INVESTIGATIONS ON IMPLEMENTATION AND COMPLIANCE OF ENVIRONMENTAL MANAGEMENT SYSTEMS BY COMPANIES IN KENYA

VICTOR MUASYA MUTUKU

MASTER OF SCIENCE

(Environmental Legislation and Management)

JOMO KENYATTA UNIVERSITY OF

AGRICULTURE AND TECHNOLOGY

2021

Investigations on Implementation and Compliance Of Environmental Management Systems by Companies in Kenya

Victor Muasya Mutuku

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Environmental Legislation and Management of the Jomo Kenyatta University of Agriculture and Technology

2021

DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature ……Date …….

Victor M. Mutuku

This thesis has been submitted for examination with our approval as University supervisors.

Signature ……Date …….

Prof. George M. Ndegwa

JKUAT, Kenya

Signature ……Date …….

Prof. Jackson J. Kitetu,

JKUAT, Kenya

ACKNOWLEDGEMENTS

Most of all I am very grateful to God for giving me life and sustaining me in good health.

With sincere gratitude I wish to acknowledge my supervisors Prof. G. M. Ndegwa and Prof. J. J. Kitetu for the critical comments, guidance, suggestions and encouragement they gave throughout the period of coming up with this thesis.

I wish to also acknowledge the unwavering support and encouragement of my family and friends.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

BOD	Biological Oxygen Demand
BSI	British Standards Institute
CAC	Command and Control
CEO	Chief Executive Officer
CLD	Causal Loop Diagram
COD	Chemical Oxygen Demand
EIA	Environmental Impact Assessment
EM	Environmental Management
EMS	Environmental Management System
EMP	Environmental Management Plan
EMAS	Eco-Management and Audit Scheme
ENGO	Environmental Non-Governmental Organization
EP	Environmental Permit
US-EPA	United States Environmental Protection Agency
EU	European Union
GDP	Gross Domestic Product
HRM	Human Resource Manager
IMF	International Monetary Fund

ISO	International Organization for Standardization
LCA	Life Cycle Analysis
LDCs	Less Developed Countries
MNCs	Multi-National Corporations
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organization
ODS	Ozone Depleting Substances
PER	Preliminary Environmental Permit
PM	Production Manager
PPT	Pollution Prevention Technology
QMS	Quality Management System
SGS	Société Générale de Surveillance

ABSTRACT

There is a general lack of standardized Environmental Management System (EMS).International Organization for Standardization (ISO) 14001 is a specification standard and benefits associated with its compliance are many.The main aim of this study was to investigate factors that influence implementation and compliance of ISO 14001 based Environmental Management Systems by industries in Kenya.The specific objectives were: to evaluate current status of EMS adoption by Kenyan industries; determine key factors that influence adoption of Environmental Management practices and extent of compliance to local environmental regulations by industries in Kenya. The study adopted the quantitative research method. It was based in all the major industrial towns of Kenya that included Nairobi, Mombasa, Kisumu, Nakuru, Naivasha, Kericho, Eldoret, Kitale,Thika and Machakos. Stratified random sampling was employed whereby three strata were chosen namely; agricultural, manufacturing and service industries. The target population was 30 respondents companies. The current status of EMS adoption indicated that 31% of the companies had waste management systems in place, while 20% of them had been certified to ISO 14001 EMS. The study also noted that pollution prevention was the major driver (27.5%) for the implementation of EM, followed by cost reduction, (23.2.%),facilitation of compliance to local environmental regulations,(18.8%), international acceptance,(14.5%), while pressure from customers took 8.7%.The study concluded that pollution prevention was the major driver for development of EM practice by Kenyan industries. The study recommended that to enhance good environmental quality, enforcement of applicable legislation should be combined with education on voluntary EMS, which is a new area of strategies for EM in Less Developed Countries(LDCs).More research is therefore needed in sectors that have significant impacts on the environment and rural livelihoods like the mining sector. Furthermore, it is essential to examine how auditors perceive EMS within small and medium enterprises (SMEs) in LDCs.

CHAPTER ONE

INTRODUCTION

1.1 Background

Environmental Management System (EMS) is a concept based on continuous improvement in all aspects of a firm's environmental performance. According to Khanna and Anton (2002), EMS represents an organizational change within firms and a self-motivated effort at internalizing environmental externalities. This is achieved by adopting management practices that integrate environment and production decisions, which identify opportunities for pollution reduction. These enable the firm to make continuous improvements in production methods and environmental performance (Mbohwa &Fukada, 2002).

Standards for environmental management systems have been developing over the years (Brorson and Larsson, 1999). The British Standards Institution (BSI) introduced the first standard for environmental management in 1992 (BS 7750). The International Organization for Standardization (ISO) introduced the ISO 14000 series in September 1996 that specifies the requirements for an EMS (Clements, 1996; Brorson and Larsson, 1999).Clement (1996) notes that the standard applies to those environmental aspects over which the firm either has control or could be expected to have an influence on. Aboulnaga (1998) pointed out that the adoption and use of an EMS can be a source of competitive advantage to industries and organizations wishing to compete on the international market.

Roy and Vezina (2001) have shown that environmental initiatives can be used to enhance a firm's innovative capability. Sheldon (1997) indicated that ISO 14001 has been heartily welcomed by people in government, business and academia. It is believed globally that the standard is useful and one that argues well for the future of environmental management (Moxen and Strachan, 2000). Other proponents of ISO

14001 like Stapleton et al (2001) argued that the standard could act as a framework for significantly improving organizational performance.

The distribution of firms that implement ISO 14001 as an EMS standard varies significantly across the globe. As appendix 1 indicates, out of the 7,887 ISO 14001 certified facilities worldwide in December 1998, about fifty percent (50%) were located in the European Union while twenty percent (20%) were located in Japan. Firms from developing countries and the transitional economies of Central and Eastern Europe accounted for a small proportion of the total (EPA ,1999)

As of January 2006, about 103,583 companies had been certified to ISO 14001 (ISO World, 2006). Most of these companies are in developed countries, with Japanese companies leading with about 19,477 certificates. This country is followed by China, Spain, Italy, the U.K and the U.S. A. (Kolk, 2000):

Companies in Africa that compete with those in developed countries stand a chance to gain market shares by adopting the voluntary environmental management standards (Noci and Verganti, 1999). Such markets are characterized by high level of environmental concern and restrictive environmental legislation. By adopting and being certified, a company can improve its market share and reduce expenses related to environmental taxes, energy, waste, water usage, emissions and fines (Madsen & Ulhoi, 1999):

1.2 Problem statement

According to Kenya Bureau of Statistics about 80% of industries in Kenya are located in major towns. These industries have had a large impact on the economy of the towns and the country in general. The concentration of industries in small areas has aggravated the environmental stress caused by industrial activities. Some of the major problems include industrial liquid and solid waste, air and water pollution.

For instance, the quantity and quality of industrial wastes have increased over the years; however, there is almost no waste recycling, treatment or proper management practices in the country. (NEMA, 2007).Furthermore, vehicular exhaust emissions have been a significant cause of poor urban air quality over the years in Kenya (NEMA, 2007)**.**This, together with heavy traffic in certain urban locations, contributes to poor urban air quality. According to NEMA (2007), surface water resources that pass through urban areas, like Nairobi and Kisumu are heavily polluted. Pollution of water bodies has led to destruction of aquatic life.

Waste management is a major problem and a solution is yet to be found through establishment of a comprehensive recycling system in the country. Effluent treatment facilities within industries are unavailable and, if available, they are outmoded and poorly maintained. There is general lack of standardized EMS.ISO 14001 is a specification standard and the benefits associated with its compliance are many. However, most companies in Kenya operate without due regard to the environment in which they carry out their activities. This is against the principle of sustainable development which addresses the needs of today without diminishing the capacity of future generations to meet their own needs (WCED, 1987).The study therefore aimed to investigate factors that influence implementation and compliance of ISO 14001 based Environmental Management Systems by industries in Kenya.

1.3 Overall Study objective

The main aim of this study was to investigate factors that influence implementation and compliance of ISO 14001 based Environmental Management Systems by industries in Kenya.

1.3.1 Specific objectives:

i. To evaluate current status of EMS adoption by Kenyan industries.
ii. To determine key factors that influence adoption of EM practices in Kenya.
iii. To evaluate extent of compliance to local environmental regulations by industries in Kenya

1.4 Hypotheses

1) Most companies in Kenya have complied with ISO 14001 EMS standards.
2) There are no real "drivers" for the adoption of ISO 14001 EMS in Kenya.
3) Most industries in Kenya comply to local environmental regulations

1.5 Justification

EMS has the ability to imbibe voluntary management of the environment as done by our ancestors in that, industries would take as part of their obligation the management of the environment. They would manage waste generated and find means of disposing it through cheaper methods other than what is currently being done. Recycling can be done and this would lead to cost reduction in the acquisition of new resources. Energy use would be monitored and controlled, staff would be made aware of the importance of environmental management and they would be educated to be committed to the environmental policy of the organization.Emissions and discharges would be controlled through the use of emission control and waste treatment facilities.

This study investigated the reasons behind the low level of certification to ISO 14001 by industries in Kenya.The study is aimed at helping to shape decisions by policy makers on the efficacy of local and international voluntary standards and its policy implications to economic development and sustainable development in Kenya.This study provide industries with reference information on international standards and benefits they would derive from it. The study would therefore serve as a reference point to industries and

policy makers trying to make sustainable development a priority in their activities.

This study is aimed at 'diagnosing' the problem and making recommendations for future increase in certification. Results from the study would lead to increase in certification, and improve the environment by way of reduction of emissions and waste production for sustainable development.

1.6 Scope & Limitations to the Study

Data for the study were collected from 30 companies in different sectors of industries in major Kenyan towns, therefore making it difficult to make a clear-cut generalization to all industries in Kenya. Despite this limitation, over 60% of all industries in the country are located in these major towns. The selection of companies was stratified. Some of the companies declined to participate in the study and some, due to bureaucracy, could not allow for the administration of the questionnaire directly to individuals responsible to the environment. The questionnaire was therefore left with the Production Manager or Human Resource Manager to be delivered to the person responsible to the environment. These lead to bias in responses which ultimately affected the study. The study data were also limited by knowledge and personal judgment of participants as they were obtained through personal interviews and written responses. They thus had to rely on memory on why and how some events occurred at their establishments. The anonymity of the companies was assured but some would as much as possible try to protect the image and reputation of their companies making it difficult to say whether the responses were what was actually happening in the establishments.

CHAPTER TWO

LITERATURE REVIEW

2.1 Business and the Environment

2.1.1 Identification of Business

Business has experienced dramatic change since the beginning of the Industrial Revolution which took place in Western Europe two hundred years ago (Blair, 2001). New businesses appeared such as chemical industry, motor industry, and retail industry; new technology was applied everywhere; and new markets were opened all over the world. All these changes of business area caused environmental impacts which were totally different two hundred years ago. Business is the range of commercial organizations and their activities that characterize the way in which trading is conducted in a capitalist economy (Blair, 2001). However, commonly the words “industry” and “business” are used interchangeably and this is the case in this study. Business with the same meaning of industry which is seen as the collection of firms who operate essentially the same series of processes that result in a related set of products (whether tangible products or services) that a third party wishes to buy (Blair, 2001). By convention, industries are divided into primary, secondary and tertiary industries. Primary industries include fishing, forestry, agriculture and the extractive industries (essentially, quarrying and mining). They involve the collection, harvesting and exploitation of resources directly produced by physical processes. Secondary industries are the manufacturing industries. They take raw materials and by a variety of processes produce tangible goods by adding value to the raw materials. Tertiary industries produce services, for either individuals or for other organizations, these include business processing outsources, hotels, hospitals, certification and auditing companies etc.

The ways in which primary, secondary and tertiary industries affect the environment are seen as being sufficiently different to warrant separate analysis.

2.1.2 Environmental Impacts of Different Businesses

The environmental impacts of different industrial sectors vary enormously (Welford, 1998). For example, the oil industry may cause serious environmental impacts while the retail industry has less direct impacts to the environment. This is because the oil industry belongs to primary industries while retail industry belongs to tertiary industries and the characteristics of these two industrial categories are totally different. Because of their intimate relationship with the environment, the primary industries have widespread and significant environmental impacts. Firstly, they cause high pollution. For example, oil and gas flares, which happened in oil industry, contribute to global warming. Additionally, oil spills can cause great localized harm to marine ecosystems. Secondly, the primary industries generate considerable wastes. Fossil fuel and mining industries are the main culprits in waste generation. However, wastes of factory farming also should not be neglected. Thirdly, farming and forestry of primary industries have the greatest overall impact on habitats because they occupy the greatest areas of land. The type of farming or forest has a profound influence on nature of flora and fauna of a region. Finally, farming and forestry also have significant landscape impacts because they form important landscapes in much of the developed world.

Manufacturing is the core of secondary industries. Raw materials and components are brought together and manufactured into either end product or a component for some other manufacturing process. Manufacturing processes consume huge amount of energy and inevitably produce waste products and pollution. Waste is seen as part of the process, whereas pollution is seen as an inevitable consequence of the process that should not happen in the perfect industrial process but which, in practice, results in the degradation of some physical resource. This is most usually the air, watercourses or the ground. Sound and visual impact may also be included under the broad banner of pollution. In addition to the manufacturing process, the products also cause environmental impacts during their delivery, use and disposal. Tertiary industries or service businesses receive relatively little attention on their environmental impacts. This

may be because in comparison to primary or secondary industries they appear to depend far less on physical resources and they often deal with a more intangible product. However, the environmental impacts of tertiary industries are less obvious but do not mean that they do not exist. For example, compared to an oil refinery, a supermarket seems to cause less environmental impact but this is not true. Transfer of goods within the supermarket chain, and customers traveling to the store especially suburban stores all cause air pollution. Other environmental impacts which tertiary industries cause include energy consumption in heating, lighting and equipment, pollution from traveling of their employees and clients, produce waste from canteens, consumer wastes and materials large volumes of paper waste.

2.1.3 Strategy towards environmental impacts

Since the 1960s, there has been a growing interest in the environment, or more specifically in the damage being done to the environment (Welford, 1998). During the first two decades, it was felt that growth and development and protection of the environment could not go hand in hand. Hence most of the theories that developed during this period were anti-growth. However, the 1980s witnessed a shift in thinking. The concept of ‘zero growth’ was replaced by sustainable development which has been broadly accepted nowadays.

Sustainable development, in its simplest form, is defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (WECD, 1987). It implies that it is possible to make development and environmental protection compatible. However, the old ways of development which cause pollution and atmospheric damage, disrupt traditional ways of living, destroy ecosystems and feed more and more power into international oligopolistic industrial structures must be changed into sustainable ways (Welford, 1998). The Brundtland Report, commissioned by the United Nations to examine long-term environmental strategies, argued that this would require quite radical changes in

economic practices throughout the world. As an ultimate objective, the concept of sustainable development is immensely valuable. However, strategies are needed to translate conceptual theories of what sustainable development means into practical ways of achieving it over time within the corporate context. Firms clearly have a role to play in the development of substitutes for non-renewable resources and innovations which reduce waste and use energy more efficiently. They also have a role in processing those materials in a way which brings about environmental improvements. Additionally, firms have the opportunity for considering both the use and disposal of the product during the design period. In order to achieve these goals, companies must seek to develop management strategies which will improve their environmental performance (Welford, 1998).

2.2 Environmental Management System

A very important element in understanding environmental management is to understand what the environment is (Hewitt and Gary, 1998). It is the surroundings in which an organization operates, including air, water, land, natural resources, flora fauna, humans and their interrelation(ISO, 1996). Hewitt and Gary (1998) defined Environmental Management (EM) as management of an organization's or company's activities impact on the environment. Therefore, in this study, EM is the process of reducing the environmental impact of an organization or people's activities through the control of all aspects of their operation that can cause or lead to an impact on the environment. The ISO 14001 standard defines EMS as that part of the overall management system which includes the organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing implementing, achieving, reviewing and maintaining the environmental policy (ISO, 1996). EMS is derived from the environmental policy of an organization. A policy is a set of rules or principles that an individual or organization adopts for a chosen course of action (Hewitt and Gary, 1998). It serves as the guiding document for environmental improvement.

2.3 Components of an EMS

EMS, according to ISO 14001 has four components. It is a cycle of, plan, do, check, and act. If the cycle is adhered to constantly, it leads to continuous improvement of the system. Figure 1 shows the EMS cycle which is an abstract description of the different components.

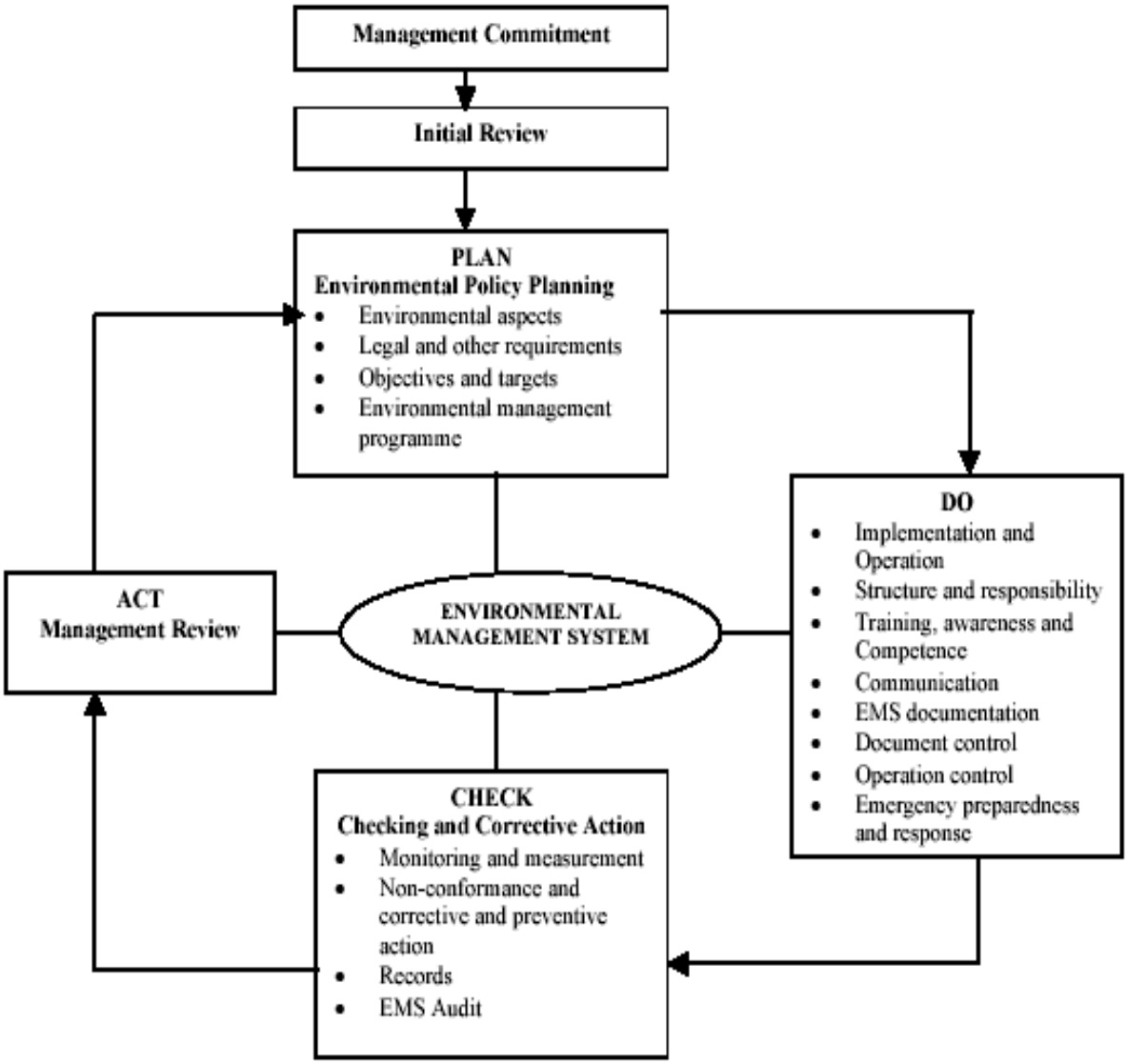

Figure 2.1: EMS Cycle According to ISO 14001

Source: Kuhre (1995)

The design and implementation of an EMS requires considerable time and effort therefore requiring the commitment of management of an organization. Management needs to communicate their support to the system and emphasize that they aim to improve their environmental performance. An inventory is then needed to access how the organization currently deals with environmental issues. This is the initial review and

it focuses on all elements of which an EMS consists of, in order to see the activities that have been undertaken and their results. Some of the topics to be treated here according to ISO 14001 include environmental impacts, use of resources like raw materials, water and energy, relevant regulations, organizational structures and culture, products and marketing, training and communications, instructions and handling of incidents. Deficiencies emerge as the system is used and gaps that need to be filled become clear.

The 'Plan' Phase

This stage is helpful in the formulation of an environmental policy. It serves the direction for future action and communication of the organization's environmental commitment and targets. According to ISO (1996) environmental policy deals with: the nature, scale, and environmental impacts of the organization's activities, products or services, a commitment to continual improvement and pollution prevention, a commitment to comply with relevant environmental legislation and regulations, and other requirements to which the organization subscribes, provides framework for setting and reviewing environmental objectives and targets, it is documented, implemented and maintained, it is communicated to all employees and it is available to the general public.

Environmental policy and planning starts with the assessment of environmental aspects and impacts of an organization's activities, products and services (Kuhre, 1995). Aspects are potential effects, which can be good or bad. They become impacts when they manifest themselves and lead to changes on landscape. Aspects can be direct or indirect resulting respectively from the firm's activities or from those of supplies. The organization's environmental programme specifies how the objectives and targets will be met by stipulating the actions, methods responsibilities, time frames and resources. These should be fully integrated in and coordinated with other areas of management and new structures identified to enable total environmental management.

The 'Do' Phase

An organizational chart is defined and laid down at this stage in order to embed the environmental management in the organization. Individual roles and responsibilities are outlined in addition to the allocation of resources like finance, personnel, skills and technology. The next step is the identification of training needs to build environmental awareness and competence. This is done from current staff or new employees recruited. Communication, both internally and externally is relevant for an EMS implementation since it helps keep people informed. Communication is best if it is top-down and bottom-up. It directs attention to the fact that environmental management involves more than a system with procedures, instructions, performance indicators, requirements and checks, laid down in manuals, plans, schemes and reports (ISO, 1996). Documentation is very important in any EMS since it points to implementation and operation. Document control entails designation of someone to be responsible for revision and change. Operations and activities must be controlled to ensure that policy addressing the most significant environmental aspects is carried out (ISO 1996).

The 'Check' Phase

This stage aims at checking how the firm performs in terms of environmental management and if necessary, to analyze the causes of problems, identify possibilities for improvement and take subsequent action to realize these changes (ISO, 1996). Operations and activities of significant environmental impacts are to be monitored, their performance measured and compared with the objectives and targets, and compliance with regulations assessed.

The 'Act' Phase

Management review here aims at making sure that the EMS continues to produce the desired effects as outlined in the policy. Apart from the information derived from audits, other internal reports on performance and incidents, external reports on regulatory and environmental changes, and suggestions for improvement received from internal and

external sources play a role for the organization to act upon. The process is then repeated again. The drivers or motivations to use EMS are internal and external involving different forces.

2.4 Drivers of EMS

Globalization coupled with industrialization with increasing environmental degradation has compelled a number of firms and organizations to adopt new strategies for sustainability. Business has also come to realize the enormity of their actions on the environment thus tries to adopt new techniques to champion sustainable development agenda. A number of pressures are now being put on organizations from all corners of the globe. Drivers of EMS in industries and organizations are grouped into two but with five different factors. They include; the organizations themselves, market, social including the public and community, financial organizations and regulatory authorities (ISO 1996).

2.4.1 Organizations

Environmental issues have become increasingly important in organization's activities since it acts as insurance for its stakeholders both within and outside (Chan, 1998 in Zutshi and Sohal, 2002). Surveys carried out by Banerjee (1998) in Zutshi and Suhal (2002) showed that most managers are in favour of environmental management albeit at different levels. These rising awareness can be traced back to the 1972 Stockholm conference and further by the Rio conference where environmental issues were brought to the forefront of the world. Environmental issues and concerns have thus become very important issues in organization dealings today. Organizations have come to realize the advantages they stand to gain by adopting EMS therefore initiating it within themselves. Some of the drivers within organizations include management, staff, parent company, and shareholders.

2.4.2 Market

The market these days, especially in developed countries is leading environmental stewardship among firms as most consumers now demand environmental loyalty before they purchase products. Environmentally friendly goods are being sought and they are willing to pay more for these products. The Europeans are now threatening to ban fish and flowers from East Africa due to the long distance they have to be transported thereby burning a lot of fossil fuel by airplanes. They intend to develop their own flower and fish farms to save on environmental pollution.

2.4.3 Social forces/Community

A community can demand the existence of good EMS in an organization that they feel is a threat to the environment and their existence. With increasing awareness on the environment these days, society is a force to reckon with as far as the environment is concerned especially in the developing countries. The activities of environmental non-governmental organizations (ENGOs) are also becoming very vocal and serve as a driver of EMS. In Kenya, local communities may demand environmental stewardship but without appropriate ENGO or institutional backing, this will be a mirage.

2.4.4 Financial

Financial institutions and insurance companies these days demand the existence of an effective management system like EMS in order to acquire insurance. Existence of such a system serves as an incentive for the company to be granted loan or insurance. Some international financial institutions like the International Monetary Fund (IMF) and the World Bank (WB) are some of such organizations. People as well demand the existence of such a system before they invest in such an enterprise. Financial law suits can also compel them to adopt EMS or their operations.

2.4.5 Regulatory Institutions

Research has shown that environmental initiative by organizations is driven primarily by external forces, such as regulatory pressures. Porter and van der Linde (1995b) argued that government regulations may serve in practice as a stimulus to both economic growth and cleaner production, if they are used as a business asset to gain market advantages over competitors. It has been reviewed in other literature however that neither positive nor negative effects of environmental regulation on competitiveness were easily detectable (Jaffe et al. 1995). Porter and van der Linde (1995b) concluded that firms seek to maximize 'resource productivity' in response to both regulatory and market pressures. Environmental regulation has been a major factor leading to firms putting into effect EM (Kolk, 2000). According to him, some firms with less environmental risks used to focus on compliance to regulations but as EM develops, firms started to move beyond mere compliance.

2.5 Approaches to Environmental Management Systems

Environmental instruments currently in existence include; regulations, incentives, disincentives, marketable permits, liabilities, training, information for firms, information for customers, voluntary agreements, and plans. These policies are mainly used in developed countries. These instruments proved effective in controlling pollution but only few are being used in Kenya. Table 1 below shows some environmental instruments in Europe.

Table 2.1: Product Oriented Environmental Polices/Instruments used in Europe

Direct Regulation	Economic	Compulsory Information	Voluntary Information	Voluntary Agreements
Prohibitions	National Product taxes	Compulsory labeling	Test reports	Legally obliging agreements
Admission	National product charges	Declaration of contents	Eco-labeling	Self commitments
Registration	Financial assistance	-	Quality marks	-
Information duties	Deposits/Refunds	-	Trade marks	-
Product standards	Marketable permits	-	Life cycle assessment	-
Guarantee periods	Public procurement	-	-	-
Obligations to take back	Leasing	-	-	-
Quotas of Returnable products	Product liability	-	-	-
Minimum quotas of waste materials	-	-	-	-
Recycling quotas	-	-	-	-
Advertising rules	-	-	-	-
Distribution restrictions	-	-	-	-
User obligations	-	-	-	-
User benefits	-	-	-	-

Source: Adapted from Scholl (1996), in Kolk, (2000)

Only two of these policies (direct regulation and economic) are mostly in operation in Kenya making industries to have a leverage to pollute the environment.

2.6 The Gap between EMS Theory and Practice

While much has been written on EMS theory, there is inadequacy of documentation and analysis of specific cases of EMS implementation (Kirkland and Thompson, 1998) for adoption. This has placed developing countries at a disadvantage. The practitioners of EMS just introduced the concept with no adequate dissemination of those ideas to the general public. The lack of communication of the ideas in EMS has a number of roots. One, the concept is new; second, the lack of communication can also be attributed to competition between its practitioners especially those in the developed countries, and

lastly, the lack of leadership on the issue (Kirkland and Thompson, 1998). According to Kirkland and Thompson (1998), the gap between EMS theory and practice has been exacerbated by the dominance of a structural approach to EMSs. EMS work has focused on the identification and description of components and frameworks but has not addressed how to put EMS elements together. ISO 14000 provides a list of resources needed in an EMS including general directions for blending of these resources but fails to describe techniques that may be used to blend the ingredients into a successful whole. The information is good but further information is needed to develop an effective EMS especially in Less Developed Countries (LDCs) like Kenya where the practice is not well known. Commitment by organizations is a vital component of the system but this has not been catered for in the ISO 14000 series (Kirkland and Thompson, 1998).

Some books attempted to guide readers through the process of developing EMS but these are all done in line with developed countries standards and examples with little attention being paid to that of the LDCs. Also, there is emphasis on large scale industries without corresponding structural change to accommodate small and medium scale ones which dominates the industrial scene in LDCs. There is need to involve and train local experts from LDCs to gain experience in current practice of EMS for adoption.

2.7 International organization for standardization

The International Organization for Standardization (ISO) is a non-governmental organization, dedicated to facilitating the exchange of goods and services worldwide through the promotion of international standardization. The organization was founded in 1946 with headquarters in Geneva, Switzerland. Today, representatives of national standards bodies from over 100 countries are members of ISO. ISO has developed international, voluntary, consensus standards for sectors. The abbreviation ISO for the International Organization for Standardization is not an acronym, but rather derived from the Greek word isos meaning equal. Although the standards are by nature voluntary, some governments choose to adopt parts or all of the standard in their legal

requirements. Each ISO published standard (including all of the standards included in the ISO 14000 series) must pass a six-phase approval process. ISO appoints a Technical Committee (TC) to spearhead the following approval process for each standard:

1. Proposal phase: Discussion of need for standard and implications of increased standardization.
2. Preparatory phase: Preparation of working draft of proposed standard through expert subcommittees.
3. Committee phase: Refinement of draft by all TC members until consensus is reached.
4. Enquiry phase: Circulation of draft to all ISO members bodies for feedback (5 months response time).Incorporation of feedback into final draft.
5. Approval phase: Circulation of final draft to all ISO member bodies for approval vote (2 months response time).
6. Publication phase: Publication of ISO standard.

One of ISO's most widely known standards is the ISO 9000 series, which provides businesses with a framework for total quality management across multinational lines. ISO 9000 emphasizes concepts of continuous improvement, strategic planning, and organizational goal setting. It was published in 1987, and currently over 100,000 organizations worldwide have adopted the ISO 9000 principles and gained certification. ISO 9000 served as an important stepping stone in the creation of ISO 14000.

2.8 The ISO 14000 Series

The series aims at providing guidance for developing a comprehensive approach to EM and for standardizing key environmental tools of analysis such as labeling, and life cycle analysis. ISO 14001 is the first in the 14000 series as shown in table 2.

Table 2.2: ISO 14000 series

Title	Standard
14001	Environmental Management System-Specification with Guidance for Use
14002	Environmental Management System-Guidelines on Special Considerations Affecting Small and Medium Scale Enterprises
14004	Environmental Management System-General Guidelines on Principles, Systems and Supporting Techniques
14010	Guidelines for Environmental Auditing- General Principles of Environmental Auditing
14011	Guidelines for Environmental Auditing-Audit Procedures Part 1: Auditing of Environmental Management Systems
14012	Guidelines for Environmental Auditing-Qualification Criteria for Environmental Auditors
14013/15	Guidelines for Environmental Auditing-Audit Programmes, Reviews and Assessments
14020	Environmental Labels and Declarations-General Principles
14021	Environmental Labels and Declarations-Environmental Labelling- Self Declaration of Environmental Claims-Terms and Definitions
14022	Environmental Labels and Declarations-Environmental Claims-Self Declaration of Environmental Claims - Symbols
14023	Environmental Labelling- Self Declaration of Environmental Claims-Testing and Verification Methodologies
14024	Environmental Labels and Declarations-Environmental Labelling-Type 1-Guiding Principles and Procedures
14031	Environmental Performance Evaluation-Guidelines
14032	Technical Report Type III –Environmental Management-Environmental Performance Evaluation-Case Studies Illustrating the Use of ISO 14031
14040	Life Cycle Assessment- Principles and Framework
14041	Life Cycle Assessment-Life Cycle Inventory Analysis
14042	Life Cycle Assessment-Impact Assessment
14043	Life Cycle Assessment-Interpretation
14049	Technical Report Type III-Environmental Management- Life Cycle Assessment-Examples for the Application of ISO 14041
14050	Environmental Management Terms and Definition
14061	Technical Report III-Guidance to Assist Forestry Organizations In the Use of ISO 14001 and ISO 14004

Source: Hewitt and Gary, 1998

It is aimed at supplementing environmental protection and the prevention of pollution in accordance with socio-economic needs. The first and only edition that was published in 1996 focused on ISO 14001 and the Environmental Auditing standards (ISO 14010 – 14012). TC 207 is now refining these standards in response to practical experience and will likely be releasing an updated edition in the near future. ISO 14001 is the only

certifiable standard in the ISO 14000 series. All other standards in the series describe supporting functions, and thereby maximize the effectiveness of the ISO 14001 EMS. However, the implementation of these supporting standards is not required for ISO 14001 certification.

(i) Environmental Management Systems - ISO 14001 and 14004

ISO 14001 (Environmental Management Systems: Specification with Guidance for Use) provides the guidelines for an ISO 14001 EMS. It provides companies with a framework for incorporating environmental considerations into every aspect of their operations. Rather than prescribing specific control technology or environmental performance indicators, ISO 14001 encourages continual improvement of a company's environmental performance. Also, it should provide an informative evaluation to potential customers through the internationally recognized ISO 14001 certification.

ISO 14001 was designed to be applicable to EMSs in all organizational sectors (including manufacturing, the service industry and even governmental agencies) worldwide. Although this comprehensiveness is necessary to achieve an internationally applicable standard, it also leaves ISO 14001 open to interpretation. Businesses seeking certification regard this partly as an opportunity, but primarily as a challenge.

(ii) ISO 14004 (Environmental Management Systems – General Guidelines on Principles, Systems and Supporting Techniques) is the companion piece to ISO 14001. It offers guidelines and examples of different methods for creating an EMS and meeting the requirements of ISO 14001. Although it complements ISO 14001, ISO 14004 is not certifiable.

(iii) Environmental Auditing - ISO 14010-14012

The Environmental Auditing standards were developed to achieve standardization in the field of environmental auditing and related environmental investigations.

(iv) ISO 14010 (Guidelines for Environmental Auditing: General Principles) defines key terms and describes general auditing objectives, criteria, and practices. The other sections were published in draft and are still being revised by TC 207.

(v) ISO 14011 (Guidelines for Environmental Auditing: Auditing Procedures Part I: Auditing of Environmental Management Systems) provides guidelines for the auditing process, including preparation, execution and reporting of the audit. ISO 14011 focuses on the EMS audit required in ISO 14001. ISO 14010 and ISO 14011 focus on first-party audits, although many of the guidelines provided may be adapted to second- and third-party audits.

(vi) ISO 14012 (Guidelines for Environmental Auditing): Qualification Criteria for Environmental Auditors of Environmental Management Systems describes the key qualification criteria for individual environmental auditors and may be applied to all three types of audits. ISO 14012 also contains important definitions, and two annexes that provide guidelines for evaluating an auditor's qualifications and for developing national registration bodies.

(vii) Environmental Labeling - ISO 14020-14024

The Environmental Labeling standards were developed to provide factual, comprehensible and internationally comparable information on the environmental aspects of products. Information on products may be provided (i) by the manufacturer or distributor of the product ('Self-declaration Claims') or (ii) by an independent third-party ('Practitioner Programs').

The Environmental Labeling requirements are divided into five ISO standards. ISO 14020 and ISO 14021 are useful to manufacturers, distributors and buyers, while ISO 14022 and ISO 14023 are primarily written for manufacturers and distributors that provide environmental information on their products and services. ISO 14020 (Environmental Labeling: Basic Principles for All Environmental Labeling) provides general guidelines for developing and evaluating environmental claims about products and services (Stapleton et al, 2001): ISO 14021 (Environmental Labeling: Self-Declaration of Environmental Claims – Terms and Definitions) documents current labeling techniques and defines key terms. ISO 14022 (Environmental Labeling Symbols) addresses the use of symbols in self- declaration environmental claims. ISO 14023 (Environmental Labeling: Testing & Verification Methodologies) determines the principles for testing and verification methodologies used to substantiate environmental claims (Stapleton et al, 2001)

(viii) ISO 14024 (Environmental Labeling: Practitioner Programs):Guiding Principles, Practices and Certification Procedures of Multiple Criteria (Type I) Programs lays out guiding principles, practices and criteria for multiple-criteria-based practitioner programs (such as Green Seal or Blue Angel). ISO 14024 is intended to help practitioner programs evaluate products and award approval to companies. Widespread implementation of the Environmental Labeling standards will allow consumers to make informed choices about the products they purchase and the companies they support. Companies that value the environment and limit the impacts of their products and services may benefit through an improved public image created by credible environmental advertising (Söderbom & Teal, 2004)

The "Green Seal of Approval" is granted by Green Seal, Washington, D.C. to products that it finds to cause less environmental harm than other similar products on the market. The Blue Angel is a German practitioner program, awarding environmentally responsible products (Sayre, 1996):

(ix) Environmental Performance Evaluation (EPE) – ISO 14031

ISO 14031 (Guidelines on Environmental Performance Evaluation) is a guidance document for evaluating the environmental performance of a company's activities, products, and services. ISO 14031 should serve as a basis for developing environmental performance indicators (EPIs) applicable to a company's specified impacts, objectives and targets (Spruill et al, 2001)

(x) Life Cycle Assessment - ISO 14040-14042

A Life Cycle Assessment (LCA) is a systematic method of determining how a product impacts the environment throughout its entire life cycle. The assessment evaluates all significant energy and material inputs and outputs associated with a product and its by-products, from the acquisition of raw materials to the product's ultimate disposal or reuse. LCA is hence an expansion of the more narrowly focused assessment of a product's environmental impacts as required by ISO 14001. The Life Cycle Assessment standards currently cover four areas:

ISO 14040 (Life Cycle Assessment: Principles and Framework) introduces the basic concepts for conducting a LCA. This standard provides a comprehensive overview of the practice, application, and limitations of LCA.

ISO 14041 (Life Cycle Assessment: Goals and Definitions/Scope and Inventory Analysis) describes the guidelines for evaluating the environmental inputs and outputs of product systems.

ISO 14042 (Life Cycle Assessment - Impact Assessment) provides guidelines for using LCA impact assessment to help firms evaluate their significant environmental impacts. ISO 14043 (Life Cycle Assessment: Improvement Assessment) contains information on improving the total environmental performance of product systems. (Some have

suggested that this last section would be more useful if it addressed interpretation of LCA results)

(xi) Environmental Product Standards - ISO Guide 64

ISO Guide 64 addresses the incorporation of environmental aspects into product standards. It is directed at individuals or organizations involved in the drafting of product standards. ISO Guide 64 is designed to minimize the adverse effects of specific requirements of a product standard (set by a standard-setting body) that may cause an environmental impact.

2.8.1 History and Development of ISO 14001

According to ISO (1996), the main purpose of the standard is to provide a systematic, documented, consistent procedure that provides clear evidence of the relationship between organizations's publicly stated environmental policy and the implementation of this policy in practice. A major antecedent that led ISO to develop standards is traced to the British Standards Institute (BSI) publication of the three part quality series-BS 5750. The success of this standard led to the adoption of BS 7750, the first formal systematic and standardized approach to environmental management (Hewitt and Gary, 1998). The BS 7750 was published in 1992 and it was a voluntary management standard. Countries started to produce their own EMS. An initiative began regionally within the EU and the EMAS was negotiated with industry, environmental groups and other interested stakeholders within the environmental field. It was created for businesses interested in voluntary certification to an EMS within the EU. The increase in national standards on the environment compelled ISO to initiate moves on EM standards. ISO embarked on creating standards that are not essentially technical or scientifically based neither limited to a specific region. The success of ISO 9000 led to the development of other standards. It is generally believed however that, the ISO 14000 series emerged as a result of both the Uruguay round of the General Agreement on Trade and Tariff (GATT) negotiations and the UN Rio Summit on the environment held in 1992 (Hewitt and Gary, 1998).

2.8.2 The rational for developing ISO 14000 series

The development of the ISO 14000 series was stimulated by two important agreements:

- The General Agreement on Trade and Tariffs (GATT), published in 1986, urged participating parties to foster international trade and prevent the imposition of trade barriers. The Agreement recommended that no standard should be adopted if it restricts international trade more than necessary to achieve the policy objective.
- The Rio Agreement, adopted in 1992 by the parties to the UN Conference in Rio de Janeiro, requires a commitment to responsible environmental management and global sustainability.

A regional environmental management standard, such as EMAS, may conflict with GATT if it creates a trade barrier for non-certified companies. In response to this potential conflict, the ISO established a Strategic Advisory Group for the Environment (SAGE). SAGE assessed the need for an international EMS standard that would encourage responsible environmental management without violating GATT. As a result, Technical Committee 207 (TC 207) was formed in 1993 to develop the ISO 14000 Series (Patton & Baron, 1995).

One of the prime motivators for industrial support of the ISO 14000 series is its potential to facilitate trade by replacing the increasing number of national and regional environmental standards, some of which had become quasi-trade barriers. Any environmental standard can become a trade barrier if it is used to discriminate against a potential trade partner. ISO 14000 is an international consensus document that is intended to remove trade barriers by unifying approaches to eco-labeling, environmental management, and life cycle assessment. ISO 14000 was also designed to influence international development and commerce by building a worldwide consensus that there

is a need for a common terminology for environmental management systems (Prakash, 1999).

With the acceptance of ISO 14001 as an international EMS standard, and the increasing number of certified firms worldwide, there is a danger that ISO 14001 may become a barrier to trade itself, if it promotes preferential selection of certified companies over non-certified ones. Since one of the initial rationales for developing ISO 14000 was to provide internationally recognized standards that prevent the establishment of trade barriers, a concerted effort has to be made to ensure that certified firms are rewarded for their commitment, while non-certified firms are not penalized for not complying with the voluntary standard (Porter & Claas, 1995).

2.9 ISO 14001 Developments throughout the World

There is mixed results with respect to ISO 14001 development throughout the world. ISO 14001 achieved success in Europe as a result of the development of other EMS like BS 7750 and EMAS. These standards laid strong foundation for the take off of ISO 14001. In addition, government institutions through the EU promoted the diffusion of EMS in Europe, a phenomena lacking in most developing countries of Africa and Latin America. Asia has large MNCs as compared to Africa and Latin America. These large companies are pushing ISO 14001 down their supply chain (Roy & Vezina, 2001).China is the leading developing country with large certification to ISO 14001. Due to its large population many companies established here. These companies are subsidiaries with their parent companies in Europe. To do business with these companies, one has to be certified to the standard. Brazil is also following the same step as China in getting certified, however, this is not the case in other LDCs as they are doing business on a small scale and are mainly import substitution industries. There is a positive relationship between the level of industrial development of a country and ISO 14001 certification. Developed countries have embraced EMS as compared to LDCs (Raines, 2002).

2.10 Current situation of ISO 14001

ISO 14001 is a specification standard, i.e. it consists of a set of requirements for establishing and maintaining an environmental management system. By complying with these requirements an organization can demonstrate to the outside world that is has an appropriate and effective management system in place. One way in which a company can demonstrate that is by 'self-declaration'. This means that the company checks its own compliance with the requirements. However, a company may feel that it carries more weight with the outside world if its compliance with the requirements of ISO 14001 is checked by an independent third party. This third checking is known as certification (Welford, 1998).

Up to the end of 2002, at least 49,462 ISO 14001 certificates had been issued in 118 countries, an increase of 12,697 certificates (+ 34,54%) over the end of 2001 when the total stood at 36,765 in 112 countries (ISO, 2004). Another survey shows the increase of this number is continuous in the following years. Up to January of 2006, 103,583 certificates had been issued around the world (ISO 2006). The accreditation bodies in Kenya are SGS, Bureau Veritas and the Kenya Bureau of Standards.

2.11 Worldwide perspectives on ISO 14001

2.11.1 Western Europe

In the early 1980's Great Britain, Scandinavia and the Netherlands initiated environmental management strategies in Europe by adopting the compliance audit practices from the U.S. By the early 1990's, the focus had shifted from environmental compliance auditing to designing comprehensive environmental management systems. The three major certifiable standards (BS 7750, EMAS, and ISO 14001) are all supported in Europe.

(i) Great Britain

ISO 14001 certified companies in Britain span a broad spectrum of industries and business sectors, including chemical, transportation, construction, paper and printing, petroleum, electronics and computer hardware, furniture, utilities, and even the Hereford City Council. There is a general trend for British ISO 14001 certified companies to be strongly involved in international trade (many multi- nationals are certified) and to have a long-standing commitment to environmental management. Out of the 48 ISO 14000 companies listed by Quality Network, 47 are also certified for BS 7750, and 4 are certified for EMAS (certification for both BS 7750 and EMAS was generally obtained previous to ISO certification).

(ii) Germany

ISO 14001 certification in Germany includes all industries, although the transportation and communication industries have the largest number of certified firms. The majority of certified companies are medium in size with 10 to 200 employees. Currently, Germany ranks second worldwide (together with Britain) in number of ISO 14001 certified companies. Germany is also home to 1,670 EMAS certified companies, more than ten times that of any other European country. The enthusiastic response to ISO 14001 certification is partly explained by the fact that certification for the stricter EMAS standard facilitates ISO 14001 certification. All ISO 14001 certified German companies are also EMAS certified. There seems to be more reluctance, however, for EMAS certified companies to adopt ISO 14001 as well. The general motivators for the widespread implementation of EMS standards in Germany seem to be “good corporate citizenship”, as well as a response to consumer demands.

(iii) Scandinavia

Scandinavian countries are also becoming increasingly enthusiastic supporters of ISO 14001. In December1998, there were 311 certified companies in Sweden, 250 in Denmark, 120 in Finland, and 60 in Norway. Similar to trends in Britain, ISO 14001 certified companies often have a long-standing record of environmental commitment.(Some Swedish companies published their first environmental policy statements as early as the late 1960's.) The Scandinavian approach to environmental management seems to be very holistic – several companies have extended the ISO 14001 principles from their operational processes to transportation and on-site catering business components. The range of industries appears to be largely limited to forest industry and wood processing operations, the chemical industry, energy production, and the telecommunications sector.

(iv) The Netherlands

In contrast to the motivators in neighboring European countries, environmental protection efforts in the Netherlands are strongly driven by the Dutch government. Recently, an "Internal Environmental Care System" (IECS) was introduced, requiring the largest 10,000 companies in the country to implement a specific EMS standard. The IECS is designed to be proportional to the size of the company involved; only the largest companies will be required to have a system comparable to EMAS or ISO 14001.

(v) Switzerland

ISO 14001 certified companies in Switzerland, similar to Germany, are primarily medium-sized and span a wide range of industries including transportation, construction, electronics and optics, food and beverages, printing, chemical, and metal industries. Unlike in Germany, however, none of the 292 ISO 14001 certified companies in Switzerland are also EMAS certified.

2.11.2 Asia - Pacific

Japan leads the world in terms of ISO 14001 certified companies (19% of world total), and together with Korea and Taiwan accounts for most of the ISO 14001 certified companies in the Asia-Pacific region. Other prominent nations in the region have been relatively slow to implement ISO 14001. Thailand, Indonesia, Singapore, Malaysia, Hong Kong, India and China collectively contain only approximately 6 % of ISO 14001 certified companies worldwide.

(i) Japan

For Japanese firms, the driving forces for certification are the perceived additional competitive advantages associated with environmentally responsible business, and the increased access to new markets. The most prominent supporter of ISO 14001 in Japan is the electronics industry, followed by the machinery manufacturing industry. Japanese companies have watched the development of the ISO 14000 Series closely, and are increasingly interested in ensuring that Japan's national standards are compatible with internationally adopted standards. Japan established the Environmental Management Standardization Study Committee in May 1992, as the Japanese representation to TC 207. The Committee resides within the Japanese Industrial Standards Committee (JISC), and is now taking steps to adapt the Japan Industrial Standards (JIS) to comply with the ISO 14000 Series. Also, local governments are studying how to replace their current "command and control" approach to environmental regulation with ISO 14000 principles.The Japan Accreditation Board for Conformity Assessment (JAB) is responsible for authorizing Japanese registrars for ISO 14001 as well as other standards. The JAB is also responsible for authorizing and overseeing the organizations that train and certify environmental auditors (Mihyo, 2003).

(ii) Korea

Because of Korea's strong industrial economy, its government has pursued ISO 14001 since 1994. The motivations for Korea's interest in ISO 14000 are trade implications and a desire by firms to improve their public image. Korea has adopted an Environmentally Friendly Companies Act that encourages companies to provide information on their environmental performance. The act offers a basis for improving environmental performance and dissemination of information on progress to government and the public. Compliance appears motivated by a desire to obtain ISO 14001 certification in the future (Munasinghe, 1999).

(iii) Taiwan

Taiwan has shown considerable support of sustainable business practices. The China Productivity Center currently provides government-subsidized management consulting to Taiwan industry and is assisting industries in implementing ISO 14001. The Taiwan Environmental Protection Agency promotes the "Green Mark" (eco-labeling) system, and the Bureau of Foreign Trade collects information to track ISO 14001 implementation .In addition, the Ministry of Economic Affairs (MOEA), the central agency for economic and industrial planning and program implementation within Taiwan, supports an inter-ministerial committee to study ISO 14000 and its incorporation into Taiwan's existing national standards system, the China National Standards (Patton & Baron, 1995).

(iv) Indonesia

In contrast to Japan, Korea and Taiwan, Indonesian industry has shown a low level of interest in ISO 14000, which is surprising given its expansive export economy. Recently though, a number of industry associations and chambers of commerce have been offering seminars and workshops on ISO 14000. Also, the Ministry of Industry and Trade is examining ISO 14000 as a mechanism to assist industry in implementing eco-

labeling and pollution prevention practices. A possible signal of Indonesia's increasing environmental awareness and need for improved industrial environmental performance is "Proper Prokasih", a business performance rating program initiated by the Indonesian Ministry of Environment in 1995. "Proper Prokasih" is a publicly announced rating system of company environmental performance and compliance with regulations. It is the first central government program in the world to publish a single index of environmental performance.The program's main objectives are to increase environmental compliance by industry, create incentives for companies to strengthen their environmental management systems, and to prepare Indonesian companies for ISO 14001 certification (Pickering &Owen, 1997)

(v) Malaysia

Similar to Indonesia, Malaysia's government sector is now aggressively promoting ISO 14000 after a slow start. The Ministry of International Trade and Industry (MITI), the lead agency for industrial development and international trade in Malaysia, asserts that environmental management is a major policy concern. Currently, MITI is warning industry that ISO 14001 certification will likely become a precondition to export growth. The recently privatized Standards and Industrial Research Institute of Malaysia has been charged with leading the ISO 14000 efforts in Malaysia and will be the country's registrar. The Malaysian International Chamber of Commerce (MICCI) is also taking an active role in ISO 14001 implementation. Because its large corporate members believe that they must be serious about ISO 14001, MICCI has a thorough training program for corporate officers.

(vi) China

Although implementation of ISO 14001 has been slow in China, government officials seem to be increasingly embracing the standard. In 1996, the State Bureau of Environmental Protection designated the coastal trade city of Xiamen for the first ISO 14001 pilot program, with the aim to certify 20 pilot companies. In 1997, the Chinese

government established an environmental management and auditing certification center to provide ISO 14000 training. China plans to incorporate ISO 14000 into its regulatory requirements sometime in the future.

(v) India

Although industry associations in India are beginning to show interest in ISO 14001 out of concern that the standard will become a critical factor in export trade, stronger national support will be necessary to accelerate implementation.

2.11.3 North America

(i) Canada

Canada's industry is showing an increasing interest in the potential effects of ISO 14000, especially within the arena of international trade and customer expectations. To date, 90 Canadian companies have attained ISO 14001 certification. The Environmental Regulatory Affairs Directorate - Industry Canada notes that Canadian firms seem particularly interested in meeting customer demands for companies' adherence to environmental standards, and in exploring the international trade benefits of ISO 14001 certification. The Standards Council of Canada (SCC), created by the Canadian Parliament in 1970, has taken a prominent role in advocating ISO 14000. (The SCC is responsible for accrediting Canadian organizations to serve as national registrars for ISO certification.) The SCC, which is composed of government and non-government members, acts as both the official Canadian representation to ISO and the lead secretariat of the TC 207. The SCC has played a vital role in boosting the credibility of the ISO 14000 Series throughout Canada by developing a National EMS Accreditation Program, which follows the ISO 14000 principles. In addition to the SCC's support, Canada's legal system is also beginning to promote ISO 14001. For example, in a 1996 court ruling for a company that had failed to comply with environmental laws, the judge

mandated the firm to attain ISO 14001 certification in lieu of compensatory or punitive damages.

(ii) United States

In the United States, attitudes toward the ISO 14000 Series range from distrust to enthusiasm, with an increasing shift towards the latter as a better understanding of the Series evolves. However, government agencies, the corporate sector, and the environmental community still haven't reached a consensus regarding the Series' potential implications. The EPA's Office of Reinvention is currently developing a database with information on EMSs gathered from various EPA pilot projects across the nation. The database will help the EPA evaluate the effectiveness of EMSs, including ISO 14001, in terms of six criteria: environmental performance, compliance, pollution prevention, environmental conditions, costs and benefits to implementing facilities, and stakeholder participation and confidence.

Meanwhile, the regulatory and legal implications of ISO 14001 certification continue to present an issue of debate within the U.S. A large number of environmental advocacy and non- profit organizations are opposed to ISO 14001, because they believe the standard will erode the strength of current environmental regulations. Essentially they fear that the EPA may grant regulatory relief to certified firms. The misperception that ISO 14001 certification enables businesses to become eligible for regulatory relief, rather than regulatory streamlining i.e. the improvement of industry-government relations, and an increase in regulatory efficiency has caused much confusion and debate. The majority of U.S. firms generally perceive ISO 14001 as an innovative set of guidelines for developing company-specific EMSs. However, ISO 14001 certified U.S. companies are becoming increasingly interested in requiring environmental evaluations of their suppliers. This could lead to a significant increase in the number of ISO 14001 certified firms in the U.S. in the near future. The U.S. representative to TC 207 is ANSI, a non-profit organization that includes representatives of several governmental agencies,

including the EPA, the Department of Energy, and the Occupational Safety and Health Administration.

2.11.4 Central and Eastern Europe

The transitional economies of Central and Eastern Europe contain only one percent of ISO 14001 certified companies worldwide. Poland and Hungary, who are attempting to forge close ties with the European Union, are leading the region in implementing ISO 14001, but certified firms are still few. There is only one certified company in Russia to date. Disarray in the legal system, associated with the transition to a market-based economy, is the primary reason for slow implementation of ISO 14001 in this geographical area. The US Agency for International Development (USAID) is supporting programs to increase Russia's capacity to deal with its pervasive environmental pollution problems. In October 1997, USAID sponsored an ISO 14000 training program for Russian decision-makers. Comments by attendees of the conference suggested strong suspicion that any attempt by the government to require ISO 14001 would only be a means to raise new revenues from the already heavily taxed Russian industry. Overcoming this suspicion will be a major obstacle before ISO 14001 can be successfully implemented in Russia.

2.11.5 The rest of the World

Latin America, Africa and the Middle East together account for less than 3% of ISO 14001 certified companies worldwide. Within these regions, certified companies are predominantly located in Brazil, Argentina, Mexico, and South Africa. Mexico and Argentina have integrated ISO 14000 into their regulatory scheme. In a joint effort with government regulators, the World Bank is supporting a pilot program in Mexico to transfer approaches to ISO 14001 implementation from large companies to their suppliers. Institutional weaknesses, lack of skilled manpower, and inadequate training facilities have been suggested as the major obstacles to implementing environmental management systems in these regions

2.12 Criteria of a suitable EMS (ISO World, 2008).

1. Easy to start implementation

All those who plan to implement an EMS face a problem of starting it. It is especially difficult for smaller organizations which usually are less experienced in environmental management systems. An easy start can eliminate hesitation and increase involvement.

2. Costs should be relatively low

Pursuit of profit is the ultimate aim of business. Therefore, decisions on EMS implementation largely depend on cost. Cost here means not only money but also time and human resources which are all very limited. Therefore, lower costs can definitely attract more potential participants.

3. Benefits should be relatively high

One of the reasons for EMS implementation is the benefits EMS can provide to its users. Hilary 1999 categorized the benefits of EMS implementation for organizations as organizational, financial, people, commercial, Environmental and communication benefits. Different EMS's can provide different benefits and the more the benefits the more the participants.

4. Environmental performance should be continuously improved

The ultimate aim of EMS is to control the participant's environmental impacts (Welford, 1998). Therefore implementation of an EMS is not just establishing an EMS and maintaining it but using the EMS to improve the company's environmental performance continuously. The one which meets these criteria better is more suitable for business.

5. Legal compliance

Ensuring legal compliance is one of the basic functions of a successful EMS. Businesses through EMS implementation should reduce the chances of conflict with environmental legislation and regulation and thus make the company work more efficiently

6. Implementation process should be easy to control

EMS implementation is easy to be interrupted due to some more important factors such as economic profits. Therefore, flexibility is very important for a successful EMS. A clear structure of each stage of EMS implementation process and sufficient control to each stage is preferable to participants.

7. Easy to get assistance

Most of the companies find it difficult to solve all the problems during the EMS implementation. It is necessary to get some external assistance Hence, a good EMS needs a good mechanism to guide its user and easy to obtain external assistance

8. Mature accreditation system

Mature accreditation system is necessary in order to make sure of the creditability of EMS implementation. Creditability is receiving more and more concerns from EMS participants, stakeholders as well as the competitors (ENDS Report 353, 2004). With the support and guidance from accreditation bodies, EMS implementation is carried out properly and be accepted by more companies.

9. Compatible with other systems

In additional to EMS, there are several other management systems such as quality management systems and health and safety management systems. Studies show that EMS's compatibility with other systems can cause more involvement (Best Report,

2004). Besides, compatibility with other EMSs also needs to be considered because a better compatible system has more opportunities.

10. Easy to diffuse

Diffusion here means whether an EMS is easy to be used in a certain industry sector. Studies have already focused on the implementation of EMS in certain industry sectors on the assumption that such approach is better for the involvement of EMS implementation.

2.13 ISO 14001 certification and related auditing

2.13.1 ISO 14001 certification process

Prior to seeking ISO 14001 certification, a company must implement an EMS or enhance its existing EMS in accordance with the ISO 14001 standard. A company must also conduct an internal audit to confirm that its EMS meets the requirements of the standard, or to identify any need for change and initiate necessary corrective action. The formal process of obtaining ISO 14001 certification entails three-steps, performed by an external, accredited auditor. All accredited auditors are associated with a national registrar. Accredited auditors conduct the ISO 14001 Certification Audit and determine the status of the company's EMS. The registrar conducts ISO 14001 auditing training for auditors, stipulates certain auditing practices, monitors its auditors, and assigns auditors to companies seeking ISO 14001 certification.

The first step, the Third-Party Pre-Assessment, is an informal evaluation of a company's EMS. The aim is to identify and correct any obvious non-conformity (Cascio et al., 1996). The practical application of this concept is somewhat controversial, since EVABAT specifies neither the exact point at which the technology has to be "available", nor does it set clear criteria for defining economic viability.

The second step, often informally referred to as a "Desktop Audit," consists of a thorough review of all EMS-associated documentation to ensure their compliance with the ISO 14001 requirements.

Finally, the Certification Audit is a formal and highly structured review of the company's entire EMS and its compliance with ISO 14001. The Certification Audit has three possible outcomes

1) Approval – the EMS complies with the ISO 14001 standard
2) Conditional Approval – minor non-compliance, deadlines for corrective actions will be agreed upon in the closing meeting and must be documented
3) Disapproval – major non-compliance, including implementation of the EMS (Johnson, 1997)

2.13.2 Auditing beyond certification

The certification process is usually followed by formal, third-party surveillance audits to ensure the continued compliance with the ISO 14001 standard. The nature and frequency of the surveillance audits are not defined in the Series, but vary with the terms of certification specific to each company. For example, surveillance audits may be performed regularly throughout the period during which a certification is valid, they may constitute a reassessment upon expiration of the certification, or they may serve as a monitoring tool for indefinitely valid certifications. Often misunderstood, a (EHS) Compliance Audit confirms a company's compliance with regulatory statutes and permit requirements. Neither the EMS audit, nor the ISO 14001 Certification Audit can be substituted for a Compliance Audit. (Raines, 2002).According to Roy and Vezina,(2001),Audits can be classified according to the party that is performing the audit:

- First-party audit: An audit conducted within an organization by internal parties. For example, an Internal EMS Audit

- Second-party audit: An audit used in a contract situation. For example, an informal audit performed by an ISO 14001 certified company to evaluate the EMS performance of a certified supplier
- Third-party audit: An external audit conducted by an accredited auditor in order to determine the certification status of a company's EMS. For example, the ISO 14001 Certification Audit

2.14 Benefits

Generally, businesses derive benefits from implementing an EMS because it provides a holistic framework for identifying, quantifying and facilitating positive action to achieve environmental improvements and tangible business benefits. (Herbert, 2004). These benefits are business and context specific and may be direct, (e.g. cost savings); indirect, (e.g. avoided liabilities) or strategic, (e.g. new business possibilities) (Kolk, 2000).

2.14.1 Direct benefits

The most instantly observed and frequently cited benefit is a reduction in overhead costs (Hillary, 2000). This is realized by the efficient management of energy, water, packaging and transport and by reducing the amount of waste and effluents (Kolk, 2002; Netherwood, 2002; Herbert, 2004; Barwise, 2004). Barwise (2004), suggests that the introduction of an EMS into many organizations is often the first time that issues such as energy efficiency and waste reduction have been raised and identified in performance management. There are many anecdotal examples in literature demonstrating this. For example, Herbert (2004) describes a number of UK firms that demonstrated significant cost savings following EMS implementation. Schaltegger et al., (2003) citing a study carried out by the ISO in 1999, showed that more than 60% of 500 companies surveyed demonstrated payback periods of less than 12 months on their investment in an EMS. Indeed, cost-reduction benefits are frequently used to advertise the effectiveness of

EMSs and demonstrate that the environment is a business issue that needs to be managed effectively (Sunderland, 1999).

2.14.2 Indirect benefits

Indirect benefits, as they do not directly influence the financial performance of the organization, are harder to quantify. Indirect benefits accrue by avoiding costs associated with environmental damage and the minimization of environmental and therefore business liability. The EMS model achieves this by developing a systematic process to address and control environmental impacts and risks relevant to an organization's activities (Sunderland, 1999). The benefits of EMSs include not only direct cost benefits and environmental gains, but also showing legal and regulatory compliance, demonstrating environmental commitment to stakeholders, identifying present and future environmental risks, reducing public liability insurance costs and creating better access to financial insurance (Herbert, (2004). Kolk (2000) includes the following indirect benefits of an EMS: avoiding clean up costs, attracting new staff, satisfying current employees and improved relationships with regulators**.**

2.14.3 Strategic benefits

Schaltegger et al. (2003) defines strategic planning as the long term goals of a business. It identifies the business fields in which a company wants to be active, the competencies it needs to acquire and the resources needed in order to enter the market and compete successfully. There is a concern that EMSs can reduce an organization's competitiveness, through additional costs and administrative burdens. However, EMSs provide competitive advantages through three strategic approaches:

- Cost Leadership
- Product Differentiation
- Market Segment Focus

(Porter, 1980; 1985; 1999 cited by Schaltegger et al., 2003).

Cost leadership is obtained through strategic use of the direct benefits discussed above. By reducing input costs, organizations reduce product costs, which can be passed on to customers. Product differentiation in an environmental context aims to directly highlight the environmental problems of products in the market (Schaltegger et al., 2003) and to imply that an organization's product addresses these issues to which its customers attach value (Kolk, 2000). This is closely linked to a market segment approach, where a specific portion of the market is targeted: for example environmentally conscious consumers. There is evidence suggesting customers attach a value to the increased environmental performance offered by an EMS. For example, Darnall et al (2000) recognized that some businesses and government procurement officers favour ISO-certified organizations in the supply chain.

2.14.4 Other benefits

(i) Improved relationships with regulators

EMSs, particularly accredited ones, send a strong signal of environmental commitment to regulators (Darnall et al., 2000). For example, the UK Environment Agency advocates a reduction in regulatory oversight if a documented EMS is in evidence, although it stresses that an EMS does not replace the need for compliance (Herbert, 2004). Indeed, Sunderland (1999) suggests that "EMSs may be encouraging a new regulatory regime between industry and government based upon trust and self- regulation."

(ii) Employee benefits

Employees are seen as a key stakeholder in environmental issues. With increasing environmental awareness; a significant number of graduates are evaluating an organization's ethics when choosing an employer (Polgreen, 2005). EMSs are perceived to improve existing employee motivation, awareness and qualifications (Hillary, 2000).

However, this benefit is contentious: Moxen and Strachan (2000) suggest that these claims ought to be treated with some scepticism and Tinsley and Pillai (2006) suggest that employees are unlikely to be the primary driver in all but the most socially conscious businesses.

(iii) Organizational image and reputation

Organizations frequently report that the implementation of an EMS frequently leads to enhanced dialogue and relationships with key stakeholders, leading to an enhanced public image (Hillary, 2000). Tinsley and Pillai (2006) suggest that many industrial sectors are becoming aware that businesses and the general public prefer to deal with companies that are able to demonstrate a willingness to operate in a responsible way. It is speculated that concerns around reputation depend on an organization's profile and its stakeholder relationships (Barwise, 2004).

2.15 Barriers and disadvantages of EMS implementation

2.15.1 Barriers to the implementation of standardized systems

Stone (2000), cited in Tinsley and Pillai (2006), suggest that the following elements of an organization, shown below in Table 3, influence EMS implementation:

Table 2.3: Elements of Organization that can impact on implementation of EMS

Elements of an Organization	Includes
The structure of the organization	Department, subsidiaries, management hierarchy
The environment in which it operates	Geographic, economic climate, legislative frameworks
The decision-making process or management of the organization	Democratic or authoritative management styles, management hierarchy
The people within the organization	Personal beliefs, priorities, level of education
The general way in which change is viewed and implemented	Management style, management hierarchy, organizational culture (proactive, reactive or passive)

Source: Stone (2000) cited in Tinsley and Pillai (2006)

Tinsley and Pillai (2006) also stress the importance of senior management commitment, recognizing that the isolation of early EMSs was partly due to senior management, who expected environmental management to adapt to a business' prevailing culture.

2.15.2 Disadvantages of standardized systems

There is considerable debate in literature over the merits of accredited EMSs. In this section, the discussion focuses on ISO 14001 as the most commonly used standard. ISO 14001 is often seen as an entry-level standard; Bell (1997) implies that it is not 'state of the art', rather it is intended for widespread use. Sunderland (1997) supports this suggesting that EMS standards are of less value to 'leading-edge' companies, arguing that companies incur large financial and administrative burdens adopting the formal management system required by the standards, but find that this does little to improve their environmental performance. Whilst ISO 14001 obliges a company to continually improve its management system and improve environmental performance (Hortensius and Barthell, 1997), ISO 14001 is a conformance standard such that companies with very different performance objectives and levels of performance can be certified (Sunderland, 1997; Gleckman and Krut, 1997). Gleckman and Krut, (1997), argue that the historical foundation of the ISO is in the provision of technical and engineering

standards for industrial procedures. Moxen and Strachan, (2000) support this stating ISO 14001 offers a hierarchical approach to management rather than encouraging flexible and participatory decision making. Gleckman and Krut (1997) are also critical of ISO 14001 for failing to advance major international environmental agreements, such as the Convention on Biological Diversity, arguing that ISO 14001 focuses exclusively on compliance with applicable laws and legal obligations. Bell (1997) disagrees, saying that these agreements are incorporated into national laws and ISO 14001 provides a framework for managing these obligations. Sunderland (1997) suggests that ISO 14001 falls short of the requirements of EMAS and is seen in Europe as a less stringent standard. Under ISO 14001, performance reports may be kept confidential making stakeholders wholly reliant on the corroboration of auditors and accreditation bodies (Gleckman and Krut, 1997). EMAS offers an obvious benefit through the annual verification and external reporting of performance data (Schaltegger et al, 2003; Sunderland, 1997; Hillary, 2000). Therefore EMAS offers added benefits to an organization keen to be honest about its environmental performance (Netherwood, 2002).

2.15.3 EMS in smaller organizations

Small and Medium Sized Enterprises (SMEs) businesses have difficulties in implementing EMSs. Tinsley and Pillai (2006) suggest these difficulties may be so great that SMEs may never realize the benefits of an EMS. SMEs are difficult to define, the most commonly used operational definition e.g. for access to funding is provided by the European Commission, where an SME is considered to have fewer than 250 employees and a balance sheet total of €27 Million or less (CEC, 1996). Hillary (2000) argues that whilst this definition is useful for operational reasons, it fails to capture the diversity of organizations in this sector. Hillary (2004) summarized 33 studies of the SME sector and demonstrated the benefits of an EMS were largely consistent with those mentioned above The barriers are traced back to resource (financial, time, skill) availability and

arise because many reports present best practice case studies and seek to 'sell' EMSs to the SME sector (Hillary, 2004).

2.15.4 Environmental Management in non-industrial organizations

ISO states categorically that ISO 14001 is intended to apply to all types and sizes of organizations and to accommodate diverse geographical, cultural and social conditions (ISO, 2004). However, a number of authors argue EMS standards were designed for manufacturing industries in the private sector (Emilsson and Hjelm, 2004; 2005; Nóren and von Malmborg, 2004). Curkovic et al. (2005) suggest that where there is less perceived environmental impact and fewer environmental regulations, such as in non-industrial situations, EMSs are less likely to be adopted and, when adopted, are more varied in nature. However, there has been increasing adoption of standardized EMSs in non-industrial organizations and this section reviews how ISO 14001 has been implemented in those organizations.

2.15.5 EMSs in local authorities

There has been an expansion of EMS implementation in local authorities in response to a number of drivers. Emilsson and Hjelm (2005) studied EMS adoption in local authorities in Sweden and the UK and suggest the extensive use of EMSs in the private sector has influenced the public sector to follow suit. In earlier work, the authors demonstrated the reasons for implementing an EMS differed between Sweden and the UK. In Sweden the drivers were internal, aiming to strengthen environmental efforts in the local community; whereas in the UK they were attributable to external influence from national government (Emilsson and Hjelm, 2004). Cockrean (2000) demonstrates additional drivers for EMS implementation in local authorities in New Zealand to:

Provide evidence of due diligence

- Help identify cost savings in resource use and waste management

- Improve resource consent management processes
- Act as an example to local businesses and resource consent applicants
- Assist with legislative compliance

2.15.6 EMSs in universities

There has also been an emergence of EMSs in universities (Barnes and Jerman, 2002). The motivating factors identified were internal in nature:

- A desire by students and teaching staff to include 'sustainability' into day-to-day activities, linked to some specific environmental concerns.
- An interest in cost savings by administrators.
- An attempt to co-ordinate a number of small independent sustainability initiatives.

In another study of EMSs in Universities, Savely et al. (2006) suggest the US Environmental Protection Agency's expectation that universities and colleges should conform to the same standards it expected of manufacturing industries was driving their EMS adoption.

2.16 Advantages and disadvantages of accreditation

The advantages and disadvantages of EMS accreditation are shown in Table 4 below. These are also context specific depending on the choice of standard.

Table 2.4: The advantages and disadvantages of EMS accreditation

Advantages of an Accreditation
▪ Provides a structured framework to follow for EMS implementation. ▪ Demonstrates independently verified commitment to environmental management. ▪ Improves organizational image.
Disadvantages of Accreditation
▪ Can be seen as an entry level as a conformance approach does not distinguish organizations with superior environmental performance. ▪ Provides a hierarchical approach to management. ▪ Relies on inclusion of international environmental agreements in national laws.

2.17 Misconceptions about ISO 14000

Although ISO 14000 is heralded by some as the great solution to environmental problems world-wide and as an effective way to ensure environmentally responsible production, there are many misconceptions about just what it is and how it works. For instance, ISO is not the organization that issues a certificate acknowledging compliance with ISO standards. This service is provided by organizations independent of ISO; these organizations go through a certification process themselves to enable them to be certifiers.

The quality and legitimacy of the audits is questioned by those who point out the inevitable variability there will be among different nations' auditors (Davy, 1997). As well, state environmental legislation varies widely throughout the world yet forms the basis for objectives and targets connected to ISO 14001 environmental policies (Lamprecht, 1997). Thus, ISO 14001 certified organizations in areas where environmental regulations are strict could be perceived as being on par with ISO 14001 certified organizations in a region where there may be no environmental regulations in place. Given these possible inconsistencies, some claim that it is a false impression that ISO 14000 is a ‘standard’ and ‘international’ (BEC, 1997).

Another important misunderstanding is that ISO 14000 is not a label that signifies a 'green' or 'environmentally friendly' product or service. ISO certification is attached to the organization or a division within a firm and means only that the organization has followed the prescribed steps for implementing an environmental management system. The objective is to give the customers some confidence that the organization with which they are dealing has considered the environmental impacts in its production of goods and services.

2.18 Problems with ISO 14001 certification

As with any business activity, adopting ISO 14001 brings benefits and loss. The standard has been criticized by a number of companies (Yiridoe et al, 2003). One of the major barriers to certification and development of an effective EMS is that, companies become vulnerable to legal claims as they develop EMS. The development of an EMS creates documentation on environmental performance and these documents can become a basis for court action against an organization that does not go according to its targets (Kolk, 2000). These litigation problems can create caution on the development of an EMS. The good side however is that, the standard does not mention reporting of environmental performance by companies. Auditors may have access to information on performance and can leak such information out.

Another weakness of the standard is its emphasis on conformance as against performance. Welford (1998) said that, an organization sets its own environmental objectives and targets for improvement. It can thus improve its environmental performance as little as much, as fast or as slow as it likes. Likewise, Shayler et al, (in Welford, 1998) echoes the view that the targets set by an organization can be an environmental tokenism rather than a solid commitment to decreasing environmental impacts. The authors concluded that a self-regulated EMS like ISO 14001 does not guarantee improvement in performance.

Some MNCs claim they have much more sophisticated system in place other than the weak ISO 14001 as such there is no need to certify to ISO 14001 (Kolk, 2000). The system has also been criticized for not focusing on internal control. It has been said that it is deficient in giving guidelines on information needed for internal and external purposes, the organization of the information system, and how the system and its information should be verified. The criticism goes further that, certification itself does not give guarantee that, the management system meets all requirements. For example, it fails to specify limits to energy or resource consumption, emission levels and performance levels other than those of national levels, which in LDCs like Kenya are low and not complied with due to weak enforcement mechanisms. The system, it is said does not aim at protecting the environment (Welford, 1998). Certification therefore does not necessarily make a company environmentally perfect or constantly improving performance but rather depends on the people who drive it.

Another critic of the system is the high cost required to get certified. Not only the cost but the attendant bureaucracy involved in its preparation and implementation. The yearly auditing of records also adds to the cost. A number of man hours are therefore spent on the certificate. These problems deter small and medium scale enterprises in developing countries to get certification.

2.19 ISO 14001 and Environmental Management in Kenya

After its independence in 1963 from Great Britain, Kenya embarked on massive industrialization. There was heavy tariff protection of local industries. The economy ran into decline in the 70s with real income falling to 2%. There was economic mismanagement. The economy nearly collapsed in the 80s but was resuscitated with WB led policy of economic recovery program. Some measures taken included trade policy reforms, improvement in the tax system and reformation and divestiture of state enterprises. These measures led to an increase in the industrial performance of some industries but much improved in the local enterprises. New enterprises were formed and

a free zone area was created for industries, but due to cheap imports, a number of industries have collapsed e.g textile industry. Industries are still being attracted daily to the country. It is expected that the current environmental problems will increase.

Industrial environmental management has been very paramount in the agenda of the country making it expedient for a look at certification or use of EMS as an option to environmental management. The use of ISO 14001, a voluntary environmental management option is being offered as a way for environmental management in the country based on its ingrain properties of waste management, emission control, energy and water management, prevention of industrial disasters to mention just a few rather than end of pipe solutions currently being put in place. Kenya needs not follow the path of the industrialized countries of pollute first then develop later as put forward in the Environmental Kuznet's Curve (EKC).

The theory implies that during the initial stage of development, some form of environmental degradation occurs but increasing income produces incentives to improve environmental quality (Munasinghe, 1999). The aim is to encourage restructuring of development policy programs to move on the path of sustainability by flattening the EKC curve for the environmental indicators that are being dealt with. This process is aimed at avoiding the degree of environmental damage in Kenya as experienced by industrialized countries during their early periods of development without hindering development (Munasinghe, 1999).

2.20 The Kenyan environment

Kenya covers an area of 582,646 square kilometers including inland water bodies. The country lies at the equator on the east of the African continent. It enjoys a tropical climate being hot and humid at the coast, temperate inland and very dry in the north and north eastern parts .The population in 1997 was 31.3 million with a population density of 60 people per square kilometer. It has an urban population of 42% while 58% of the population lives in rural zones (GOK, 1997). The per capita income in 2007 was $360

dollars. The structure of Kenya's economy in 2007 showed that agriculture contributed 23.8%, services 59.5% and industry 16.7% to the GDP. Agriculture is the most important activity in terms of employment and the generation of foreign income. Economic activity is dependent on natural resource exploitation of land (cultivation), forestry and mining.

2.20.1 Historical overview of Environmental Management

Concern for the environment can be traced as far back as the pre-biblical periods. However, Pickering and Owen (1997) were the first to give concrete meaning to it at the United Nations Conference on the Human Environment held at Stockholm, Sweden in June 1972. The next summit was held in Brazil "Rio Conference" or the "Earth Summit" of 1992. Pickering and Owen further stressed that, the earth summit offered world leaders the rare opportunity of building consensus on managing the planet. A major outcome of the conference was the 27 point principle that was adopted by all the 171 countries. It was this awakening that gingered governments all over the world to take concrete steps towards the protection, management and enhancement of the environment (EPA, 1994). The government of Kenya established the National Environment Management Authority through the Environment Management Coordination Act of 1999 to manage its environment. The purpose of environmental management according to NEMA (2007) is to identify human activities that may threaten and affect the quality of the environment, implement mitigation measures at the appropriate time, to manage these effects, ensure that anticipated effects are maintained within the levels predicted, manage anticipated effects before they become a problem and, optimize environmental protection.

2.20.2 Environmental pressures experienced in Kenya

Environmental problems in Kenya include inadequate sanitary infrastructure, open defecation as a result of poverty, urban growth and development of unplanned

settlements, discharge of domestic and industrial wastewater into drains, inefficient drainage systems and poor management of sewage treatment infrastructure.

High rate of logging for the past three decades have remarkably increased the rate of deforestation and the vulnerability of freshwater resources to increasing evapotranspiration (NEMA, 2007). Poaching and trade in wildlife and wildlife products is the most important cause of habitat destruction and pushing species towards extinction. Shifting cultivation with short fallow periods and inappropriate use of tractors in ploughing has resulted in topsoil removal, erosion and loss of fertility.

The quest for better standards of living and increasing use of refrigerators, air-conditioning, aerosol sprays, insulation and furniture manufacture have contributed to high levels of Ozone Depleting Substances (ODS) in the past. Another environmental pressure in Kenya is pollution from vehicular exhaust emissions. Most vehicles that ply roads in the country are poorly maintained or are over-aged. This, coupled with heavy traffic in certain urban locations, contribute to poor urban air quality. The country has just phased-out lead from gasoline.Enormous amount of lead was released into the environment as a result of the use of leaded gasoline.

2.20.3 Industrialization in Kenya

Most Kenyan industries are import substitution industries in that, they seek to produce for domestic purposes goods which were formerly imported. Before independence, the country depended heavily on Britain for industrial needs while it concentrated on the production of primary raw materials like cotton, sisal, timber and dairy products. A lot of foreign exchange was used to import basic industrial goods. After independence in 1963, Kenya sought to industrialize. Important rationale for industrialization included conservation of foreign exchange and income to both workers and the government. Others included development and expansion of agriculture in form of agro-based industries. This in the long run stimulated other sectors through diversification of the economy so as to help reduce reliance on agricultural products whose prices kept on

fluctuating at the world market. The aim was to increase self-reliance, sufficiency and employment.

Some basic features of the industries include heavy reliance on both imported raw materials and financial institutions for their capital base. They also rely mainly on the local market, are labor intensive, and located close to the major towns of the country with dense population and high purchasing power.

The structure of industries in Kenya is based on three structures; Small, Medium and Large. Firms with less than 10 employees are small scale and they employ about 85% of the manufacturing labor force; those with more than 10 employees are medium scale and take up to about 10% of the labor force; and those with more than 50 employees are regarded as large enterprises and take about 5% of labor force (CBS, 2006). These basic features of industries in Kenya have led to some environmental problems in the country.

2.20.4 Industrial Environmental Management in Kenya

The present trend in industrial environmental management is towards prevention rather than the control of pollution. Options currently in place for sound industrial environmental management in Kenya include;

(i) Regulations for licensing of industries; this at present is being done by NEMA. This procedure offers a viable option for prevention of pollution. NEMA requires within the license the appropriate pollution control technology the industry being licensed needs to adopt. After establishment the industries discard the technology, some would promise to install but never do. This problem is compounded by lack of instruments and staff of NEMA to seek compliance to this mandate.

(ii) Citing of industries; the haphazard manner in which industries are sited in the country is being curtailed by the creation of industrial zones at designated areas of the country. The small scale ones are however not catered for in this development.

(iii) Environmental Impact Assessment (EIA) of industrial projects; this is a planning tool used to predict and evaluate impacts of proposed projects in order to assist decision-making (Ortolano and Shepherd, 1995). EIA comprises of a series of nine steps which include preliminary activities, impact identification, (scoping), baseline study, impact evaluation, mitigation measures, assessment (comparison of alternatives), documentation, decision–making and post auditing. The EIA process however has a problem of showing relationship between impact assessment and environmental management.It also over emphasizes treatment of impacts calling for its combination with other tools.

(iv) Use of pollution prevention technologies (PPT); this includes product reformulation, process modification, equipment redesign and recovery of waste materials for reuse. They are being done but on small, individual or company basis. Some of the equipment are however aged making the directive irrelevant.

The use of one or a combination of these approaches together with EMS will help industries reduce pollution through the conservation of raw materials, water, emissions, waste and energy use.

2.20.5 Kenya's Environmental Law enforcement

Most of the national legislation or environmental protection laws are not strictly enforced, and supporting agencies of government are weak. There is a general lack of political will and resources coupled with weak enforcement mechanisms. In some instances, there is the problem of inadequate staff, while in some; the staffs are poorly paid making them liable to external influence. Due to the inadequate pay, local staff members are bribed and violators of the laws go unpunished. At times, the punishments imposed are not severe enough to prevent repetition of pollution.For this reason, most industries find it cheaper to pollute rather than to prevent environmental degradation. Parliament recently gave NEMA a new enforcement responsibility. The authority is now

developing an environmental enforcement and compliance network with the participation of the police and other enforcement authorities.

2.20.6 Undertakings requiring registration and environmental permit

An environmental permit (EP) must be obtained in order to commence or implement any undertaking in Kenya.There are two conditions to be satisfied by a developer for an EP. They are:

- An application is submitted and "No Objection" is made.
- An (EIA) submitted on an undertaking.

The EP gives clearance only to commence the undertaking. It is granted on submission of annual environmental reports; submission of environmental management plans (EMP), obtaining an environmental certificate for the operational phase and provision of financial security in the form of insurance bond. The EP is valid for 18 months from date of issue. Where the undertaking does not start within 18 months, the developer is required to re-apply. An environmental certificate is issued within 24 months of start of operations, if the following conditions are met:

- Evidence of acquisition of other permits and approvals where applicable.
- Compliance with all the commitments stated in the EIA
- Compliance with all the conditions of the EP for the undertaking.
- Submission of an Annual Environmental Report and,
- Submission of an EMP

Environmental permit must be obtained for proposed new undertakings. The mandatory list for an EIA in Kenya includes transportation like roads, airports/airstrips, railways and harbors. For agriculture, it includes land greater than 40 hectares or affecting more than 20 families. Others include general construction and services like dams, land reclamation, dredging, industrial and housing estates. Mining of minerals or

exploitation, energy in the form of oil and gas fields/oil refineries, tourism, forestry and wildlife, and manufacturing industries like chemicals and petrol/chemicals, pulp and paper, food and beverages and textiles.

2.20.7 The National Environmental Action Plan (NEAP)

NEAP is Kenya's comprehensive environmental policy paper that contains six main working documents on mining, industry and hazardous chemicals, marine and coastal ecosystems, human settlements, forestry and wildlife, land management, and water management. The magnitude of ecological damage the country has experienced as a result of attempts to attract foreign direct investment triggered the need for an effective action to reduce their impacts, through the establishment of NEAP. NEAP defines a set of policy actions, related investments and institutional strengthening activities to make Kenya's strategy more environmentally sustainable (NEMA 2006). The policy proposes a provision of incentives and sanctions to ensure compliance with its provisions as well as harmonizing and enforcing relevant laws and treaties on the environment.

CHAPTER THREE

METHODOLOGY

3.1 Research approach

Methodology is a definitive way or process of investigating an issue.Cooper and Schindler, (2016) states that, a research methodology defines how one will study any phenomenon.This entails the design and procedures used by the investigator to gather information for hypothesis testing.Kothari, (2004) classify research approaches into experimental, survey, qualitative, content analysis and longitudinal research. This study adopted the quantitative research method.

Figure 2 below outlines the entire process from field work, data processing and report writing to report presentation.

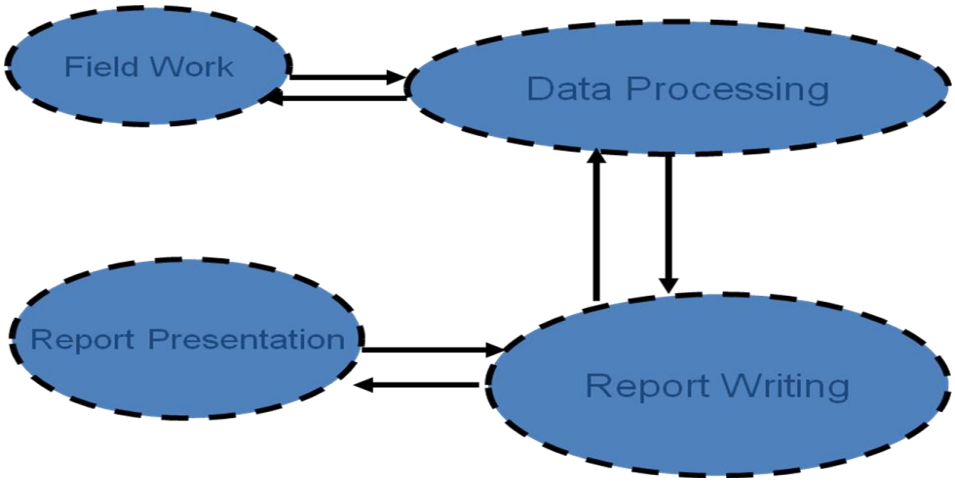

Figure 2.2: Research methodology

3.2 Study site

The study was based in all the major industrial towns of Kenya. These included Nairobi, Mombasa, Kisumu, Nakuru, Naivasha, Kericho, Eldoret, Kitale, Thika and Machakos.

3.3 Sample frame

The most recent list of all registered companies in Kenya was obtained from the Central Bureau of Statistics. A list of the ISO 14001 certified companies was also obtained from Kenya Bureau of Standards, Bureau Veritas and Societe Generale. This list was used to determine the number of certified companies in Kenya. Stratified random sampling was employed whereby three strata were chosen namely; agricultural, manufacturing and service industries.The target population was 43 respondents.

A representative sample size with known confidence and risk levels was selected, based on the work of Yamane (1967) formula. An appropriate response rate (sample size) was determined. Yamane (1967) formula is illustrated below;

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n= Sample size

N=Target population (43)

e= Proportion of the study (0.10)

$$n = \frac{43}{1 + 43(0.1)^2}$$

$$n = \frac{43}{1 + 43(0.01)}$$

43/1.43

=30 respondents

According to Mugenda and Mugenda, (2003) a sample size of between 10-30% of the target population is large enough so long as it allows for reliable data analysis and allows testing for significance of differences between estimates.

A 95% confidence level is deemed acceptable and thus statistically z = 2. Placing information in the above formula at a 95% confidence level and an error limit of 10% results in 30 respondents

Appointments were then secured using telephone calls before the actual visit. A structured questionnaire was administered through face to face interviews to some of the managers of the departments responsible to the environment in the companies. Results from thirty (30) organizations were used for the study. Environmental managers were chosen since they were in charge of the environment and were knowledgeable about the EMS process. Where the company did not have such a position, the questionnaire was administered to the general manager, the Chief Executive Officer or the production manager.

3.4 Evaluation of current status of EMS adoption by Kenyan industries.

In evaluation of the current status of EM adoption in Kenyan industries respondents were asked to identify the environmental management system that had been established in their organization.This included ISO 9000/9002 on quality management, Safety and Management system, ISO 14001 on environment management, Eco-labeling, Waste Management System, Energy conservation, and Life cycle assessment. They were also to state whether these systems had been certified and when this was done.

3.5 Determination of key factors that influence adoption of EM practices in Kenya.

Key factors that influenced the adoption of EM practices in Kenya included both the drivers and challenges faced in the process of implementation.

In determining the drivers, respondents were asked to state the most important rationale for its implementation which included international acceptance of goods, prevention of pollution, facilitation of compliance to regulations, pressure from customers and reduction of costs

In determining the impediments to EMS implementation, respondents were to indicate the main challenges they faced in the process which included the high investment required, management ignorance of its existence, the long time required for certification, the lack of government incentives and its voluntary nature

3.6 Evaluation of extent of compliance to local environmental regulations by industries in Kenya.

This was achieved by respondents being asked to indicate their level of compliance in percentage form from twenty to a hundred percent.

3.7 Data collection

Primary data from the sites were collected. These were obtained using the structured questionnaire at appendix 1. Responses were recorded on a field notebook during interviews. Observations and other information obtained from personal and informal communication during the fieldwork were recorded on the fieldwork notebook.

Secondary data such as internet reports, publications from National Environmental Management Authority, Environmental Impact Assessment and Environmental Audit reports, conference proceedings, government documents, published electronic and print

journals and information from important people on environment in Kenya among others were used.

3.8 Data processing

Data in their raw form do not speak for themselves and thus the need for data processing and analysis (Cooper & Schindler, 2016).

The process involved; Identifying (and correcting) errors in the data, coding the data, storing it in appropriate format, actual data analysis and report writing

All questionnaires were given serial numbers /IDs in order to; keep record of the questionnaires, use the serial numbers in data cleaning, to do away with incorrectly answered questionnaires and to do away with incomplete questionnaires

Data coding for the closed ended questions was done. Data coding is the process of assigning a numeric value to an item in a questionnaire that may or may not have predetermined numerical value. It is the process of translating answers into numbered categories for purpose of tabulation and analysis. ISO 14001 certified organizations were assigned code 1 whereas those uncertified were assigned code 2.

Epi-data (database design software) was used to perform data entry. Data cleaning was undertaken after entry in order to provide quality data free of errors while ensuring logical data flow

After data entry, the data was exported to SPSS (Statistical Package for Social Sciences) for analysis.

3.9 Report presentation

The data were presented by means of percentages, frequency distributions, bar graphs, tables and pie-charts. Charts were done using SPSS and PowerPoint.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter discusses results obtained from the study based on the set objectives. The survey was primarily based on three main sectors within Kenya's ISO 14001 certified and uncertified organizations. These were the agricultural, manufacturing and service sectors. Out of the thirty (30) organizations sampled, ten (10) were from the manufacturing sector, and ten (10) from the agricultural sector, while ten (10) were from the service sector.

4.2 Current status of EMS adoption by Kenyan industries

The results of the current status of EM adoption by Kenyan industries are presented in figure 3 (and in appendix 2).It shows that 31% of the companies (or 8 out 30) had waste management systems in place, while 20% of them had been certified to ISO 14001 EMS.Only 13.3% practiced energy conservation while eco-labeling, life cycle assessment and others took 8.9%, 4.4%, and 2.2% respectively.

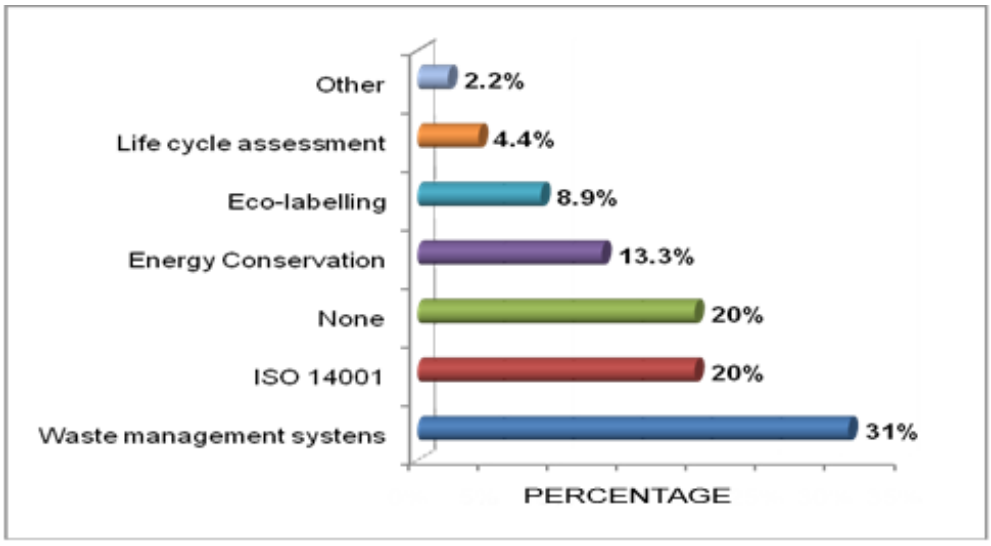

Figure 4.1: Current status of EMS adoption by Kenyan industries

The findings concur with those of Miles et al, (1997) who argues that the adoption of an environmental management system in Kenyan industries is low and that it can be an appropriate initial step for those companies wishing to move towards more environmentally aware positions.The development and adoption of an environmental management system can be simplified and systematized if the company chooses to comply with any widely accepted standard.

4.2.1 Waste management

Waste management was identified as a form of EM practice in the country. Few companies were found to have had effective and functioning effluent treatment plants.The municipal authorities were facing a lot of problems managing waste as effective waste management systems were not in operation.

4.2.2 ISO 14001

20% (6) companies were found to be certified to ISO 14001 standard.These were mainly multinationals with their parent organizations in Europe and were exporting their

products to the European market.

4.2.3 Energy conservation

This form of EM practice can be attributed to the energy crisis that the country was facing as a result of the perennial low level of water in the Seven Folks dams due to low rainfall in the country in 2008. KenGen had to ration power to companies, forcing majority of them to resort to use of fossil fueled power generators with its attendant environmental problems. The government also increased electricity tariff by 100%. Companies were therefore compelled to curtail their energy use to save cost.

4.2.4 Eco labeling

Eco labeling is practiced by about 9% of Kenyan industries. A majority of these were exporting their goods to western countries and this is the reason why they provided their products with a label indicating its environmental friendliness.

4.2.5 Life cycle assessment

LCA was also identified as a form of EM practice (about 4.4%) but this was on the low side when compared to practices in other countries like Nigeria, Cote d'Ivoir and Zimbabwe.The most important products that were recycled were paper and scrap metal, where the latter was recycled into iron rod. These findings confirm the proposition that there was no organized structure to promote EMS in Kenya.This has resulted in a self-initiative by industries and organizations to put into effect their own EMS. All they do is an agglomeration of practices to help them maximize cost, but not on improving the environment, thereby leading to the numerous environmental problems in the country.

The study indicated that industries used different management systems other than environment management systems.The major management system in operation was the safety and management, (with 50% respondents) followed by ISO 9000/9002 which took about 29% of the responses whilst 18.4% of the industries surveyed did not have

any form of management system in place The rest of the results have been summarided in the figure 4 and (and in appendix 3).The findings concur with those of Yiridoe et al, (2003) who argues that the adoption of life cycle assessment is at lower rate in the developing Countries.The study laments that life cycle assessment reduce the resource requirements and create more economic value by reducing, reusing and recycling of materials and energy while minimising the costs and the amount of waste created.

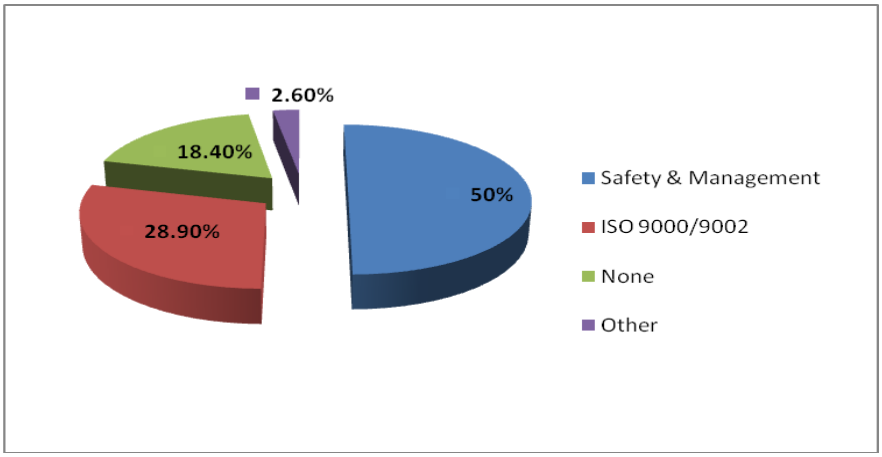

Figure 4.2: Other management systems in operation other than EM

4.2.6 Safety and management

This was attributed to the 'gateway project' the government was propagating for export to the EU. About 40% of these companies were exporters to developed countries of Europe and America.

When contrasted with developments in other African countries like Egypt, Zimbabwe and Nigeria, these percentages show that Kenya is far lagging behind in the development of EM systems (Mohamed, 2001). However with the setting up of SGS, Bureau Veritas and CVS international in the country, the situation is likely to change.

4.2.7 ISO 9000/9002

The survey shows that about a third of Kenyan industries had adopted ISO 9000/9002 quality management system.These industries do not have standardized EMS's, whilst about 20% of the companies do not have any form of EM practice in their operations (Figure 4).

4.3 Determination of key factors that influence adoption of EM practices by industries in Kenya.

Key factors that influence adoption of EM practices by industries in Kenya include both the drivers that motivate organizations to adopt EM practices and the challenges that organizations face in the process of implementing the EM practices

4.3.1 Drivers for the implementation of EM practices

Figure 5 and (and in appendix 4) presents the factors that drive industries in implementation of EM practices.It shows that pollution prevention was the major driver for the implementation of EM taking 27.5% of the respondents, followed by cost reduction, 23.2.%, facilitation of compliance to local environmental regulations, 18.8%, international acceptance, 14.5%, while pressure from customers took 8.7% .Those who could not tell were 5.8% while 1.5% of the respondents were motivated by other factors.The study findings add to the findings of the study by (ISO 1996) who states that globalization coupled with industrialization with increasing environmental degradation has compelled a number of firms and organizations to adopt new strategies for sustainability.Drivers of EMS in industries and organizations are grouped into two but with five different factors. They include; the organizations themselves, market, social including the public and community, financial organizations and regulatory authorities (ISO 1996).

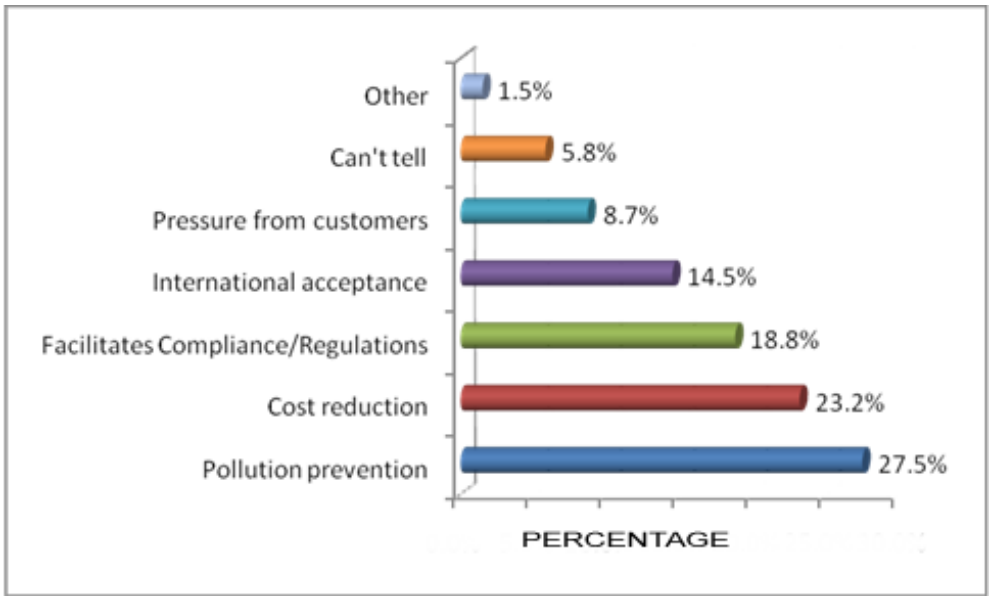

Figure 4.3: Drivers for the implementation of EM practices

(I) Pollution prevention

27.5% of the industries implemented EMS to prevent or minimize pollution to the environment resulting from their operations. This was attributed to the low level of awareness by management to the effects of pollution to environment which affects their employees' livelihoods, company's operations and costs in the long run.

(ii) Cost reduction

Cost reduction took 23.2%.This is usually a well-known rationale for implementing EMS all over the world (Kuhre, 1995). However it was not a major reason for the setting up of ISO 14001 by Kenyan industries.

(iii) Facilitation of compliance

Implementation of EMS facilitates compliance to local environmental regulations (Kuhre, 1995). However, only 18.8% of the industries had implemented their EMS due to this reason.

(iv) International acceptance

It was observed on figure 5 that 14.5% of the organizations that currently practice EM were derived from their parent organizations. These parent organizations were outside the country. Market opportunities especially in EU compelled some of the industries to embark on EM. These responses were from industries that export substantial amounts of their products to industries in the EU, for example the flower industries. The EU was the major exporting market to Kenyan export processing firms. Since this market was very sensitive to environmental issues (Wall et al., 2001) they had no alternative but to use the system. However, these industries were few compared to industries that produce for local consumption

(v) Pressure from customers

Pressure from customers is the lowest driver for the setting up of EM within Kenyan industries. Low environmental awareness by consumers in the country, in this case the general public leads to companies not having a real driver for setting up an EMS and therefore end up abusing the environment unabated. For example, companies close to the ocean at times empty untreated waste water into the ocean. They find it easier to do this as treatment of waste increases cost thus reducing profits. Enforcement and monitoring was very poor in the country giving leverage to the industries to indulge in these environment degrading acts.

4.3.2 Main challenges to Implementation of ISO 14001 EMS

Figure 6 and table 4.4 presents' results of main challenges of implementing an EMS in Kenya. The major challenge in setting up of EMS was high investment required, as given by 40.3% of the respondents. This was closely followed by lack of government incentives at 35.8%, delay in certification, 10.4% lack of awareness by management ignorance of its existence, 9% while its voluntary nature took 1.5% of the respondents.The study findings add to the observation of (Herbert, (2004) who pointed out that businesses derive benefits from implementing an EMS because it provides a holistic framework for identifying, quantifying and facilitating positive action to achieve environmental improvements and tangible business benefits.These benefits are business and context specific and may be direct, (e.g. cost savings); indirect, (e.g. avoided liabilities) or strategic, (e.g. new business possibilities) (Kolk, 2000).

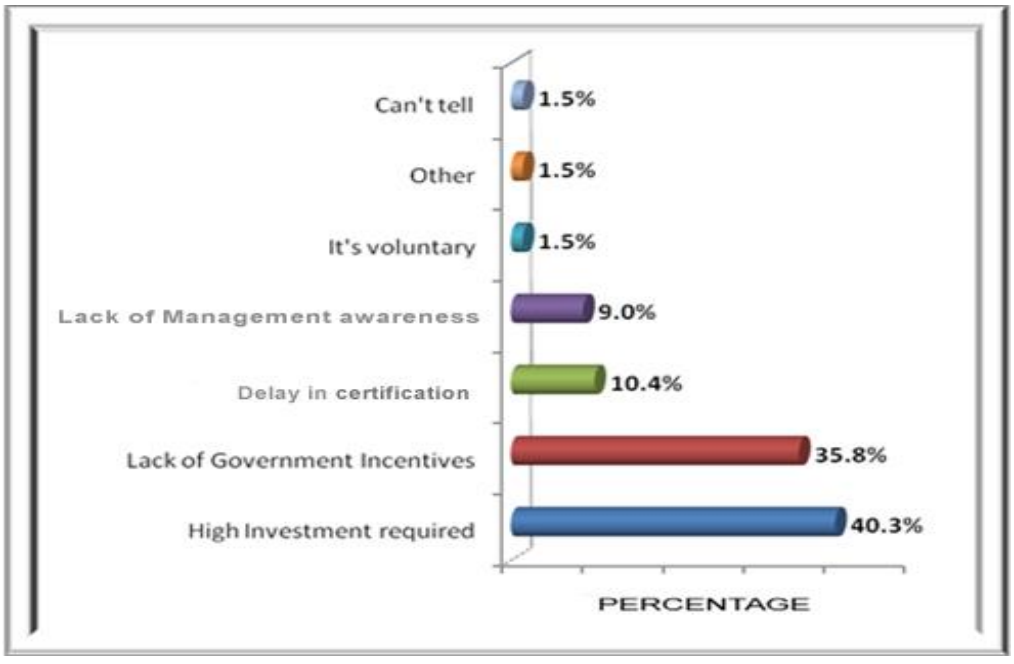

Figure 4.4: Main challenges to Implementation of ISO 14001 EMS

(i) High investment required

40.3% of the companies cited high initial cost of acquiring the certificate as a hindrance to setting up ISO 14001 EMS.Given the costs of registration, combined with the costs of consultancy expertise and auditing which Kenyan firms were lacking, small and domestic operations like Kenyan industries would not be able to certify their EMS without outside financial assistance. Turner et al (2000) showed that larger firms were likely to spread cost of certification to ISO 14001 and other standards, thus they were able to benefit from certification. There is a strong relationship between size of firms and certification to ISO 14001 and other international standards (Davy 1997).If Kenyan firms are small in size and are import substitution type,, then they were better off not certifying to international standards.They are now under competition from trade liberalization and as such have to be competitive.

The cost of certifying EMS was high and beyond the scope of Kenyan industries manufacturing mainly for the domestic market. Capital cost is a major barrier to certification.Firms spent around $10,000 to $50,000 to get the certificate depending on their size (Post and Altman, 2003). In Kenya certified firms spent around Ksh.420, 000 in getting the certificate. This was beyond the means of Kenyan firms which were import substitution industries.

(ii) Lack of government incentive

Lack of government incentive followed closely with 35.8% of the responses. In a number of advanced and developing countries, government institutions have helped to put EMS functioning. They've laid important infrastructure for industry. This infrastructure led to increased improvement in environmental performance especially with energy use, water management, pollution and technology use (MAC, 1998). Developed countries that had got their industries certified to ISO 14001 developed structures and gave incentives to the industries to develop EMS. In Europe, America, and Asia, regulatory agencies, including businesses have actively pushed the

development of ISO 14001 (Yiridoe et al, 2003). Some Asian countries have government funded ISO 14001 support programs in place and some are hoping that an ISO 14001 system will assist them in monitoring industry (OECD, 1998). In addition to regulatory agencies, local government administrations were also taking a number of measures to promote the use of ISO 14001 (Yano, 1998).

(iii) Delay in certification

Delay in certification followed with 10.4%. Some companies spent a long time getting help in the certification process. Many hours were spent which could have been used in other productive ventures.

(iv) Lack of management awareness

9% of respondents claimed that senior management was unaware of the existence of EMS. They were not taking environment issues seriously and this could be attributed to the voluntary nature of the system whereby management is not mandated by any legality to implement.

(v) It's voluntary nature

ISO 14001 is a voluntary initiative hence it is not obligatory on firms to be certified. The Kenyan case was not different, leading to low certification

Others include long procedures involved, lack of certifiers, cost of maintaining certificate and inadequate personnel. Some of the companies did not have personnel responsible to the environment, and depended on other staffs who were not environmentalists to undertake environmental issues. Environmental managers were in a better position to use the procedures involved in EMS.

4.3.3 Evaluation of extent of Compliance to Legislation

EM in Kenya was until now characterized by a command and control (CAC) approach. The use of this instrument according to Hens and Boon (1998) has the problem of limited capital for establishing relevant institutions, low managerial and administrative skills and inadequate enforcement capacities.Economic instruments as well have the capacity of helping to reduce environmental degradation; however, the level of compliance was a problem.

Figure 7 and table 4.5 indicates that, 33% of the respondents pointed out that their level of compliance to environmental regulations was 40% and another 27% complied with environmental regulations at a level of 60% and 80% whilst 13% complied at a level of 20%.The study findings add to the observation of Nee and Wahid (2010) who pointed out that the global implementation of environmental management systems is associated with a more active environmental strategy and the level of compliance to environmental regulations.

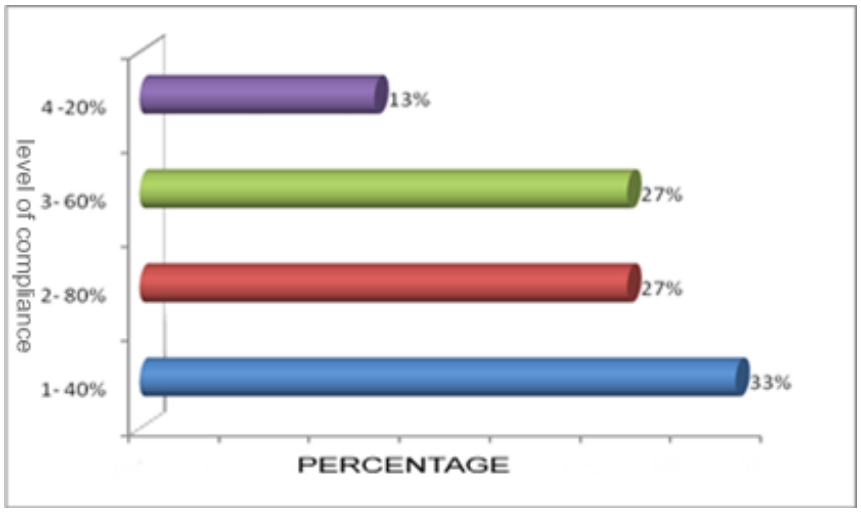

Fig. 4.5: Level of Compliance to Environmental Legislation

About 80% of the companies easily identified some impacts of their activities on the environment in the form of discharge to water, emissions to air, and waste products. The type of technology at disposal when compared to that of the industrialized countries in Europe and America was a major challenge to adoption of good EM. Discarded technology from industrialized countries was being used in Kenya.

Only 10% of the industries had a functioning waste treatment facility. Efficient regulatory system would push industry to divert second hand equipment which industrialized countries could not use as a result of age and development of new technologies and resources to more productive and sustainable environmental techniques.

Kenya seeks to attract industries from developed countries to provide employment, income and revenue for economic development. At the same time, these industries seek to increase profits by minimizing costs.EMS increases costs to their operations and they do not have means of adopting the right technology and therefore they pollute the environment (Krut and Gleckman, 1998).This problem makes it difficult for government agencies to penalize industries polluting the environment in the country. A tighter

legislation will repel industrialists from investing in the country. Legislation is an incentive for improving environmental performance. It ensures industries use the best available technology and environmental option and therefore the best EMS necessary for development. This systems-based approach serves as a tool for increased certification, with spin-off in exports for revenue, local development and poverty reduction

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the major findings from the study results and the conclusions made from the results.It also presents the recommendations by the researcher on the factors that influence implementation and compliance of ISO 14001 based Environmental Management Systems by industries in Kenya.The objectives of the study were to evaluate current status of EMS adoption by Kenyan industries, determine key factors that influence adoption of EM practices and evaluate extent of compliance to local environmental regulations.

5.2 Summary

5.2.1 Current status of EMS adoption

The study established that 31% of the companies had waste management systems in place, while 20% of them had been certified to ISO 14001 EMS. Only 13.3% practiced energy conservation while eco-labeling, life cycle assessment and others took 8.9%, 4.4%, and 2.2% respectively. NEMA has established a desk for EMS but has not made it a priority as compared to EIA and EA. The Kenya Association of Manufacturers was promoting energy conservation. There was little incentive for industries to take their own initiative to establish structured EMS.

5.2.2 Key factors that influence adoption of EM practices

The study established that pollution prevention was the major driver for the implementation of EM taking 27.5% of the respondents, followed by cost reduction, 23.2.%, facilitation of compliance to local environmental regulations, 18.8%, international acceptance, 14.5%, while pressure from customers took 8.7%.

The study established that the major challenge in setting up of EMS was high investment required, as given by 40.3% of the respondents. This was closely followed by lack of government incentives at 35.8%, delay in certification, 10.4% lack of awareness by management ignorance of its existence, 9% while its voluntary nature took 1.5% of the respondents.

5.2.3 Extent of compliance to local environmental regulations

The study established that 33% of the respondents pointed out that their level of compliance to environmental regulations was 40% and another 27% complied with environmental regulations at a level of 60% and 80% whilst 13% complied at a level of 20%.EMS through ISO 14001 certification will serve as a viable option for environmental protection and sustainable development in Kenya. The goal therefore should be how environment aspects are managed, how companies set targets and achieve most of their performance objectives.

5.3 Conclusions

The study concluded the following

i. That a majority of companies in Kenya have developed some forms of EM practices like energy conservation, waste management, LCA, eco – labeling, and recycling which are all inherent within standardized EMS. Other management practices included; safety and management and ISO 9000/9002 quality management system. Waste management was the major form of EM practice.
ii. That the key factors that influence adoption of EM practices by industries in Kenya includes both the drivers that motivate organizations to adopt EM practices and the challenges that organizations face in the process of implementing the EM practices.
iii. Tha the main challenge to EM implementation by Kenyan industries was the initial high investment required. Certified companies spent between US $20,000

and US $40,000 US dollars to certify. Others include; lack of government incentives, delay in certification, management ignorance of its benefits and its voluntary nature

iv. That the extent of compliance to local legislation was low considering that a majority of the companies had 40% compliance and a few of them (13%) complied fully. The low level of environmental regulation and enforcement mechanisms gave industries little incentives for environmental protection. Good regulatory systems make industries invest in productive and sustainable environmental techniques.

5.4.4 Recommendations

i. To enhance good environmental quality, enforcement of applicable legislation should be combined with education on voluntary EMS. Good environmental policies, collaboration and communication between stakeholders in the environmental field should be fostered as this is a challenge to the involvement and mutual trust among stakeholders. This could be done through stakeholder forums, workshops and seminars. With this, both the companies and other stakeholders become aware of the need and benefits of its implementation. Generally, level of environmental education and awareness is low in developing countries; therefore there is need for general environmental enlightenment and education.

ii. Increased certification services by accredited entities would create competition and reduce the cost of certification. There is also need for qualified and certified environmental auditors as well as strengthen legislations on environmental performance and compliance

iii. More partnerships should be established between developed and developing countries to facilitate knowledge transfer and to equalize the resource burden of adopting standardization. Some mechanisms for putting into effect this recommendation include multi-lateral funding and company-to-company

partnerships.

iv. Some industries are putting into place ISO 9001/2. Industries implementing ISO 9001/2 QMS should be made to include the ISO 14001 at once to curb the high cost of implementing both systems individually. More time will however be spent on the certification but money saved would be higher.

v. Standardized EMS results in improved environmental performance, leading to decreased environmental impacts. The reliance on EIA and EA to influence environmental management is recommended, however, this is not adequate in solving environmental problems in the country. It is essential for NEMA to ensure all industries establish waste treatment facilities to prevent or minimize pollution. EMS should be within the Kenyan environmental law. The sustainable use of resources could be encouraged through awareness creation programs as well as the enforcement of existing legislation.

vi. Increase incentives to certified companies. These incentives could be in form of tax concessions and awards. This would encourage those implementing the system and motivate others. Also small firms need to be encouraged to set up the systems at their own scale.

vii. Governments must ensure that their corporations set good examples for others to follow by taking the issue of environmental performance and compliance seriously in its own corporations. If this was the case, then other corporations would not have reason or excuse from compliance.

5.5 Suggestions for future research

i. EMS is a new area of strategies for EM in LDCs and more research is needed in sectors that have significant impacts on the environment and rural livelihoods like the mining sector.

ii. EM within the SMEs is also needed.

iii. It is essential to examine how auditors perceive EMS within SMEs in LDCs.

iv. It is important to seek regulatory shifts that occur as a result of the effectiveness

of EMS in terms of real and continuous environmental improvement as stipulated in the ISO 14001 standard and show how these have impacted the company's relation with regulators.

.

REFERENCES

Aboulnag, I. (1998): Integrating Quality and Environmental Management as Competitive Business Strategy for the 21st Century, *Environmental Management and Health*, 9, 2,65-71.

Banergee, S. B. (1998): Corporate Environmentalism. Perspectives from Organizational Learning in Zutshi, A and Sohal, A., *(2002): Environmental Management System Adoption by Australian Organizations: Part 1: Reasons, Benefits and Impediments*. Working Paper 44/02, Department of Management, Monash University, Australia.

Barney, J. (1991): Firm Resources and Sustained Competitive Advantage. *Journal of Management* 17 (1): 99–120.

Berkhout, F. and Hertin, J. (2001): Towards Environmental Performance Management. SPRU- Science and Technology Policy Research, University of Sussex, U.K

Brorson, T. and Larsson, G. (1999): *Environmental Management:* How to Implement an Environmental Management System within a Company or Other Organization, EMS AB, Stockholm.

Cascio, J., Woodside, G., and Mitchell, P. (1996): *ISO 14000 Guide: The New International Environmental Management Standards*. McGraw Hill, U.S.A.

Chan, R., H. (1998): ISO 14000: Change for the Better, Proceedings of the Third

International Conference, April 14-16 in Zutshi, A and Sohal, A., *(2002): Environmental Management System Adoption by Australian Organizations: Part 1: Reasons, Benefits and Impediments*. Working Paper 44/02, Department of Management, Monash University, Australia.

Clements, R. B. (1996): *Complete Guide to ISO 14000*. Upper Saddle River, New Jersey: Prentice Hall.

Cooper, D. R., & Schindler, P.S. (2016) *Business Research Method*, (9th ed.), Boston: McGraw-Hill Irwin.

Davy, A. (1997): EMS: ISO 14001 Issues for developing countries In *ISO 14001 and Beyond*, Sheldon C (ed.) Greenleaf: Sheffield.

EPA (1999) Proposed National Environmental Quality Standards and Monitoring

Requirements for Industrial Effluents, Air and Noise Level Regulations, Environmental Protection Agency. *Environmental Policy*. Human Ecology, Universiteit Brussel, Belgium.

Fei Shi. (2015). *Study on a Stratified Sampling Investigation Method for Resident Travel and the Sampling Rate.* Hindawi: Hindawi Publishing Corporation Discrete Dynamics in Nature and Society

Hewitt, G. and Gary, R. (1998): ISO 14001 EMS Implementation Handbook, Butterworth-Heinemann Ltd, Oxford, U.K.

ISO (1996): ISO 14001 EMS- Specification with Guidance for Use International Organizationfor Standardization, Geneva.

ISO (2003): *ISO Survey*: International Standards Organization, Ref.: 864

ISO World (2004). The Number of ISO 14001 Certification of the World". http://www.ecology.or.jp/isoworld/english/analy14k.htm,

Jackson, D. L., Voth, J., & Frey, M. P. (2013). A note on sample size and solution propriety for confirmatory factor analytic models. *Structural Equation Modeling: A Multidisciplinary Journal*, *20*(1), 86-97.

Jaffe, A. B., Peterson, S. R., Portney, P. R., and Robert, N. S. (1995): Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us? *Journal of Economic Literature 30*, 132-63.

Khanna, M., and. Anton, W. R. Q., (2002): What is Driving Corporate Environmentalism: Opportunity or Threat? *Corporate Environmental Strategy,* Vol. 9, No. 4

Kirkland, L. H., and Thompson, D. (1999): Challenges in Designing, Implementing and Operating an Environmental Management System, *Business Strategy and the Environment*, Vol. 8, 128–143.

Kolk, A. (2000): *Economics of Environmental Management*, Pearson Education Limited, Prentice Hall, England

Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

Kuhre W. L. (1995): *ISO 14001 Certification—Environmental Management Systems*, Prentice Hall.

Krut, R., and Gleckman, H., (1998): *ISO 14001. A Missed Opportunity for Sustainable Global Industrial Development*, Earthscan, U.K.

MAC (1998): *Environmental Progress Report*. Mining Association of Canada (MAC), Ottawa.

Madsen, H. and Ulhoi, J. P. (1999): Industry and the Environment: A Danish Perspective. *industry and Environment January–March*, 35–37.

Mbohwa, C and Fukada, S. (2002): ISO 14001 Certification in Zimbabwe: Experiences, Problems and Prospects, *Corporate Environmental Strategy*, *9*(4), 427- 436.

Mihyo, P. S. (2003): European Union Environmental Regulations and their Potential Impact on Market Access for Africa's Export", In Olowu and Sako (Eds) *Better Governance and Public Policy Capacity Building for Democracy*. African Capacity Building Foundation, Kumarian Press, Inc, United States.

Morrison, J., Cushing, K. K., Day, Z., and Speir, J. (2000): Managing a Better Environment: Opportunities and Obstacles for ISO 14001 in *Public Policy and Commerce,* Pacific Institute, Occasional Paper, US.

Moxen, John., and Strachan, P. A. (2000): ISO 14001: A Case of Cultural Myopia. *Eco-Management and Auditing*. 7, 82–90.

Mugenda, O. M., & Mugenda, A. G. (2003). Research methods. *Quantitative and qualitative approaches*, 46-48.

Munasinghe, M (1999): *I*s Environmental Degradation an Inevitable Consequence of Economic Growth? Tunneling through the Environmental Kuznet's Curve. *Ecological Economics* 29(1), 89-109.

Nii Consult (1998): Water Resources Management Studies. *Information Building Block* Part 3.

Noci, G., and Verganti, R., (1999): Managing "Green" Product Innovation in Small Firms, *Research and Development Management*, *29*(1), 3–15.

OECD (1998): What do Standards for EMS offer? Background Paper: Review of the Development of International EMS-ISO 14000 Standard Series-Organization for Economic Co-operation and Development, Paris.

Ortolano, L., and Shepherd, A. (1995): Environmental Impact Assessment. In: *Environmental and Social Impact Assessment*, (eds) Vanclay, F and Bronstein, D.A., pp. 3-30. J Wiley & Sons Ltd, London.

Patton, D. and Baron, P. J. (1995): Factors Influencing Companies Response to Environmental Responsibility. *Eco- Management and Auditing 2*, 41–46.

Pickering, K. T., and Owen, L. A. (1997): *An Introduction to Global Environmental Issues*, Routledge, U.K

Porter, M. and Claas, L. (1995b): Toward a New Conception of the Environment Competitiveness Relationship. *J. Econ. Perspectives* 9(4), 97-118.

Post, J. E. and Altman, B. W. (1994): Managing The Environmental Change Process: Barriers and Opportunities, *Journal of Organizational Change Management*, *7*(4), 64-81

Prakash, A. (1999): A New-Institutionalist Perspective on ISO 14000 and Responsible Care. *Business Strategy and the Environment 8*, 322–335.

Raines, S. S. (2002): Implementing ISO 14001-An International Survey Assessing the Benefits of Certification. *Corporate Environmental Strategy*, *9*(4)

Roy, M., and Vezina, R. (2001): Environmental Performance as a Basis for Competitive Strategy: Opportunities and threats", *Corporate Environmental Strategy, 8*(4}, 339-347.

Sayre, D. (1996): *Inside ISO 14000. The Competitive Advantage of Environmental Management*. St Lucie Press, U.S.A.

Sheldon, C. (1997) *ISO 14001 and Beyond: EMS in the Real World* - Green Leaf Publications, New York.

Simpson, M., Taylor, N., and Barker, K. (2004): Environmental Responsibility in Small and Medium Enterprises: Does it Deliver Competitive Advantage? *Business Strategy and the Environment 13*, 156–171.

Soeftestad, L. (1996) May 1996 Stakeholder Workshop Process-Process Documentation. World Bank: Washington.

Spruill, N., Kenny, C. and Kaplan, L. (2001): Community Development and Systems Thinking: Theory and Practice. *National Civic Review*, *90,* 105-117.

Söderbom, M. and Teal, F. (2004): Size and Efficiency in African Manufacturing Firms: Evidence from firm-level Panel Data. *Journal of Development Economics 73*, 369–394

Stafford, H. A. (1985): Environmental Protection and Industrial Location", *Annals of American Geographers 75*(2), 227-240.

Stapleton, P., Glover, M., and Davis, S. (2001): *Environmental Management Systems: An Implementation Guide for Small and Medium Sized Organizations,* (2nd ed). NSF International: U.S.A

Turner, C. R. Ortmann, G. F. and Lyne, M. C. (2000): Adoption of ISO 9000 Quality Assurance Standards by South African Agribusiness Firms. *Agribusiness, 16*(3), 295–307.

APPENDICES

Appendix I: A Questionnaire for Organizations

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

INSTITUTE FOR ENERGY AND ENVIRONMENTAL TECHNOLOGY

P.O. BOX 62000, 00200NAIROBI, KENYA. Tel: (067) 52251/52711/52181-4, Fax: (067) 52164 Thika, Email: director@ieet.jkuat.ac.ke

A QUESTIONNAIRE FOR ORGANIZATIONS

Good morning/afternoon. My name is ……from the Jomo Kenyatta University of Agriculture and Technology. I am conducting a study to investigate the implementation and compliance of environmental management systems by companies in Kenya. The information you will give will be treated as confidential and will not be used otherwise. It is for the purpose of research and documentation in general. Your co-operation will be highly appreciated.

A. BACKGROUND INFORMATION

1. Name of organization…….

2. Name of respondent…… (Optional)

3. Position of respondent…….

4. Education level of respondent

O level [ ] A level [ ] Diploma [ ] Higher Diploma [ ]

Degree [ ] Masters [ ] Doctorate [ ] Other (specify) ……

B. EMS IMPLEMENTATION

5. Which management system have you established in your organization?

a. ISO 9000/9002 [ ] b. Safety and Management []

c. None [] d. Others..... []

6. Which EMS have you developed in your establishment?

a. ISO 14001 [ ] b. Eco-labeling []

c. Waste Management System [ ] d. Energy conservation []

e. Life cycle assessment [LCA] [ ] f. Other.....

g. None []

7. Have these system(s) been certified? a. Yes [ ] b. No [ ]

c. Can't Tell []

8. What is the most important rationale for its implementation?

a. International acceptance [] b. Pollution prevention []

c. Facilitates compliance/regulations [ ] d. Pressure from customers []

e. Cost Reduction [] f. Parent organization []

g. Other..... []

9. Who is responsible for the EMS implementation in the establishment?

a. CEO [] b. Quality manager []

c. Environmental manager [] d. Production manager []

e. Board of directors [] f. Other.....[ ]

10. What is the major driver of the implementation of the EMS in your establishment?

a. Board of directors [] b. Employees []

c. Government regulation [] d. Customers []

e. Consultants [] f. Other..... [ ]

g. Can't tell []

C. ADVANTAGES

11. How would you rate the success of the standard?

a. Failed [] b. Succeeded [ ] c. Can't Tell []

12. What are the reasons for failure of the EMS in your company?

a. Lack of experience [] b. Lack of personnel [ ]

c. High cost of certification [] d. Lack of planning [ ]

e. Inadequate management involvement [ ] f. Can't tell [ ]

g. Others.....

13. What are the reasons for success of the EMS in your company?

a. Experience with other management systems [ ]

b. Management commitment and involvement [ ]

c. Training workers acquired []

d. Can't tell [] e. Others ..... [ ]

14. How has EMS impacted your company's overall performance in terms of creating comparative advantage?

a. Decreased [] b. Slightly decreased []

c. No change [] d. Slightly increased []

e. Increased [] f. Can't tell []

15. If it has decreased, what are the causes?

a. Government legislation [ ] b. Inadequate management awareness []

c. Low market access [ ] d. Inadequate customer awreness []

e. Can't Tell [ ] f. Other…… []

16. If it has increased, what has brought this increment?

a. Penetration of other markets [ ] b. Increased market share []

c. Cost reduction [] d. Waste reduction []

e. Reduction of fines and legal fees [] f. Can't tell []

g. Other..... ..... []

17. Has the competence in your company staff in EMS increased since implementation?

a. Yes [] b. No []

18. Has the attitude of the staff towards environmental work changed during the process?

a. Yes [] b. No []

19. Did you effect changes in the products after implementation?

a. Yes [] b. No []

20. Would you say ISO 14001 is a ticket/guarantee to market access to industrialized

countries.

a. Yes [] b. No [ ] c. Can't tell []

D. BARRIERS

21. What kind of impediments/barriers have you met in your process of EMS implementation?

a. High investment required [] b. Management ignorance of its existence []

c. Long time of certification [] d. Lack of government incentives []

e. Ignorance of regulations [] f. Can't tell []

g. Other..... []

22. Have you made any plan to get ISO 14001 for your company?

a. Yes [] b. No [] c. Can't Tell []

23. What is your perception regarding the difficulty of obtaining ISO 14001 certification?

a. Very easy [] b. Easy [] c. No problem []

d. Somehow difficult [ ] e. Very difficult []

24. Which impediments or barriers have you met in your process of ISO 14001 implementation?

a. High investment required [] b. Management ignorance of its existence []

c. Long time of certification [] d. Lack of government incentives []

e. Ignorance of regulations [] f. Can't Tell []

g. Other..... []

25. Would you say the certification process is inconsistent with local environmental regulations or standards?

a. Yes [] b. No [] c. Can't Tell []

E. COMPLIANCE TO LOCAL LEGISLATION

26. Has your company taken environmental issues as important in its operation?

a. Yes [] b. No []

27. Would you say your organization's activity has an impact on the environment?

a. Yes [] b. No [] c. Can't Tell []

28. Are these impacts positive or negative?

a. Positive [] b. Negative [] c. Can't tell []

29. What is your level of compliance with local environmental legislation?

a. 20% [] b. 40% [] c. 60% []

d. 80% [] e. 100% [] f. Can't tell []

Appendix II: Current status of EMS adoption by Kenyan industries

Table 4.1 Current status of EMS adoption by Kenyan industries

EMS adoption	**Frequencies**	**Percentage**
Waste Management Systems	8	31%
ISO 14001	6	20%
None	6	20%
Energy Conservation	4	13.3
Eco-labelling	3	8.9%
Life Cycle Assessement	2	4.4%
Other	1	2.2%
Total	**30**	**100%**

Appendix III: Other management systems in operation other than EM

Table 4.2: Other management systems in operation other than EM

Other management systems	Frequencies	Percentage
Safety & Management	15	50%
ISO 9000/9002	9	28.90%
None	5	18.40%
Other	1	2.6
Total	30	100%

Appendix IV: Drivers for the implementation of EM practices

Table 4.3: Drivers for the implementation of EM practices

Drivers	**Frequencies**	**Percentage**
Pollution prevention	9	27.5%
Cost reduction	6	23.2%
Facilitates Compliance/Regulations	5	18.8%
International acceptance	4	14.5
Pressure from customers	3	8.7%
Cant tell	2	5.8%
Other	1	1.5%
Total	**30**	**100%**

Appendix V: Main challenges to Implementation of ISO 14001 EMS

Table 4.4: Main challenges to Implementation of ISO 14001 EMS

Main challenges	**Frequencies**	**Percentage**
High Investment Required	9	40.3%
Lack of Government Incentives	6	35.8%
Delay in Certification	5	10.4%
Lack of Management Awareness	4	9.0
It is Voluntary	3	1.5%
Cant tell	2	1.5%
Other	1	1.5%
Total	**30**	**100%**

Appendix VI: Level of Compliance to Environmental Legislation

Table 4.5: Level of Compliance to Environmental Legislation

Level of Compliance	**Frequencies**	**Percentage**
Level of compliance to environmental regulations being 40%	10	33%
Level of compliance to environmental regulations being 80%	8	27%
Level of compliance to environmental regulations being 60%	8	27%
Level of compliance to environmental regulations being 20%	4	13%
Total	**30**	**100%**