rather measure the specific hazardous material used in the operations, as critically speaking, the detergents and mosquito sprays are also hazardous substances. Do you want all these reported?-only hazardous materials specific to the	The item should extend to include type of toxic or hazardous substance and its disposal method	

Disclosed Item	Your Remarks	Remarks from others	Remarks
	organisational operations.		
3.3.11 Percentage of inputs saved through efficiency measures	Instead of asking for the end results, you may want to ask for process/operations optimisation programmes, as this is where the savings are realised. (I feel this has been covered by section 3.1.)	Retain	
3.3.12 Sources of materials used and quantity per source This refers to material sources both locally produced and imported.	I did not understand this clearly. What you mean by "source"/. Source means from where the organisation gets its raw materials.	Retain	
3.4 Emission of effluent, waste and other emissions into the air			
3.4.1 Total quantity of greenhouse gas (GHG) emissions in terms of their CO_2 equivalent per year and by unit of output	Retain	This may need guidance as most organisations do not measure CO_2 emissions.	
3.4.2 Disclosure of GHG emission by source (.e.g. Coal, fuel, gas etc.)	Retain	This may need guidance.	
3.4.3 Disclosure of GHG emission by facility or by segment level	Retain	This may need guidance.	
3.4.4 Number of days the facility	Expand to make it more specific. Which	Retain	

Disclosed Item	Your Remarks	Remarks from others	Remarks
exceeds the emissions per year (based on NEMC and other international standards which has been ratified by Tanzanian government)	groups of emissions and exceedance against what?		
3.4.5 Comparison of GHG emissions with the previous year	Retain	This may need guidance.	
3.4.6 Description of the methodology used to calculate GHG emissions	Retain	This may need guidance.	
3.4.7 Volume of waste water discharged per annum and per unit of output	Retain	Retain	
3.4.8 Quantity of solid waste generated per annum and per unit of output	Retain – I presume one of the highlighted words was meant to be liquid? No, it was not for liquid, it is a repetition and the duplication is now removed.	Retain	
3.4.9 Type and quantity of hazardous waste generated per year and per unit of output	Retain	Retain	
3.4.10 Volume of hazardous	Retain	Include treatment cost and disposal cost.	Disagree

Disclosed Item	Your Remarks	Remarks from others	Remarks
waste stored on-and off-site			
3.4.11 Internal waste handling procedures (collection, sorting and disposal)		newly suggested item	
3.4.12 Any waste prevention activities in place and its expected benefit	Retain	Retain	
~~**3.4.13**~~			

APPENDIX H

Results for second round of the Delphi inquiry-.

The table below indicates the results for second round of the Delphi inquiry from one expert. The first column of the table indicates the proposed disclosure items. The second column indicates expert remarks from round one. The third column indicates what other experts have recommended. Fourth column indicates the expert opinion regarding the remarks from others

¤ **Disclosed Item**	**Your Remarks**	**Remarks from others**	**Remarks**
1. Organisational context			
1.1 Organisational profile This includes the name of the organisation, nature and type of the activities of the organisation, type of product, size of organisation, nature of ownership and legal form, etc.	Agreed. But it also includes the status of the organisation in the society.	Add relevant permits and licences (this means that the organisation should disclose in order for it to operate, what license and/or permit do they have).	Disagreed. Relevant permits and licenses are not necessary for showing the organisational profile.
		Add mission and vision of the organisation.	Agreed
		Add the date that the organisation started its operations.	Agreed
1.2. Top management commitment on environment This refers to the statements by the CEO/chairperson of the board of directors or any senior member of the management team in the annual reports about their obligations to environmental issues. It is this	Agreed, but this one can also be seen from another perspective as well. In the case of the government institutions that commitment has	In this case that it is the CEO of the group of companies, then the senior member of the management team should be the Managing Director	Disagreed with the given remark. It is not clearly stated what it means and the aim is.

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
first impression from the management statement which will shape the readers' mind-set on how committed the company is to environmental issues.	to be depicted by the Accounting Officer i.e. Permanent Secretary, CEO, and Managing Directors, etc. Also, it has to be reflected in the Strategic Plan (5-Year Plan) of the organisation, which later on translated into the Medium Term Expenditure Framework for the purpose of funding. Another important aspect to note is that there are some organisational internal policies. Therefore, this kind of commitment can be depicted there as well.	or General Manager.	
		The CEO should define the Environmental Policy clearly, as well as the commitment to continuous improvement and prevention of pollution.	Agreed
		Provide the framework for setting and reviewing environmental objectives and targets, and communicate it to all the people working for or on behalf of the organisation.	Agreed
		Commitment to comply with applicable legal requirements and with other requirements to which the organisation subscribes, which relate to	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
		environmental aspects.	
		Statement by the Minister to be added for governmental institutions.	Agreed
		It should include information on availability of an environmental policy.	Agreed
1.3. A descriptive overview of the major environmental risks and impacts of the organisation This refers to the description of all potential dangers resulting from the organisational activities and their corresponding influence on the environment. -	I suggest that the heading be improved to read: "*A descriptive overview of the major environmental risks and its impact to the organisational activities*". This provides descriptions of the major environmental risks, both internally and externally influenced, associated with	- This section should be removed, no company is ready to disclose their negative information	Disagree. This section cannot be removed since it communicates critical issues regarding risks and associated effects
		Include a description of the production line/steps and associated risks	Agreed
		Consider the life cycle perspective as addressed in the new standard, ISO 14001:2015.	Not so sure

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
	the activities performed by the organisation and its impact on the ability of the organisation to meet its set targets and objectives.	Explain the effect of the environment on the organisation as addressed in the new standard.	Agreed
		The details should include environmental aspects of its activities, products and services and within the scope of the environmental management system that it can control, and those that it can influence taking into account planned or new developments, or new modified activities, products, and aspects that have, or have significant, impact(s) on the environment.	
		Emergency preparedness should be stated clearly.	Agreed
1.4. Establishment of environmental targets and objectives This refers to the aims set by the organisation in order to manage the environmental	Agreed. But it can be refined as follows: "Refers to the set organisational	The targets should be compared with the national or international standards, in case	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
risks and impact and a list of measurable activities that would be performed in order to achieve the set aims.	goals intended to be achieved in a specified timeframe in order to manage environmental risks associated with the activities performed by the organisation. For each goal detailed activities are also depicted and they are the ones used to measure whether there is goal fulfilment or not".	of no national standards.	
1.5. Discussion of regulations and requirements This refers to regulations from government that are related to the environment specific to the organisations and related requirements with which to comply.	I suggest that we improve the heading to read: "*Environmental Regulations and Requirements*" Environmental Regulations are set by the government. They provide details of the requirements on various areas. The regulations are the extensions of the Act which is normally passed by the Parliament. Regulations ought to address all issues	Modify the details to read "This refers to regulations from NEMC that are related to the environment specific to the organisations, and related requirements with which to comply".	Not agreed. I think the one I proposed is more comprehensive
		The discussion should cover Environmental Policy (1997) → EMA (2004) → Environmental Regulations (as well as international requirements).	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
	covered in the Act. Therefore, in the case of the environment the hierarchy is as follows: Environmental Policy (1997) → EMA (2004) → Environmental Regulations.	1.5 should read "Policy, laws and regulations".	Not agreed.
		Some of the issues are not addressed at national level, but international standards can also be referred to, especially for multinational companies.	Not agreed
1.6. Environmental management policies and systems This refers to a discussion of organisational environment policies, such as energy and water policies and the arrangement/procedures available for environmental management.	These are the policies set by the government to manage all environment-related issues in the country. The policy indicates the main objective for managing the environment, key actors, their roles and responsibilities, source of funds for environment-related matters and how various government institutions are going to coordinate their work. In this case, it provides a clear link between the	The title should read: "Environmental policies and institutional framework".	Agreed
		Environmental policy should be separated from energy, water policies.	Agreed
		The title should read: "Environmental management procedure".	No
		I suggest organisational environment policy to be moved to section 1.2.	No

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
	division of roles and the means of coordination of various sectors such as water, forestry, agriculture, transport, etc. An environmental management system is the framework which consists of policies, legislation (act and regulations), key players, their roles and responsibilities, reporting structure and mechanisms for monitoring and evaluation of environment-related matters.	Company environmental policy, health and safety policy be included.	No
		A clearly stated commitment of the organisation for protecting the environment and substation of resources with other available alternatives to be stated.	Agreed
		The item should be retained, but with emphasis on the relevant policies, rather than simply making reference to energy and water policies.	Agreed
1.7. Environmental budget This should indicate the percentage of the organisational budget that has been allocated to environment-related activities.	Environmental budget: this is the budget set aside by the organisation to be used for implementing all activities related to the	The title should read: "**Environment management budget"**	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
	environment in the organisation. It can be a percentage of the total budget of the organisation or a budget set according to the line activity of the organisation.	The budget should be itemised in each area as defined in the policy in section 1.6	Not clear, hence I disagree.
1.8. Environmental management board and committees This should indicate whether the organisation has an environmental management board and committees, together with the composition of the board and the committees.	These are the board and committees formed by the Accounting Officer or CEO in order to oversee all matters related to the environment in the organisation. Normally, they are expected to meet at least once every quarter to deliberate on various issues such as environment management plans, their implementation status, follow-up, sanctioning environmental defaulters within the organisations, etc.	Merge with 1.2.	Disagree
		The role of the board and committees should also be stated in the report.	Agreed
		The section is not necessary, should be deleted.	Disagree
2. Management performance, policies and systems			
2.2. Management systems and programmes			

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
2.2.1. Environment management system available This refers to the adoption of an environmental management system, e.g. ISO 14001, or any system developed within organisations.	These are systems set up by the organisations in order to address or manage environmental challenges facing the organisations. The system can either be tailored to suit the particular organisation or make use of the system designed by known internationally accredited organisations such as ISO.	If not in place, information on the effort to adopt the same should be given.	Disagreed. It is verge remarks.
2.2.2. Performance against internal policies and standards This refers to what has been achieved by the organisation measured against internal environmental policies and national and international standards.	I suggest that we break this heading into two parts: (1) Performance against set standards and requirements This measures the level of achievement of the organisation in implementing all environment-related activities. It shows the extent to which the organisation has managed to meet its goals.	The heading should be: "**Performance against developed internal procedures, legal requirements and standards".**	Agreed, but it has to be shortened to read: **"*Performance against legal requirements and standards*".**

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
	(2) Adherence to the internal policies This shows the extent to which the organisation has managed to implement its activities as per the set requirements in the internal policies of the organisation.		
2.2.3. Environmental audit programmes (including the results of the environmental audit) This refers to the availability of environmental audit programmes and any results of an environmental audit.	I suggest that we break this heading into two parts: (1) Environmental audit This is an audit conducted by a registered environmental auditor with an intention of establishing whether the organisation is complying with the environmental policies, laws, regulations and other related requirements. It is conducted by an independent registered environmental auditor. (2) Environmental	Heading should read: "**Environmental monitoring and audits programmes (including the results of environmental audit).**	Disagree. ***Environmental monitoring*** and ***Environmental audit*** are two different issues.

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
	audit programme This shows the plan according to which the environmental auditor is going to conduct his/her environmental audit. It includes the objective of the audit, activities to be performed, methods to be used during the audit, timelines for the audit and the names of the auditors concerned. It is developed by auditors themselves and it is specific for each audit.		
2.2.4. Environmental risk management strategies This refers to the strategies set to identify, assess and prioritise the environmental risks.	Agreed	Retain although many organisations will find it difficult to do.	Agree
		Should also cover risk assessment, i.e. risk assessment and risk management.	Agree
		Environmental job safety analysis, measures to be taken in case of any environmental	Agree

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
		risk (e.g. spills kits).	
2.2.5. Implementation of cleaner production techniques or technologies This refers to the environmental management initiatives specific to the organisation which aims at sustainable use of resources such as materials, energy, water, etc**.**	This refers to the organisation's environmental management initiatives specifically geared towards implementing its activities by using techniques, methods and inputs/materials that are not detrimental to the environment.	Can be retained particularly when the control is set at each stage of the life cycle of the product.	This remark is not clear
		Also consider the promotion of cleaner technologies for government institutions	Agree
		Consider merging it in the areas which speak of the efficient use of energy, water, etc.	Disagree
2.2.6. Departments or offices for pollution control This refers to the presence of departments or offices that deal with pollution control (including the number of staff with environmental responsibilities and accountabilities).	Agreed	It should read: "Department for environmental management".	Agree
		Remove	Disagree. This is a very important office.
		If not available, could discuss which department handles the same.	Disagree
		Add staff qualification or experience in the field.	Disagree

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
		Would rather say: "Organisational structure related to the management of environmental matters".	Disagree
2.2.7. Environmental training and awareness programmes This refers to the existing organisational environmental programmes and the percentage of employees trained. Also any existing outreach programme on environmental issues.	This refers to the organisational environmental programmes which show the environmental training needs, the target groups, type of the course or training intervention per target group, timelines for the implementation of various training activities, etc. It might cover employee and other key stakeholders necessary for ensuring that environment is protected.	Retain, though not sure about the % part as it can be misleading where the organisation has got a considerable number of contract workers, which is the case for the mining industry. Rather state the number of employees trained in a year which usually includes both permanent and temporary workers.	Disagree. Even the contract staff ought to be aware of environment-related matters and their effects.
2.2.8. Complaint handling procedures This refers to the procedures set by the organisation for handling environmental complaint issues.	Agreed	This may be one of the procedures developed under Part 2.1.2.	Disagree
		Retain. I note the word "Grievance" is used more often nowadays.	Agree, but the word grievance has not been used here. Rather the word "Complaint" is the one used in this specific part.

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
2.2.9. Supporting anti-litter campaigns This refers to the organisational involvement in supporting anti-litter campaigns in the community.	Agreed	The heading should read: "**Supporting environmental protection campaigns".**	Agreed
		I am not sure about this one.	
		Can be deleted. Once all other measures listed are implemented, this will be covered.	Disagree. This is a continuous process/activity.
		The Company should report not only on litter, but on the general social responsibility (its general support to the surrounding community).	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
		Remove. The statement "supporting anti-litter campaigns in the community" assumes that those campaigns are in existence, and you are asking if the company supports those campaigns. In many cases in the country, these campaigns do not exist in the majority of places (at least in the places I have lived before), hence making me unsure of what is being asked here. In my view, this would have been the question for the government authorities to respond to.	Disagree
2.2.10 Designing facilities harmonious with the environment This refers to the selection, acquisition and/or design of facilities that are acceptable and environmentally friendly.	Agreed	Retain	Agreed
2.2.11. Prevention/repair of damage to the environment This refers to prevention/repair of damage resulting from	Agreed. But we need to add the word "Extraction".	Rather use the words "Environment restoration	Disagreed. Changing it to "Restoration" will only address one aspect of repair and leave aside an

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
processing or natural resources e.g. land reclamation or reforestation	This refers to the prevention/repair of damage resulting from processing or extraction of natural resources. These are activities such as land reclamation, reforestation, mining rehabilitation, etc.	programmes". I would put prevention separate from this, and ideally the sections before this should all aim at prevention.	important part of prevention.
2.2.12 Conservation of natural resources This refers to the use of natural resource efficiently, e.g. recycling glass, metals, oil, water and paper.	This refers to the efficient use of natural resources and its products i.e. recycling glass and plastic products, paper, metals, oil, natural gas, water, etc.	Can be shifted to section 2.1.10	Disagree
		Can be deleted or merged with 2.1.5.	Disagree
2.2.13 Environmental information disclosure This refers to the commitment of the company to disclose environment information within and outside the organisation through appropriate media.		Suggested to be added.	Agreed
2.3. Compliance requirement			
2.3.11. Penalties for non-compliance This refers to any penalties for non-compliance with national, state and local regulations or any applicable international declaration conventions and	These are the sanctions, fines, etc. imposed on either the individual, organisations or a state which	"Polluter pays" principle should be applied for non-compliance with environment management.	Agreed, but I think it is already covered in the definition.

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
treaties associated with environmental regulatory requirements.	failed to comply with the environmental laws, regulations and other requirements.	Specify time e.g. within the reporting period.	Agreed. But I think it is already covered in the definition.
		The action taken to rectify the non-compliance	Agreed, but I think it is already covered in the definition.
2.3.12. Environmental liabilities under applicable laws and regulations This refers to all liabilities required by laws and regulations, e.g. liabilities arising from contaminated land and water.	Agreed	Retain	Agreed
2.3.13. Litigation about environmental issues This refers to legal proceedings present for violating environmental laws.	Agreed	Retain	Agreed
2.4. External recognition and activities			
2.4.11. Environmental achievements and awards received This refers to any environmental achievements and awards received, e.g. awards for environmental protection, awards for energy conservation, awards for greenhouse gas emission control, etc.	Agreed	Retain, but I would leave out the "awards" part as this may be subjective and not necessarily reflect the actual performance on the ground. They also vary in nature and categories, e.g. one may have an award on, say, energy conservation, but on the ground they perform poorly on waste management. The awards tend to paint a good image on the	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
		surface, which is not what you want in this respect.	
2.5. Financial information			
2.5.11. Environmental expenditure This refers to any costs incurred in managing the environment, e.g. the cost of waste disposal or the cost associated with cleaner production measures, the purchase of pollution control equipment and facilities, the operating cost for pollution control equipment and facilities, the cost incurred for training employees and the community about the environment, etc.	Agreed	Retain	Agreed
2.5.12. Environmental fees This refers to fees related to environmental licence fees, taxes or charges as condition for operations.	Agreed	Retain	Agreed
Environmental incidents **-**This refers to costs incurred related to environmental incidents		Suggested for addition	Not agreed. Environmental incidents are incidents which occurred as the result of a negative event in the environment.
2.5.13. Donation or grants This refers to any contribution made by organisations, e.g. donation to non-profit environmental activities, such as funding for academic research or community activities such as tree planting.	Agreed	Should be termed: "corporate social responsibility (CSR)".	Agreed
		Could include supporting students' environmental clubs.	

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
~~**2.5.14. Cost related to treatment and disposal of hazardous waste**~~ ~~This refers to annual costs for the treatment and disposal of hazardous wastes~~	Agreed. But the word "Annual" can be removed.	Delete. Included in 2.4.1.	Agreed
2.5.15. Environmental liabilities This refers to costs related to all liabilities related to environmental remediation, e.g. liabilities associated with the sites, processes and product.	Agreed	Retain	Agreed
3. Environmental performance			
3.2. Energy consumption		The title should read: "Energy source, unit demand and consumption".	Not agreed. I think the original heading is more inclusive and covers all the other issues.
3.2.11. Total energy consumed per year and per unit of output	None	Retain	None
3.2.12. Total energy used from renewable sources such as water, wind, biomass and solar.	None	Retain	None
3.2.13. Proportion of energy sourced from heavy fuel oil	None	Retain	None
3.2.14. Proportion of energy sourced from coal	None	Retain	None
3.2.15. Proportion of energy sourced from wood	None	Retain	None
3.2.16. Proportion of energy sourced from natural gas	None	Retain	None
3.2.17. Proportion of equipment (including office equipment and	Agreed	Retain	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
light) containing power and saving devices This refers to energy savings and the efficient use of energy in business operations.			
3.2.18. Disclosure of energy use by facility or segment level	None	Retain	None
3.2.19. Comparison of energy consumption with the previous year or reduction target level	None	Retain	None
3.2.20. Utilising waste materials for energy production This refers to any programmes that utilise waste for the production of energy.	Agreed	Retain	Agreed
3.2.21. Disclosing energy saving resulting from product recycling This refers to the amount of energy saved due to recycling of products.	Agreed	Retain	Agreed
3.2.22. Disclosing increased energy efficiency of products This refers to any strategies that have resulted in products with efficient energy consumption.	This refers to the action of reporting the level or amount of energy efficiency from particular products. In other words, it refers to the extent to which a particular product is capable of providing an increased amount of energy.	-Retain	Agreed
3.2.23. Research and development aimed at improving energy efficiency of products	Agreed	Retain	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
This refers to any research done in order to improve energy efficiency of products.			
3.1.14 System energy balance analysis Refers to an indication to what comes in, consumption and what dissipated in terms of		Suggested to be added	Agreed, but the definition is incomplete. It can be completed from the source.
3.3. Water consumption		It should read: "Water source, unit demand and consumption".	
Water abstraction, use and discharge permit		**Suggested to be added**	
3.3.11. Total water consumption per annum and per unit of output	None	Retain	None
3.3.12. Water consumed by various uses such as processing, cooling and sanitation	None	Retain	None
3.3.13. Total water withdrawal by source This refers to what sources of water (sources such as borehole, rain water, dam, etc.) are used by the organisation.	This refers to the amount of water produced or obtained from sources such as boreholes, rain water, dam, rivers, etc. that is used by the organisation in its daily operations.	Heading should read: "Total water abstraction by source".	Agreed
3.3.14. Water sources significantly affected by withdrawal of water This refers to what source of water is highly affected in terms of amount of water drawn, and the effects on other users of the source, etc.	Agreed	Retain	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
3.3.15. Total and percentage of water recycled and/or re-used	None	Retain	None
3.3.16. Total and percentage of water saved through efficiency measures	None	Retain	None
Water balance analysis This refers to the volume of water abstracted, stored onsite, consumed and lost through natural events such as seepage into the ground and evaporation.		Suggested to be added	Agreed
Waste water treatment technology in place		Suggested to be added	
3.4. Land use and biodiversity		It should read: "Land use, biodiversity and sensitive areas".	
3.4.11. Area of land disturbed This refers to any area/part of land which is disturbed by the organisational activities (here activities such as cultivation, storage yards, etc. are considered).	Agreed	It should read: "Area of land disturbed/cleared".	Not agreed. Retain the original formulation, because whatever happened on the land, it means land disturbance.
3.4.12. Area and percentage of land rehabilitated This refers to what part of the total land area disturbed is rehabilitated by the organisation.	Agreed. Delete the word "is"- true	Retain	Agreed
3.4.13. Area of land used as buffer zones This refers to what part of the area has been considered by the organisation as a buffer	Agreed. But it can be improved as follows: This refers to the part of the land	Retain	Agreed

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
zone against any environmental phenomena such as floods, gales, etc.	considered by the organisation as a buffer against all sorts of environmental risks and degradation.		
3.4.14. Area of land subjected to dry land salinity This refers to any area of land with soil salinity, heavy metals, etc. due to the organisational operations.	Agreed	Retain	Agreed
3.4.15. Area of land with significant erosion of topsoil This refers to any area of land with significant soil erosion due to the organisational operations.	Agreed	Retain, but the response by the organisation may be subjective.	Agreed
3.4.16. Level of habitat impacts and restoration as a result of organisational operations.	None	Retain, but the response by the organisation may be subjective.	None
Posting rehabilitation bonds(in the case of mining projects)		Newly suggested item	
Involvement of the community in rehabilitation activities		Newly suggested item	
3.5. Materials and other resources used			
3.5.11. Quantity of each type of renewable and non-renewable resource used per year and per unit of output This refers to weight or volume of materials that are used to produce the primary product of the organisation during the reporting period	None	Retain	Agreed
3.5.12. Quantity of toxic or hazardous substances consumed	None	retain	None

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
per year and per unit of output			
3.5.13. Percentage of inputs saved through efficiency measures	None	Retain	None
3.5.14. Sources of materials used and quantity per source This refers to material sources, both locally and imported.	Agreed, but it should read: "Materials locally produced and imported".	Retain	Agreed
3.6. Emission of effluent, waste and other emissions into the air			
3.6.11. Total quantity of greenhouse gas(GHG) emissions in terms of their CO_2 equivalent per year and by unit of output	None	This may need guidance as most organisations do not measure CO_2.	None
3.6.12. Disclosure of GHG emission by source (e.g. coal, fuel, gas, etc.)	None	This may need guidance.	None
3.6.13. Disclosure of GHG emission by facility or by segment level	None	This may need guidance as most organisations do not measure CO_2 emissions.	None
3.6.14. Number of days the facility exceeds the emissions per year(based on NEMC and other international standards which has been ratified by the Tanzanian government)	None	retain	None
3.6.15. Comparison of GHG emission with that of the previous year	None	This may need guidance.	
3.6.16. Description of the methodology used to calculate GHG emissions	None	This may need guidance.	None

¤ Disclosed Item	Your Remarks	Remarks from others	Remarks
3.6.17. Volume of wastewater discharges per annum and per unit of output	None	Retain	None
3.6.18. Quantity of solid waste generated per annum and per unit of output	None	Retain	None
3.6.19. Type and quantity of hazardous waste generated per year and per unit of output	None	Retain	None
3.6.20. Volume of hazardous waste stored on- and off-site	None	Retain	None
Internal waste handling procedures (collection, sorting and disposal)		**Suggested to be added**	Agreed
3.6.21. Any waste prevention activities in place and its expected benefit	None	Retain	None
3.6.22.		Deleted, a duplicate of 3.1.10	

APPENDIX I

Disclosure index: Round three

Thank you for the continuing support in participating in this study. From the previous rounds of the enquiry, the experts' suggestions were considered and a comprehensive list, which includes three categories of items (with some sub-categories) to be disclosed by the industrial sector when reporting on environmental issues, was prepared. In this round, therefore you are requested to rate the items and sub-items to be disclosed depending on their importance, based on the Likert scale below.

1-Item is unimportant

2-Item is of minor importance

3-Item is of intermediate importance

4-Item is important

5-Item is very important

Please place an **"X"** against the selected level of importance.

	unimportant	**Minor importance**	**intermediate importance**	**Important**	**Very important**
	1	**2**	**3**	**4**	**5**
1. Broad overview /organizational context					
Organisational profile					
Top management commitment on environment					
A descriptive overview of the major environmental risks and impacts of the organisation activities					
Establishment of environmental targets and objectives					
Discussion of environmental regulations and requirements					
Environmental management policies and systems					
Budget for environment management					

	unimportant	Minor importance	intermediate importance	Important	Very important
	1	2	3	4	5
Environmental Management structure					
2 Environment management performance					
2.1 Management systems and programs					
Environment management system available					
Performance against set standards and requirement					
Adherence to internal policies					
Environmental monitoring and audit-programs					
Environmental risk management strategies					
Implementation of cleaner production techniques or technologies					
Waste water treatment technologies in place					
Institutional arrangement for environmental management					
Environmental training and awareness programs					
Environmental grievance handling procedures					
Supporting environmental protection campaigns activities					
Designing facilities harmonious with the environment					
Prevention/rehabilitation or restoration of damage to the environment					
Conservation of natural resources					
2.2 Compliance requirement					
Penalties for non-compliance					
Environmental liabilities under applicable laws and regulations					
Litigation about environmental issues					
2.3 External recognition and activities					
Environmental achievements and awards received					
2.4 Financial information					
Environmental expenditure					

	unimportant	Minor importance	intermediate importance	Important	Very important
	1	2	3	4	5
cost related environmental fees					
cost related to environmental incidences					
Corporate social responsibility					
Environmental liabilities					
3 Environmental performance					
3.1 Energy consumption					
Total energy consumed per year and per unit of output					
Total energy used from renewable sources such as water, wind, biomass and solar					
Proportion of energy from heavy fuel oil					
Proportion of energy from diesel gas oil					
Proportion of energy from premium motor spirit					
Proportion of energy from illuminating kerosene or jet A-1 fuel					
Proportion of energy from coal					
Proportion of energy from wood					
Proportion of energy from natural gas					
Proportion of equipment (including office equipment and light) containing power and saving devices					
Disclosure of energy use by facility or segment level					
Comparison of energy consumption previous year or reduction target level					
Utilizing waste materials for energy production					
Disclosing energy saving resulting from product recycling					
Disclosing increased energy efficiency of products					
Research and development aimed at improving energy efficiency of product					
System energy balance analysis					

	unimportant	Minor importance	intermediate importance	Important	Very important
	1	2	3	4	5
3.2 Water consumption					
Water abstraction use and discharge permit					
Total water consumption per annum and per unit of output					
Water consumed by various uses such as processing, cooling and sanitation					
Total water withdrawal by source					
Water sources significantly affected by withdrawal of water					
Total and percentage of water recycled and/ or re-used					
Total and percentage of water saved through efficiency measures					
Water balance analysis					
3.3 Land use and Biodiversity					
Area of land disturbed					
Area and percentage of land rehabilitated					
Area of land used as buffer zones					
Area of land subjected to dry land salinity					
Area of land with significant erosion of topsoil					
Level of habitat impacts and restoration as a result of organisation's operation					
Posting rehabilitation bonds (in case of mining project					
3.4 Materials and other resources used					
Quantity of each type of renewable and non-renewable resource used per year and per unit output					
Quantity of toxic or hazardous substances consumed per year and per unit output					
Percentage of inputs saved through efficiency measures					
Sources of materials used and quantity per source					

	unimportant	Minor importance	intermediate importance	Important	Very important
	1	2	3	4	5
3.5 Emission to air, effluent, waste and other emissions					
Total quantity of greenhouse gas (GHG) emissions in terms of their co2 equivalent per year and by unit output					
Disclosure of GHG emission by source (.e.g. Coal, fuel, gas etc.)					
Disclosure of GHG emission by facility or by segment level					
Number of days the facility exceeds the emissions per year					
Comparison of GHG emission with the previous year					
Description of the methodology used to calculate GHG emissions					
Volume of wastewater discharges per annum and per unit output					
Quantity of solid waste generated per annum and per unit output					
Type and quantity of hazardous waste generated per year and per unit output					
Volume of hazardous waste stored on-and off-site					
Internal solid Waste handling procedures (collection, sorting and disposal					
Any waste prevention activities in place and its expected benefit					

APPENDIX J

Table showing detailed rating of the reporting items

xi =Values of the Likert scale (weight)

ni= Total number of experts who responded to the item

S/N	Disclosure items	1	2	3	4	5			
		Xi= 1-5							
1	**Organisational context**						**ni**	**∑ nix i**	**Mean= ∑ni xi/ni**
1.1	Organisational profile.	0	0	6	8	8	22	90	4
1.2	Top management commitment.	0	0	0	17	5	22	93	4
1.3	Descriptive overview of the significant environmental risks and potential impact of the activities of the organisation	0	0	6	10	6	22	88	4
1.4	Establishment of environmental targets and objectives.	0	0	3	13	6	22	91	4
1.5	Environmental compliance obligations.	0	3	0	13	6	22	88	4
1.6	Environmental management policies and systems.	0	3	0	11	8	22	90	4
1.7	Budget for environmental management.	0	3	3	8	8	22	87	4
1.8	Environmental management board and committees.	0	0	8	14	0	22	80	3
2.**Management performance, policies and systems**									
2.1 **Management systems and programmes**									
2.1.1	Environment management system available.	0	0	3	11	8	22	93	4
2.1.2	Performance against set standards and requirements.	0	3	6	7	3	19	67	4
2.1.3	Adherence to internal policies.	0	0	0	14	3	17	71	4
2.1.4	Environmental monitoring and audits programmes.	0	0	3	11	8	22	93	4
2.1.5	Environmental risk management strategies.	0	0	0	17	3	20	83	4

S/N	Disclosure items	1	2	3	4	5			
		Xi= 1-5							
2.1.6	Implementation of cleaner production techniques or technologies.	0	0	8	11	3	22	83	4
2.1.7	Waste water treatment technologies in place.	0	0	3	11	8	22	93	4
2.1.8	Institutional arrangement for environmental management.	0	0	7	9	4	20	77	4
2.1.9	Environmental training and awareness programmes.	0	0	8	6	8	22	88	4
2.1.10	Environmental grievance handling procedures.	0	0	11	5	6	22	83	4
2.1.11	Supporting environmental protection campaigns/activities.	0	3	6	13	0	22	76	4
2.1.12	Designing facilities harmonious with the environment.	0	6	3	11	2	22	75	4
2.1.13	Prevention/rehabilitation or restoration of damage to the environment.	0	3	5	8	6	22	83	4
2.1.14	Conservation of natural resources.	0	5	5	9	3	22	76	4
2.2 Compliance requirement									
2.2.1	Penalties for non-compliance.	0	0	3	16	3	22	88	4
2.2.2	Environmental liabilities under applicable laws and regulations.	0	0	5	11	6	22	89	4
2.2.3	Litigation about environmental issues.	0	3	6	6	7	22	83	4
2.3. External recognition and activities									
2.3.1	Environmental achievements and awards received.	0	16	6	0	0	22	50	2
2.4. Financial information									
2.4.1	Environmental expenditure.	0	0	8	14	0	22	80	4
2.4.2	Costs related to environmental fees.	0	6	5	8	3	22	74	3
2.4.3	Costs related to environmental incidents.	0	3	8	7	4	22	78	4
2.4.4	Corporate social responsibility.	0	6	8	6	0	20	60	3

S/N	Disclosure items	1	2	3	4	5			
		Xi= 1-5							
2.4.5	Environmental liabilities.	0	0	11	11	0	22	77	4
3	**Environmental performance**								
3.1	**Energy consumption**								
3.1.1	Total energy consumed per year and per unit of output.	0	0	11	8	3	22	80	4
3.1.2	Total energy used from renewable sources such as water, wind, biomass and solar.	0	3	8	5	6	22	80	4
3.1.3	Proportion of energy from heavy fuel oil.	0	0	11	8	3	22	80	4
3.1.4	Proportion of energy from diesel gas oil.	0	7	7	4	4	22	71	3
3.1.5	Proportion of energy from premium motor spirit.	0	5	11	5	1	22	68	3
3.1.6	Proportion of energy from illuminating kerosene or jet A-1 fuel.	0	14	4	3	1	22	57	3
3.1.7	Proportion of energy from coal.	0	0	8	8	3	19	71	4
3.1.8	Proportion of energy from wood.	0	3	8	8	2	21	72	4
3.1.9	Proportion of energy from natural gas.	0	0	11	8	3	22	80	4
3.1.10	Proportion of equipment (including office equipment and light) containing power and saving devices.	0	3	8	11	0	22	74	3
3.1.11	Disclosure of energy use by facility or segment level.	0	0	14	8	0	22	74	3
3.1.12	Comparison of energy consumption with the previous year or reduction target level.	0	0	3	11	3	17	68	4
3.1.13	Utilising waste materials for energy production.	0	3	0	17	2	22	84	4
3.1.14	Disclosing energy saving resulting from product recycling.	0	0	8	14	0	22	80	4
3.1.15	Disclosing increased energy efficiency of products.	0	3	5	14	0	22	77	4
3.1.16	Research aimed at improving energy efficiency of products.	0	0	8	11	3	22	83	4

S/N	Disclosure items	1	2	3	4	5			
		Xi= 1-5							
3.1.17	System energy balance analysis.	0	3	3	11	0	17	59	4
3.2 Water consumption									
3.2.1	Water abstraction use and discharge permits.	0	0	6	11	5	22	87	4
3.2.2	Total water consumption per annum and per unit of output.	0	0	3	19	0	22	85	4
3.2.3	Water consumed by various uses such as processing, cooling and sanitation.	0	0	6	16	0	22	82	4
3.2.4	Total water abstraction by source.	0	3	0	17	2	22	84	4
3.2.5	Water sources significantly affected by withdrawal of water.	0	3	4	10	5	22	83	4
3.2.6	Total and percentage of water recycled and/or re-used.	0	0	3	15	4	22	89	4
3.2.7	Total and percentage of water saved through efficiency measures.	0	3	3	12	4	22	83	4
3.2.8	Total percentage of water lost through the process.	0	3	12	6	1	22	71	3
3.3Land use and biodiversity									
3.3.1	Area of land disturbed.	0	3	6	10	3	22	79	4
3.3.2	Area and percentage of land rehabilitated.	0	3	6	7	6	22	82	4
3.3.3	Area of land used as buffer zones.	0	0	14	8	0	22	74	3
3.3.4	Area of land subjected to dry land salinity.	0	3	8	11	0	22	74	3
3.3.5	Area of land with significant erosion of topsoil.	0	6	5	11	0	22	71	3
3.3.6	Level of habitat impacts and restoration as a result of the operations of the organisation.	0	6	3	7	6	22	79	4
3.3.7	Posting rehabilitation bonds (in the case of mining projects).	0	3	3	11	5	22	84	4
3.4 Materials and other resources used									

S/N	Disclosure items	1	2	3	4	5			
		Xi= 1-5							
3.4.1	Quantity of each type of renewable and non-renewable resource used per year and per unit of output.	0	6	7	8	1	22	70	3
3.4.2	Quantity of toxic or hazardous substances consumed per year and per unit of output.	0	3	6	10	3	22	79	4
3.4.3	Percentage of inputs saved through efficiency measures.	0	3	6	13	0	22	76	4
3.4.4	Sources of materials used and quantity per source.	0	9	6	7	0	22	64	3
3.5 Emission of effluent, waste and other emissions into the air									
3.5.1	Total quantity of greenhouse gas (GHG) emissions in terms of their CO_2 equivalent per year and by unit of output.	0	0	8	8	6	22	86	4
3.5.2	Disclosure of GHG emission by source (.e.g. coal, fuel, gas etc.).	0	3	11	6	2	22	73	3
3.5.3	Disclosure of GHG emission by facility or by segment level.	0	6	6	6	4	22	74	3
3.5.4	Number of days the facility exceeds the emissions per year.	0	3	3	5	11	22	90	4
3.5.5	Comparison of GHG emission with the previous year.	0	3	6	13	0	22	76	4
3.5.6	Description of the methodology used to calculate GHG emissions.	0	3	6	11	2	22	78	4
3.5.7	Volume of waste water discharges per annum and per unit of output.	0	0	3	17	2	22	87	4
3.5.8	Quantity of solid waste generated per annum and per unit of output.	0	0	6	16	0	22	82	4
3.5.9	Type and quantity of hazardous waste generated per year and per unit of output.	0	0	3	14	5	22	90	4
3.5.10	Volume of hazardous waste stored on- and off-site.	0	3	6	8	5	22	81	4
3.5.11	Internal waste handling procedures (collection, sorting and disposal).	0	3	6	13	0	22	76	4

S/N	Disclosure items	1	2	3	4	5			
	Xi= 1-5								
3.5.12	Any waste prevention activities in place and its expected benefit.	0	0	5	17	0	22	83	4

APPENDIX K

ANGLOGOLD ASHANTI
GEITA GOLD MINE

Environmental Policy.

We respect the Environment. Geita Gold Mine is conscious that mining and associated activities affect the environment to greater or lesser degree. GGM is committed to continual improvement in environmental performance, believing that it is good business practice and contributes to stakeholders' confidence.

To achieve this we will:-

- Achieve a level of environmental performance that meets both AGA and Tanzanian industry standards.
- Place environmental management as a key accountability of GGM employees from management to employees.
- Comply with all relevant national and international legislation, regulations, and other requirements as a minimum standard for our environmental practices and management procedures.
- Require all its contractors to comply with GGM environment policies and standards while undertaking work for GGM.
- Maintain an Environmental Management System based on ISO14001 standard, and assess the effectiveness of the system through periodic audits and management reviews.
- Define environmental objectives on an annual basis and measure performance against those objectives.
- Maintain environmental management programmes, standards and procedures to achieve GGM's environmental objectives, based on the principles of continual improvement, pollution prevention, and minimal environmental impacts.
- Prevent environmental incidents by adopting proactive hazard identification and a risk focused approach, as well as investigating all incidents to ensure remedial actions are identified and completed to prevent reoccurrence.
- Integrate environmental considerations into all designs and activities.
- Provide all necessary resources to enable compliance with the environmental management system.
- Require all contractors to comply with GGM's environmental policy and standards while undertaking work for GGM.
- Ensure that employees at all levels receive appropriate training and are competent to carry out their duties and accountabilities in an environmentally responsible manner.
- Maintain communication with stakeholders to review and discuss environmental issues, improve performance, and find solutions to environmental concerns.
- Review this policy at least annually to ensure continued applicability to GGM's business
- Make this policy available to the general public upon request.

Managing Director
Geita Gold Mine Ltd.

Terry Mulpeter,
Managing Director

Document:	GHSE-POL-03503 Geita Gold Mine Environmental Policy				
Prepared By	HSE & Training Manager	Reviewed By	HSE & Training Manager	Approved By	Managing Director
Issue Date:	21 September 2016	Print Date:	21 September 2016	Next Review Date:	21 September 2017
Version No:	2.0			Page No:	Page 1 of 1

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APPENDIX L

BUREAU VERITAS
Certification

AngloGold Ashanti – Geita Gold Mine
Geita, Geita Region, United Republic of Tanzania

Bureau Veritas Certification Holding SAS – UK Branch certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 14001:2004

Scope of certification

Mining and production of gold

Certification cycle start date: 18 September 2015

Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on: **17 September 2018**

Original certification date: 07 June 2013

Certificate No. IND15.6507 U/E Version 1, Revision date: 18/09/2015

Signed on behalf of BVCH SAS UK Branch

Certification body address: 66 Prescott Street, London, E1 8HG
Local office: First Floor Summit Office Park, 495 Summit Road, Morningside.

UKAS MANAGEMENT SYSTEMS
008

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please call: **+2711 217 6300**

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APPENDIX M