



ENVIRONMENTAL MANAGEMENT SYSTEM (ISO 14001) CERTIFICATION IN MANUFACTURING COMPANIES IN GHANA: PROSPECTS AND CHALLENGES

By

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Abstract

It is believed that environmental regulation is experiencing diminishing returns in that it is difficult and expensive to regulate pollution these days. Currently, education and voluntary measures are being used to address environmental problems. Voluntary environmental management (EM) initiative by industries was intensified worldwide with the publication of ISO 14001 environmental management system (EMS) in 1996. The adoption of the standard in developing countries, especially in Africa has been rather slow. In Ghana many environmental problems are taking place and are being intensified with industrial development however, no current attempt is made to streamline voluntary environmental initiatives in the country to international level.

The paper investigates the current EM initiatives by industries in Ghana and their motivation for adopting the system. Purposive sampling technique was used to administer questionnaires to 20 industrial establishments in the Accra-Tema Metropolitan area. It assesses current EM within the industries, benefits industries derived and hope to derive from EMS, level of compliance and hindrances to getting standardized EMS like ISO 14001. Results show industries developed EM practices like energy conservation, waste management and recycling. However, majority of the industries do not have any standardized EMS. Rationale for not getting international EMS certificate includes lack of motivation in the form of pressure from customers, consumers and government. Others include the cost of certification, its voluntary nature and long time of certification of the standard. Some industries have however made plans of getting certified to ISO 14001 in the near future.

It is concluded that certification to voluntary EMS like ISO 14001 is not likely to be effective in solving the current bad state of environment in Ghana in that, the certificate is not a performance standard but rather based on “commitment to continual improvement” which is not in existence within the industrial set up in Ghana. It is therefore recommended that enforcement initiatives should be combined with voluntary education for sustainable development.

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List of Abbreviations

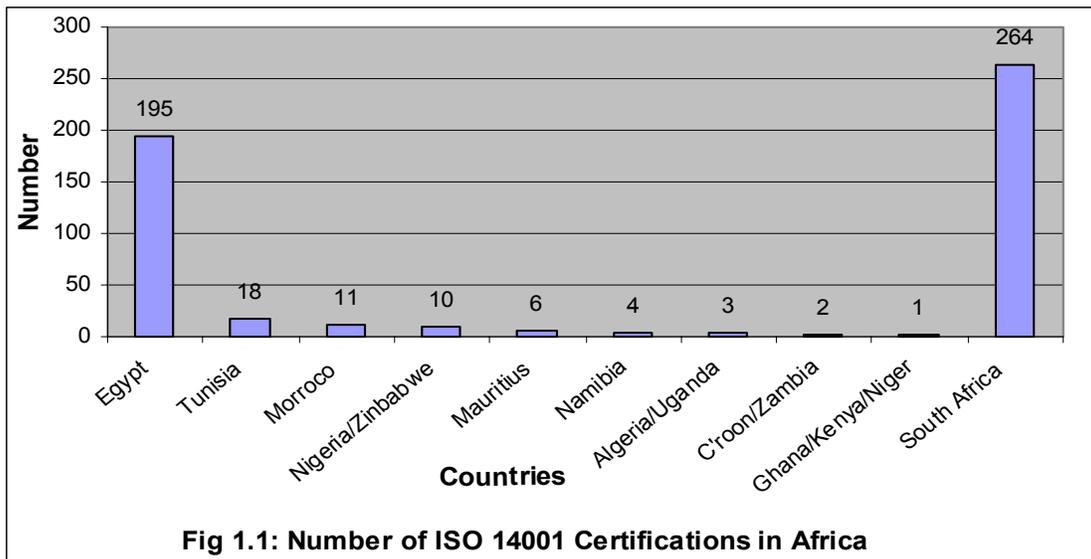
AGOA	African Growth and Opportunity Act
ATMA	Accra-Tema Municipal Area
BOD	Biological Oxygen Demand
BSI	British Standards Institute
CAC	Command and Control
CEO	Chief Executive Officer
CLD	Causal Loop Diagram
COD	Chemical Oxygen Demand
DEP	District Environmental Plan
ECG	Electricity Company of Ghana
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
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
EPA	Environmental Protection Agency
EU	European Union
GATT	General Agreement on Trade and Tariff
GDP	Gross Domestic Product
HACCAP	Hazard Analysis Critical Control Point
HRM	Human Resource Manager
IMF	International Monetary Fund
ISO	International Organization for Standardization
LCA	Life Cycle Analysis
LDCs	Less Developed Countries
LEAP	Local Environmental Action Plan
MEST	Ministry of Environment, Science and Technology
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
WB	World Bank

1. INTRODUCTION

1.1 Introduction to the Problem

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 “represent an organizational change within firms and a self-motivated effort at internalizing environmental externalities by adopting management practices that integrate environment and production decisions, which identify opportunities for pollution reduction and enable the firm to make continuous improvements in production methods and environmental performance”.

Standards for environmental management systems have been developed and evolving for several 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 and it 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 stage. Roy and Vezina (2001) also show that environmental initiatives can be used to enhance a firm's innovative capability. Sheldon (1997) also shows 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 augurs 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.



Source: ISO World, 2004

As of December 2003, about 61,300 companies have been certified to ISO 14001 (ISO World, 2004). Most of these companies are in advanced countries, with Japanese companies leading with about 14000 certificates. This country is followed by China, Spain, Germany and the U.S. The number of companies that were certified for some African countries as of

December 2003 is shown in figure 1.1 above. Only one (1) company was certified to ISO 14001 as of December 2003.

Companies in Ghana that compete with those in developed countries whose markets are characterized by high level of environmental concern and restrictive environmental legislation stand a chance to gain by adopting the voluntary environmental management standards (Noci and Verganti, 1999). 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.

A number of environmental problems have been reported and attributed to industrial establishments in the country. Prominent among them is an increase in water borne diseases, especially in the capital and industrial city of Tema (EPA, 2002). BOD and COD values as high as 4,260 and 30,200 respectively were recorded in the Odaw-Korle lagoon systems of Accra in 1995 and has been attributed to industrial pollution (EPA, 2002). Korle and Kpeshie lagoons in Accra and Chemu lagoon in Tema are all in different states of degradation. Authorities are not able to regulate these industries due to weaknesses within these agencies. They give permit for industries to be sited around water bodies with negative environmental impact on marine, coastal wetlands and inland drainage system (Doku, 2003). The study would help get EM practices industries are adopting in their operations and relate it to the current state of environmental problems. Will certification to EMS ISO 14001 lead to environmental protection and sustainable development in Ghana?

1.2 Objectives of the Study

The main objectives of the study are to examine the drivers and barriers to compliance with voluntary international standards in Ghana. To reach these objectives, the following research questions will be answered:

- ❖ Determine current environmental management practices in Ghanaian industries.
- ❖ Show the current situation with respect to the adoption of ISO 14001 standards in Ghana.
- ❖ Identify the most important drivers to the adoption of EM practices in Ghana.
- ❖ Identify the most important problems that companies encounter getting certified to ISO 14001.
- ❖ Assess the extent of compliance to local environmental regulations.

1.3 Propositions

The study relies on the following propositions for guidance:

- There is no organized structure to promote EMS in Ghana leading to self initiative by industries and organizations to put into effect their own EMS.
- There are no real drivers for the adoption of EMS in Ghana.
- The major problem hindering the development and implementation of ISO 14001 EMS in Ghanaian industries is financial other than management barriers.

1.4 Methodology

Primary data is the main source of information for the study; however, some secondary sources of data would be employed. The secondary sources of data would include books, published electronic and print journals and information from important people on environment in Ghana.

1.4.1 Instruments

A questionnaire was used to collect the primary data. It combined both closed and open-ended questions. Informal discussion was also held with environmental officers and people/organizations responsible to the environment and standardization in Ghana.

For the acquisition of primary data a questionnaire was administered to the manufacturing industries in the study area. The industries are those that have not been certified to ISO 14001 EMS. Telephone interview was held with certified companies to ascertain advantages they are enjoying for certification. The Ghana Standards Board, SGS¹ Ghana and the Environmental Protection Agency (EPA) were relied upon for information on companies that have been certified to the standard. Information on certified companies was also gathered from industries that have been certified to other standards like ISO 9001/9002.

1.4.2 Population and Sampling

Purposive sampling method was employed to collect data as most of the industries were known. The Ghana Investment Promotion Centre has been publishing names of top 100 industries in the country based on turnover and number of people employed and this formed the basis for the selection of the industries. These industries are also in the census of manufacturing activities in Ghana. The industries in the latest list², was used to collect the primary data for the study. Location of the industries was also taken into account since the survey was carried out within the Accra-Tema industrial zone.

Telephone interviews were first conducted to inform and ascertain the interest of the company in the study. Forty (40) companies were selected for the administration of the questionnaire. The structured questionnaires were administered personally to some of the directors of the departments responsible to the environment in the company. Some questionnaires were left with the personnel manager (PM) or human resource manager (HRM) of those industries whom the questionnaire could not be administered to personally. Results from 20 industries are used for the study showing a response rate of 50%. The environmental manager was chosen since s/he is in charge of the environment and is 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. The sectors the questionnaire was administered to include; Agro Food Production and Processing Cotton/Textiles, Beverages and Candies, Sea Food Processing, Energy and Petroleum, Plastic production, pharmaceuticals and iron and steel manufacturers. These sectors were chosen because they fall within the Ghana club 100 list. The mining sector was left out of the study as these industries are not within the location of the study, however, those certified to ISO 14001 have been interviewed.

1.4.3 Data Analysis and Presentation

Frequencies of the various responses is worked out, interpreted, and explained in terms of the general trends that emerged from the analysis. Relationships between variables are shown. CLD formed the basic framework to illustrate the interlinkages and feedbacks between factors to be investigated. Tables, graphs and charts is used to show the responses

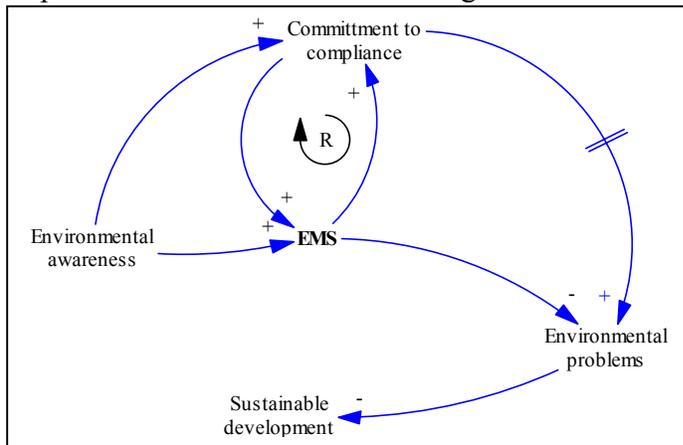
¹ Société Générale de Surveillance

² The Ghana Investment Promotion Centre is yet to publish the list for 2002, 2003 and 2004 due to sponsorship problems as at September, 2004. The 2001 list was therefore used.

and relationships graphically. Deductive reasoning is employed to arrive at conclusions in the final analysis.

1.5 Conceptual Framework

CLD is a tool of system thinking. It helps to conceptualise problems and see feedbacks between the components of a system. The components of a system are linked to each other through arrows, which demonstrate causality. The 'plus' mark at the head of the arrow means that the factor before and factor after the arrow move in the same direction. The 'minus' sign demonstrates that the factor before and the factor after the arrow move in opposite directions. 'R' in the middle of the loop, means that the factors are reinforcing each other over time and moving in the direction of growth or direction of decrease. 'B' in the middle of the loop implies that the factors are balancing each other. A cut in an arrow means a delay.

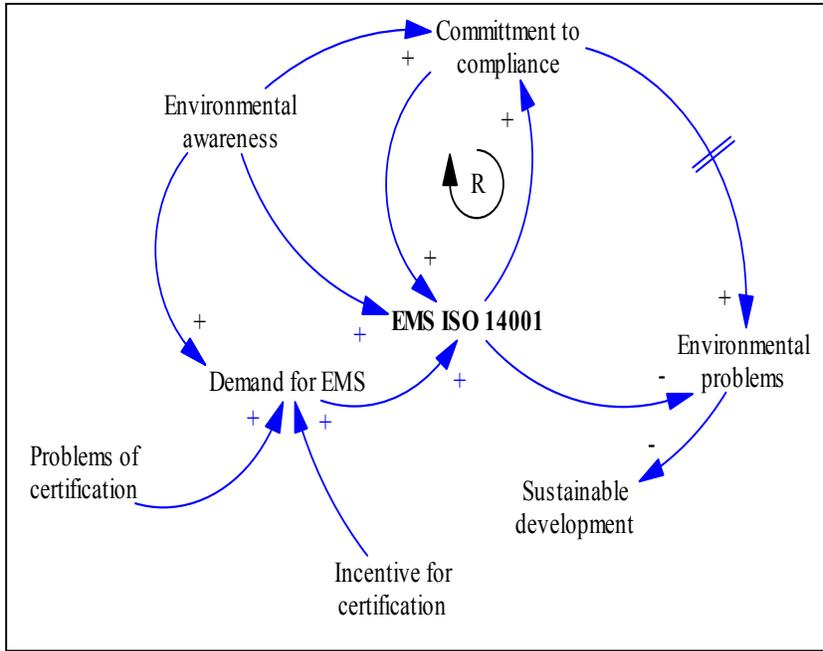


The Causal Loop Diagram (CLD) in figure 1.2 shows the problem of environmental degradation in Ghana. The low attention given environmental management by industries and authorities can be said to be the major cause of environmental problems especially by industries. About 60% of all industries are located in the Accra-Tema Metropolitan Area (ATMA) alone. There is no awareness in the country on EMS leading to low EMS.

Fig 1. 2: A CLD of the Problem in Ghana

Low awareness also leads to low commitment to comply with legislation. Since there is no commitment, there is no EMS and vice versa creating a re-enforcing loop. There is no commitment to comply with legislation couple with low enforcement leads to increase in environmental problems. There is a delay here before the problems can manifest. EMS is said to increase sustainable development. For sustainable development, there should be increase in EMS.

Figure 1.3 below provides the study with a framework of the certification process of firms in Ghana to ensure compliance to environmental regulations for sustainable development. The dominating variables in the system are EMS ISO 14001, demand for EMS, commitment to compliance to legislation and sustainable development. These are the main relationships that form the research ideas. It shows the various interlinages between the various elements within the system. The system is not exclusive to include all the elements but rather based on assumptions that these are what drives certification and compliance. Getting EMS ISO 14001 means commitment to comply with legislation. Increase in commitment and its practice will lead to low environmental problems. Currently this is not available thus the problems. If there is increases enforcement, industries will be willing to put EMS into their operations which will lead to sustainable development.



Some major factors that drives EMS implementation like government or business incentive, certifiers availability and citizens awareness through ENGOS which are lacking leading to low demand for EMS thus low certification leading to environmental problems. The use of EMS will facilitate change of environmental management.

Fig 1.3: A CLD of the Conceptual Framework

All things being equal, if Ghanaian industries and firms get certified to ISO 14001 they will abide by legislation, manage cost, and create market access thereby ensuring viable business as well as sustainable development. The main objective here is to use the system to comply with statutory and international laws and regulations, industrial norms and market specifications.

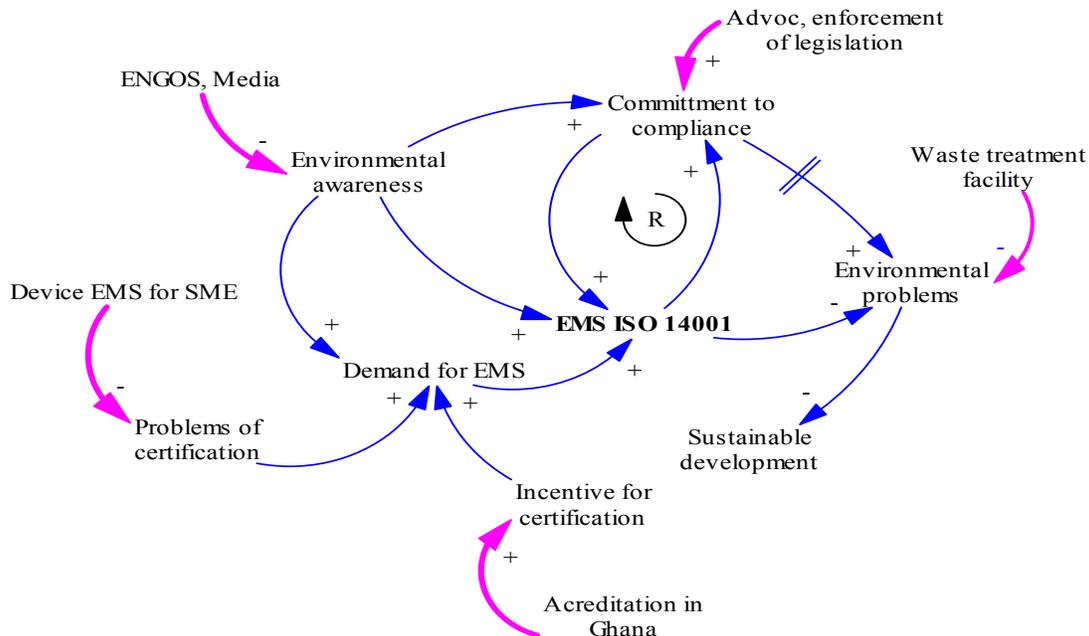


Fig.1.4: Ways to increase the use of EMS for sustainable development

Figure 1.4 shows ways of making EMS development in Ghana attractive for sustainable development. The pink arrows are means of solving the problem. When institutions and

structures for EMS are established in the form of accreditation organizations, certifiers come into the systems, competition sets in and the cost of certification will be decreased. Currently, there is high cost of certification, increase in time of certification and rigidity of certifiers leading to low certification. Awareness will be generated in both industry and among citizens, within ENGOs, media and environmental institutions leading to knowledge on the importance and benefits to be derived from EMS. They will then demand EMS from industry. Certifiers also come in to help in the process. Increasing use of EMS, in combination of other structures will increase biological activity in water system and therefore sustainability. Waste treatment within industry is also recommended to decrease pollution.

1.6 Rationale for the Study

The rationales for the study are varied but interlinked. It is to ascertain the reasons behind the low level of registration by industries in Ghana to ISO 14001. The study is thus 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 in general and sustainable development in Ghana and developing countries as a whole.

Missing in the attempt of industries and establishments in Ghana to make sustainable development a priority in their activities is the fact that industries do not have reference information that they could find relevant as far as international standards are concerned 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.

A close link has been established between the ISO 14001 standards and trade (Prakash, 1999). Developing countries are currently not benefiting from trade the way they should due to non-compliance to environmental standards adopted in industrialized countries like EU (Mihyo, 2003). To participate in, and benefit from international trade, developing countries have to get certified. However, industries in many developing countries still find it difficult to get certified (Mbohwa and Fukada, 2002). This study is aimed at ‘diagnosing’ the problem and making recommendations for future increase in certification. Results from the study would be very informative in increasing certification, to cut cost, improve the environment by way of reduction of emission and waste production for sustainable development.

Lastly, it has been indicated by Kirkland and Thompson (1999) that the introduction of an effective EMS may be affected significantly by a number of factors like skilled management and personnel, design and implementation barriers. However EMS literature has yet to recognize these barriers. According to the authors “there is a significant gap between EMS theory and application”. This study will also ascertain the veracity of such a claim using the Ghanaian industries as a case study.

1.7 Limitations to the Study

Data for the study was collected from 20 companies in different sectors of the manufacturing industry in just the southern coastal region of the country therefore making it difficult to make a clear-cut generalization to all industries in Ghana. Despite this limitation, over 60% of all industries in the country are located here.

The selection of companies was done randomly based on the Ghana Investment Promotion center’s club 100 list. 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 PM or HRM to be delivered to the person responsible to the environment. These might lead to bias in responses which ultimately affects the study.

The study data are also limited by the knowledge and personal judgment of the participants as they were obtained through personal interviews and written responses. They thus have to rely on their memories 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 are what is actually happening in the establishments.

To determine links among motivations, methods and outcomes is beyond the scope of this study. Aggregate environmental performance was expected to be measured at a point in time however, the respondents were not able to link specific management practice to comparative advantage enjoyed as a result of that practice. Despite this problem, the results provide a basis for inferring corporate EMS and factors influencing companies in Ghana to adopt EM standards and advantages they are enjoying from it.

The use of CLD for this study and in general, carries with it the structuralist view in that, it uses the actor and structure relationship as an analytical framework. Also, CLDs fail to present the actor perspective and unpredictability that accompanied human action. This limitation was supported by Spruill et al (2001) who criticise the tool of system thinking for not taking into account “*individual values, behaviour, decision-making processes and power relations*”. Despite this critique, it is a valuable tool to be used since it will enable us to show the feedbacks and interconnections between the various elements in the EMS.

1.8 Outline of the Study

The study is divided into five chapters. Chapter one is the introductory chapter and comprised the problem, objectives propositions, methodology used in conducting the research. It also includes the rationale and limitations to the study.

Chapter two is on general environmental problems in Ghana and specifically on environmental problems of manufacturing in Ghana. Some of the contents of the chapter include environmental pressures in Ghana, the impact of industrial environmental problems, approaches being used to manage the environment in the country, environmental laws and undertakings requiring registration and permit. Chapter three reviews literature on EMS and ISO 14000 series. It includes history of its development, types of environmental standards, certification system, benefits and barriers derived from ISO 14001, criticisms leveled against the standard and drivers for EMS development. It ends with gaps between EMS theory and practice.

Chapter four is on the findings and discussion of the study and includes EM standards in the industries, sources of EM introduction, benefits derived from the system, problems encountered and level of compliance to local environmental legislation. Chapter five concludes the study with recommendations.

2. THE GHANAIAN ENVIRONMENT

2.1 Introduction

Ghana covers an area of 238,539 square kilometres including inland water bodies. The country lies on the south central coast of West Africa. It lies between latitudes 4° 30' to 11° N and longitudes 1° 10' E to 3° 15' W with a coastline of 550 kilometres. The climate is tropical with high mean annual precipitation in large parts of the country, except in the extreme north where savannah climate with quite dry conditions prevails.

The population according to the population and housing census figures of 2000 was 18.8 million and likely to reach 20 million by the year 2,005. It has an urban population of 36%. The per capita income in 2003 was \$360 dollars. The structure of Ghana's economy in 2003 showed that agriculture contributed 44.4%, services 38% and industry 16.6% to the GDP. Agriculture is the most important activity in terms of employment and the generation of foreign income. Economic activity is depended on natural resource exploitation of land (cultivation), forestry and mining. The section deals with environmental problems in Ghana.

2.2 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 including Ghana to take concrete steps towards the protection, management and enhancement of the environment (EPA, 1994).

The government of Ghana since the Stockholm conference established agencies to manage its environment. The purpose of environmental management according to the EPA (2002) 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*".

2.3 Environmental Pressures Being Experienced in Ghana

There are numerous environmental problems in Ghana. Prominent among them based on the Ghana Statistical Service (GSS, 2000) are inadequate sanitary infrastructure, open defecation as a result of poverty, urban growth and development of unplanned settlements, discharge of domestic wastewater into drains, inefficient drainage systems and poor management of sewage treatment infrastructure. Others mentioned by Soeftestad (1996) include discharge of untreated and poorly treated industrial waste into surface water bodies or drains, improper citing of some industries, operation of obsolete industrial plants and equipment, concentration of industries in coastal districts, particularly Accra and Tema.

High rate of logging for the past three decades have remarkably increased the rate of deforestation and the vulnerability of freshwater resources to increasing evapo-transpiration (EPA, 2002). 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, inappropriate use of tractors in ploughing, has resulted in topsoil removal, erosion and loss of fertility.

The quest for better standard of living and increasing use of refrigerators, air-conditioning, aerosol sprays, insulation and furniture manufacture contributed to high levels of Ozone Depleting Substances (ODS) in the past. The last but not the least environmental pressure in Ghana can be said to be pollution from vehicular exhaust emissions. Most of the vehicles that ply the roads in the country are poorly maintained or are over-aged. This, coupled with heavy traffic in certain urban locations contributes 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. What then are the features of Ghanaian industries?

2.4 Industrialization in Ghana

Most Ghanaian industries can be said to be import substitution industries in that, they seek to produce for domestic purposes goods which were formerly imported. Before independence, the country depended heavily on its colonial master-Britain for industrial needs while it concentrated on the production of primary raw materials like cocoa, rubber, timber and gold. A lot of foreign exchange was used to import basic industrial goods. After independence in 1957, Ghana sought to industrialize.

Important rationale for industrialization includes the conservation of foreign exchange and income to both workers and the government. Others include the development and expansion of agriculture in the form of agro-based industries which in the long run stimulates other sectors of the economy, diversification of the economy to help reduce the reliance on agriculture products whose prices keeps fluctuating at the world market, increase self-reliance and sufficiency and employment.

Some basic features of the industries include heavy reliance on imported raw materials, financial institutions for their capital base, state owned and supported. They also rely mainly on the local market, are labour intensive, located close to coastal cities which are mostly capital towns of the country with dense population and high purchasing power.

The structure of the industries in Ghana as elsewhere is based on three structures; Small, Medium and Large. According to the GSS, firms with less than 10 employees are small scale and they employ about 85% of the manufacturing labour force; those with more than 10 employees are medium scale and take up about 10% of the labour force; and those with more than 50 employees are regarded as large enterprises and takes 5% of labour force. These basic features of industries in Ghana have led to some environmental problems in the country.

2.5 Industrial Environmental Problems in Ghana

According to the EPA, there are over 5000 manufacturing industries in the country of which half are classified as medium to large scale. About 60% of these are located in the Accra Tema Municipal area (EPA, 2002). These industries have had a large impact on the economy of the area and the country in general. The concentration of the industries in such a small area has aggravated the environmental stress caused by industrial activities. Some of the major problems include industrial liquid and solid waste, air and water pollution

2.5.1 Liquid and Solid Wastes

The quantity and quality of industrial wastes have increased over the years, however, there is hardly any waste recycling/treatment or proper management practices in the country (EPA, 2002). The major producers of industrial pollutants in the country are textiles, food manufacturing, petroleum refining and handling, and mineral exploitation and processing (EPA, 1991). Other minor sources include soap and detergents, wood, cement, rubber, plastics and steel. According to the EPA (1991) some of the industrial solid wastes produced in the country came from metal and metallurgical industries comprising ferrous and non-ferrous wastes. The textile and garment industries produce floor wastes, yarns, wax cotton fluffs and cut-offs.

2.5.2 Air Pollution (Emissions)

The major sources of these in the country are aluminium smelting, oil refining, cement-asbestos product plants; steel works, sawmill and wood processing and automotive exhaust emissions. Pollutants from combustion processes tend to be in the form of particulate matter, smog, odours and nuisance gases (EPA, 1991) all containing different amounts of gases like sulphur oxides, nitrogen, carbon and hydrocarbons. Vehicular exhaust emissions have been a significant cause of poor urban air quality over the years in Ghana (EPA, 2002). This together with heavy traffic in certain urban locations contributes to poor urban air quality.

2.5.3 Water Pollution

According to the EPA (2002) industrial water pollution is a “moderate” to “high” priority issue in 6 out of 21 coastal districts of Ghana. This can be attributed to the high concentration of industries in major coastal towns like Tema-Accra area. An assessment of the extent of industrial pollution as an environmental problem along the coasts of Ghana was based on information from District Environmental Plans (DEPs) and Local Environmental Action Plans (LEAPs). According to these plans, food processing, material processing, cooling and mining industries are the major water polluting industries in the country. The industries are the breweries, leather and tanning, and textile industries.

Table 2. 1: Water Quality of Some Selected Water Bodies in Accra and Tema

Pollution Indicator	Odaw-Korle Systems		Chemu II	World Bank Guidelines
	Food and Beverage Industry	Chemical	Chemical	
BOD (mg/l)	240 - 4260	1.0 - 380	510	50
COD (mg/l)	700 - 30200	24 - 6200	664	250
NH ₃ -N (mg/l)	1.2 - 70.5	0.48 - 10.0	28.4	15
Temperature (°C)	25.7 - 41.8	-	31	33
pH	4.0 - 11.04	6.7 - 7.6	11.9	6 - 9

Source: EPA, 1994: EMPs of Manufacturing Industries in Accra and Tema, in EPA 2002

According to Nii Consult (1998) the quality of major surface waters is generally good for multi-purpose usage. The pH of most rivers is said to be within the range of 6.3 to 7.5 however, “*surface water resources that pass through urban areas, like Accra and Tema are heavily polluted*”. This revelation has been depicted in table 2.1 above. About 30% of boreholes in the country have been found to have high iron contents ranging from 1 – 64 mg/l high fluoride levels (1.5 – 6.0 mg/l) especially wells in the north-eastern parts of the Volta

basin (GOG, 1998). These high levels have been attributed to the release of chemicals by industrial establishment in the country especially in the mining areas by the EPA.

2.6 Noise

Noise levels within and outside industries and mines in general can be a nuisance to nearby inhabitants. The most important culprit of noise production in Ghana is the mining companies. The sources of noise and vibrations at the mines include air blast, blasting of rocks, which destroys peoples' buildings, vehicles and other mobile equipments which are old with poor maintenance. Manufacturing industries do not have much problem with noise due to insulation, however, some small scale once have noise problems. The impacts of these problems on the Ghanaian environment are enumerated below.

2.7 Impact of Industrial Environmental Problems

Pollution of water bodies has led to destruction of aquatic life. There is high a rate of water-borne diseases within polluted river catchments especially within the urban areas of the country. Percentage of children reported sick with diarrhoea in Accra was 19% in 1997 but increased to 80% in 2001. Diarrhoea remains a significant cause of death in all age groups however, under five-years Mortality Rate (U5MR) has declined from 154/1000 to 110/1000 between 1988 and 1998 (GoG, 2002). According to the report, this gain was worsened by a steady rise in the number of respiratory diseases due to deteriorating air quality in urban areas.

High incidence of water-borne infections is reported in coastal communities, which is a disincentive to tourism promotion. Water pollution has increased the cost of treating water for potable and industrial usage.

2.8 Approaches to industrial Environmental Management

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 Ghana include;

- Regulations for licensing of industries; this at present is being done by the EPA. This procedure offers a viable option for prevention of pollution. The EPA requires within the license the appropriate pollution control technology the industry being licensed needs to adopt. After establishment the industries discard the technology, some promised installing but never did. This problem is compounded by the lack of instruments and staff of the EPA to seek compliance to this mandate.
- Citing of industries: the haphazard manner in which industries are sited in the country is being curtailed with the creation of industrial zones at designated areas of the country. The small scale ones are however not catered for in this development.
- Environmental Impact Assessment (EIA) of industrial Projects; this can be said to be a planning tool used to predict and evaluate the impacts of proposed projects in order to assist decision-making (Ortolano and Shepherd, 1995). The EIA comprises a series of nine steps which includes 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 emphasis treatment of impacts calling for its combination with other tools.

- 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 equipments are however aged (old) 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. The next section is on laws in Ghana for environment protection.

2.9 Ghana's Environmental Laws

The Environmental Protection Council Decree, 1974 of the existing regulatory system of Ghana was established to provide advisory services to the Ghanaian Government on all environmental matters. Ghana has put in place comprehensive legislation and regulations on environmental protection as well as some form of supporting institutional infrastructure, like ministries, bureaus or agencies. For example, Ghana has a set of environmental regulatory systems, which includes, minerals and Mining Laws of 1986, Mining regulations of 1970, Environmental Council Decree of 1974, Small-scale Gold Mining law of 1986 and the Mercury law of 1986.

The problem is that most of the national legislation or environmental protection laws are not strictly enforced, and supporting agencies of government are very 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 (Hens and Boon, 1998). 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 the EPA a new enforcement responsibility. The agency is now developing an environmental enforcement and compliance network with the participation of the police and other enforcement authorities.

2.10 Undertakings Requiring Registration and Environmental Permit

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

- An application is submitted and "No Objection" is made.
- A Preliminary Environmental Report (PER) submitted on an undertaking is accepted or,
- An Environmental Impact Statement (EIS) 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 PER and EIS.
- 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. Environmental certificate must however be obtained for operating and existing undertakings. The mandatory list for an EIA in Ghana includes transportation like roads, airports/airstrips, railways and harbours. 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, textiles to mention just a few.

2.11 Agencies Responsible to the Environment in Ghana

There are different agencies and institutions responsible for the management of the environment in Ghana making it difficult for good environmental housekeeping. Some of the agencies are the Ministry of Environment, Science and Technology (MEST). This is the major institution responsible for the environment; Environmental Protection Agency (EPA) which is an advisory institution to propose policy guidelines on issues concerning the environment, and compliance and enforcement agency. Others include the Ministry of Lands and Forestry which is responsible for policy direction and monitoring of sectoral programmes on lands and forestry issues; Ministry of Mines and Energy; Forestry Department, Ghana Wildlife Department, Ministry of Food and Agriculture, Geological Survey Department, the Survey Department and last but not the least all the District Assemblies in the country.

These numerous agencies and departments bring with it a problem of creating an institutional framework to improve environmental management. Each institution has its own mandate, activities and ambitions, which at times moves in opposing directions. Indeed public sector institutions have weak institutional capacity and inadequate incentive structure. They also have weak leadership at administrative levels, coupled with inadequate expertise in critical areas such as policy analysis, planning, budgeting and accounting due to low remunerations. Another problem is the absence of inter-sectoral co-ordination of functions in policy formulation and programme implementation and monitoring. There is also the problem of division of responsibilities between these different ministries and agencies.

2.12 The National Environmental Action Plan (NEAP)

NEAP can be said to be Ghana'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 (EPA 1994). The magnitude of ecological damage the country has experienced as a result of attempts to attract FDI triggered the need for an effective action to reduce their impacts, through the establishment of NEAP in 1991. NEAP is to "*define a set of policy actions, related investments and institutional strengthening activities to make Ghana's strategy more environmentally sustainable*" (EPA 1994). 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. The NEAP is the general framework within which the environmental regime in Ghana operates.

2.13 Voluntary Environmental Management in Ghanaian

Voluntary environmental management is inherent within the Ghanaian traditional system. Sacred groves are small patches of relict climax vegetations found all over Ghana. Since time immemorial, these sacred groves have been protected through certain traditional, religious and cultural beliefs and taboos. Some of these traditional beliefs, taboos and unwritten laws serve as regulatory mechanisms and spell out the “dos” and “don’ts” pertaining to the use of the resources in the groves. Sustainability can be said to be engrained in the way of life of the traditional Ghanaian beliefs and practices. However, with urbanization, industrialization and advent of western religious practices, these voluntary traditional practices have broken down.

Apart from forest certification, no action has been taken in Ghana to promote voluntary environmental management to ISO 14001 certification. There is however awareness raising on the benefits to be derived from energy conservation. The Energy Foundation, a NGO established to promote the use of energy efficient conservation equipments in both industry and households is making great strides in its awareness campaigns. This has been useful in cutting down the rising cost of electricity in the country. Most industries invested in power factor improvement initiatives. In addition to other management initiatives savings has been reported. This can lead to improve competitiveness of the industries within the sub-region. Of late, water management has also been embarked upon by NGOs, however, this is yet to be documented.

Waste management has been a major problem and solution is yet to be found through the establishment of a comprehensive recycling system in the country. Effluent treatment facilities within industry are non existence and if available are outmoded and poorly maintained. There is general lack of standardized EMS.

What then are ingrained in EMS that would compel Ghanaian industries to adopt the standard? 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 they are currently doing. 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 which are important problems outlined above would be controlled through the use of emission control and waste treatment facilities. Indeed majority of the problems outlined above would be curtailed through a systematic EMS. For the attainment of sustainable development-“*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*” (WCED, 1987), action should be taken now. The next chapter is devoted to the concepts of EMS based on ISO 14001 standard.

3. ENVIRONMENTAL MANAGEMENT SYSTEM ISO 14001

3.1 Introduction

This chapter deals with EMS in general and ISO 14001 particular. It begins with what EMS is, its various components of plan-do-check-act, and what motivates organizations and companies to set up EMS. It then goes to show the gap that is in existence between EMS theory and what actually is being practiced. Approaches to the different management systems are further discussed with examples of the development of the standard throughout the world. The chapter also shows the various processes of ISO 14001. It then concludes with the benefits of ISO 14001 certification and the problems hindering its usage and certification.

3.2 Environmental Management System

A very important element in understanding environmental management is to understand what the environment is (Hewitt and Gary, 1998). ISO defined the environment as *“the surroundings in which an organization operates, including air, water, land, natural resources, flora fauna, humans and their interrelation”* (ISO, 1996). Environmental Management (EM) can be said to mean different thing to different people, however Hewitt and Gary (1998) defined it as *“management of an organization’s or company’s 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). It can be said that 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 can be formal and documented. Environmental policy, to these authors, is the *“formal and documented set of principles and intentions of an enterprise with respect to the environment”*. It serves as the guiding document for environmental improvement and adherence to it is very important to the integrity and success of the EMS. Below are the components of an EMS.

3.3 Components of an EMS

EMS, according to ISO 14001 has four components. It is like a cycle of, plan, do, check, and act. If the cycle is adhered to constantly it leads to continuous improvement of the system. Figure 3.1 shows the EMS cycle which is an abstract description of the different components. The design and implementation of an EMS requires a considerable time and effort therefore requiring the commitment of management of the organization. Management needs to communicate their support to the system and emphasize that *“they aim to improve their environmental performance”*.

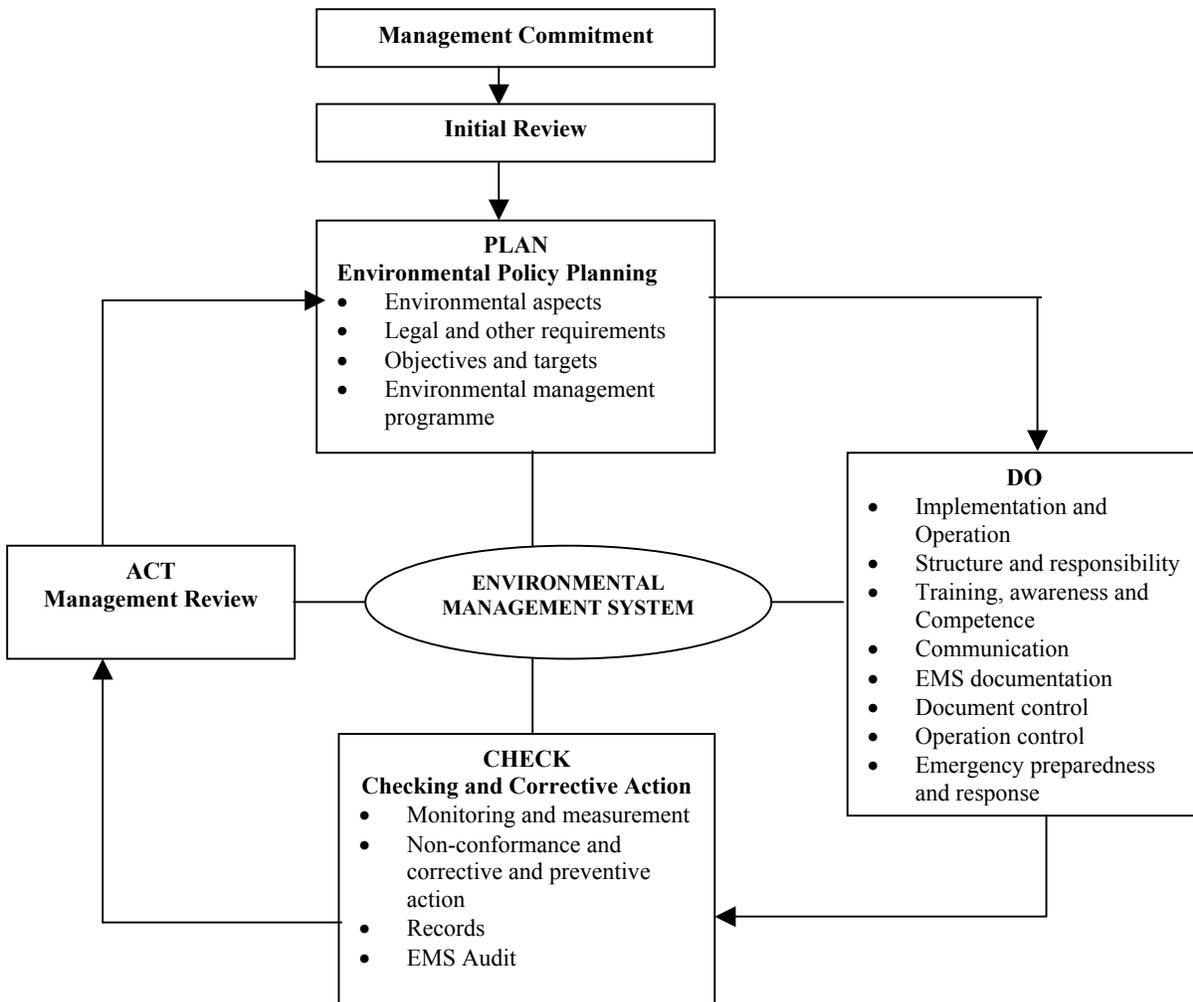
An inventory is then needed to access how the organization currently deals with environmental issues. This is the initial review and it focuses on all elements of which an EMS consists in order to see the activities that have been undertaken and with what results. Some of the topics to be treated here according to ISO 14001 include environmental impact, 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 will emerge as the system is used and the gaps that need to be filled will 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.

Figure 3.1: EMS Cycle According to ISO 14001



Source: Kuhre (1995): ISO Certification- A Practical Guide for Preparing Effective EMS.

Environmental policy and planning starts with the assessment of the environmental aspects and impacts of the organization's activities, products and services (Kuhre, 1995). Aspects can be said to be the 'potential effects', which can be good or bad. They become

impacts when they manifest themselves and lead to changes on the 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 can be identified if possible 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 can be 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.

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 can 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.

3.4 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. The drivers of EMS in industries and organizations can be grouped into two but with five different

actors. They include; the organizations themselves, market, social including the public and community, financial organizations and regulatory authorities.

3.4.1 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 Sohal (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.

3.4.2 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 that product. Industries that fail to heed such a call become uncompetitive, therefore prompting them to adopt new strategies towards the environment. This case does not apply to Ghana as the market is more preoccupied with cheaper goods than environment friendly ones.

3.4.3 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 concern especially in the DCs. The activities of environmental non-governmental organizations (ENGOS) are also becoming very vocal and serve as a driver of EMS. In Ghana, local communities may demand environmental stewardship but without appropriate ENGO or institutional backing, this will be a mirage.

3.4.4 Financial

Financial institutions and insurance companies these days demand the existence of an effective management system like EMS in order to acquire and get insurance. The existence of such a system serves as an incentive for the company to be granted the 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.

3.4.5 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. We now focused on approaches to EMS.

3.5 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 advanced countries. These instruments proved effective in controlling pollution but only few are being used in Ghana. Table 3.1 below shows some environmental instruments in Europe.

Table 3.1: Product Oriented Environmental Polices/Instruments being 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): Economics of EM

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

3.6 The Gap between EMS Theory and Practice

Whilst 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 the 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 the blending of these resources but fails to describe *“techniques that may be used to blend the ingredients into a successful whole”*. The information can be said to be good but further information is needed to develop an effective EMS especially in Less Developed Countries (LDCs) like Ghana where the practice is not 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 the need to involve and trained local experts from LDCs to gain experience in current practice of EMS for adoption.

3.7 The ISO 14000 series

ISO 14000 is a series of international standards for environmental management. It is the first such series of standards that allows organizations all over the world to pursue environmental efforts and measure performance according to internationally accepted criteria (Hewitt and Gary, 1998). It lays out tools and systems for the management of various environmental obligations and the conduct of product evaluations, without prescribing the goals an organization must achieve (Cascio et al, 1996). Table 3.2 shows the various elements in the series.

Table 3.2: The 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

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 3.2. It is aimed at supplementing environmental protection and the prevention of pollution in accordance with socio-economic needs.

3.8 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 organization’s publicly stated environmental policy and the implementation of this policy in practice*”. The standard specifies a “continuous, cyclical process” consisting of five elements as shown in Figure 3.1.

A major antecedent that led ISO to develop standards can be 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).

3.9 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. What then are the reasons for the success of ISO 14001 in Asia? One can say that, the size of firms is the major contributor to the development of an effective EMS here. Asia has large MNCs as compared to Africa and Latin America. These large companies are pushing ISO 14001 down their supply chain. 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 there 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. It can be said that 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.

3.10 Benefits of ISO 14001 Certification

EMS certification is of the management system itself, not the environmental performance (Hewitt and Gary, 1998). A company can develop EMS but will not be certified, however most companies that develop EMS do indeed certify it. Certification does not generate instant results (Hewitt and Gary, 1998). According to them, certification is not instantly beneficial to small and medium size firms as the case is in Ghanaian industries that produce strictly for the domestic market which is small compared to companies in Europe and North America. Certification of EMS ISO 14001 has the following benefits to companies. It;

- Prove that its activities have been evaluated and accepted by an accredited, independent third party. It shows that an external ‘stamp’ of approval of the EMS has been given and that, the organization’s commitment to improve environmental performance is valid.
- Shows commitment to the protection of the Environment. Possibly, the greatest positive impact to the environment will be in the reduction of hazardous waste. This would apply to reduction, reuse or recycling, all of which maximize natural resources. There is thus conservation of other natural resources in the process.
- Gives new organizations more chance with regulators that the written documentation necessary to demonstrate compliance with the regulations will be abide by. Overall, relations with regulators would improve after ISO 14001 certification. ‘The agency will know the certified organization care for the environment and has systems in place even before visiting the operation’. This positive relation is extremely valuable and would help foster a better working relationship.
- Leads to long-term cost savings, especially in the area of environmental control and cleanup of incidents. According to Kuhre (1995) certification will not eliminate all cleanup cost, however, it should minimize the number and size of future cleanups. There would also be increase in competitive position of the company. The costs would be partially offset by ‘increased customer satisfaction, trust and moral’.
- Obviously, leads to prevention of suffering and possible death by workers due to mishaps. The costs associated with injuries will also be reduced. Systems that protect or minimize impacts on the environment would in most cases also minimize impact on employees. This equates to reduced employee injuries and illness. A reduction in

injury and illness will occur if the organization includes health and safety in injury of ISO 14001 certification efforts in addition to EM.

- Increases public awareness in the environment as these is increasing days. If an organization improves its EM program, it would surely improve its community relations as well. ISO 14000 procedures are proactive environmental actions. Any proactive action that an organization does is good for the environment and could be communicated to the public since it is a positive venture. If the public is aware of these attempts, their confidence in the organization will be increased.
- Creates customer trust and satisfaction. Once an organization has the ISO 14001 certification, the customer feel more secure that the environment is being catered for. Organizations that obtain the certificate would be able to increase the market share of their products since most customers are environmentally conscious these especially in advanced industrialized countries. Certification is a little more tangible than the lip service given in many cases. ISO 14001 provides competitive edge to business.
- It levels the playing field of international trade bringing more competitors to the scene. These means companies certified to ISO 14001 have market access all over the world. In addition employment would be created in the home country thereby reducing unemployment thus poverty. Creating employment however does not mean poverty reduction as people have been employed in industries but are lowly paid thus poor.
- Insurance companies these days find it easier transacting business with companies that have effective EMS like ISO 14001 as they view such a company as having limited liability. Investors these days also try to invest in environment friendly companies.
- The standard also provides an effective means of technological development as well as its transfer to other sectors of the industry or the organization.

3.11 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. Sadgrove, in 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 impact”*. 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 Ghana 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 which is lacking in the Ghanaian situation.

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 do not help the small and medium scale enterprises in developing countries to get the certificate.

3.12 ISO 14001 and Environmental Management in Ghana

After its independence in 1957 from Great Britain, Ghana embarked on massive industrialization. There was heavy tariff protection of local industries. The economy runs into decline in the 70s with real income falling to 2%. There was economic management. The economy nearly collapsed in the 80s but was resuscitated with WB led policy of economic recovery programme. 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. Industries are being attracted daily to the country. It is expected that the current environmental problems would 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. Ghana 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 programmes 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 Ghana as experienced by industrialized countries during their early periods of development without hindering development (Munasinghe, 1999). The next chapter is on findings from the field based on our objectives and their discussion.

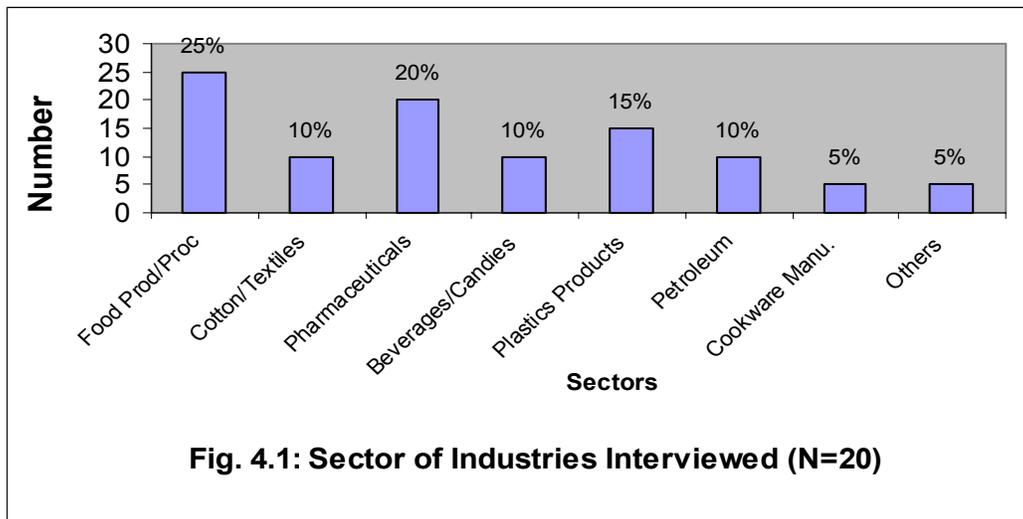
4. RESULTS AND DISCUSSION

4.1 Introduction

The objectives of the study are to determine current EM practices in Ghanaian industries, show the current situation with respect to the adoption of ISO 14001 standards, determine the drivers of EMS, seek problems companies encounter getting certified to ISO 14001, access the comparative advantage that industries with EM are enjoying compared with what they were doing before, and access the level of compliance to local environmental regulations. This chapter contains results obtained from the field in respect to the above objectives. It also includes discussions with regards to EMS and ISO 14001 development all over the world. As mentioned already, forty (40) questionnaires were administered, however only twenty industries returned the questionnaire showing a response rate of 50%. This is low but high when compared to other surveys on ISO like that of Turner et al (2000) which shows a rate of 33%.

4.2 Background and Location of the Industries

The study was carried out on manufacturing industries in the Accra-Tema Metropolitan Area (ATMA) of Ghana. About 25% of the industries surveyed falls within the food processing or production sectors. The pharmaceutical industries took 20%. Plastic products are becoming a very lucrative and important sector of the Ghanaian economy as a result of the presence of the oil refinery and it took 15% of respondents. The cotton/textiles industries, petroleum and beverage industries took 10%. Others include cookware manufacturing and iron and steel manufacturing as shown in figure 4.1 below.



Source: Field Work, 2004

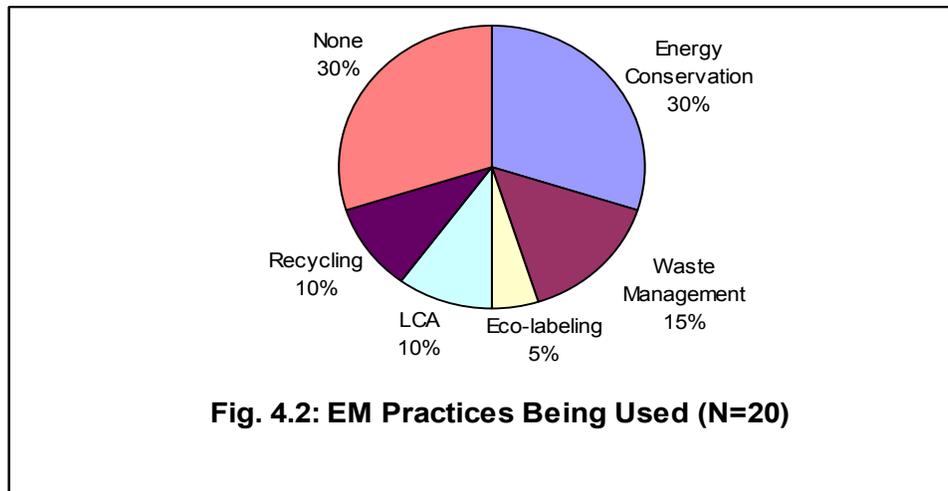
About 45% of the industries were located in Accra whilst the rest were located in Tema, the industrial and port city of Ghana. This city is the only planned city in the country. Industrialist finds it easier establishing their industries here as it is accessible both by sea and land. The industries also enjoy a lot of comparative advantages of this localization of industries in the area. Indeed, the area is the largest free zone area in the country. About 30% of the respondents are production managers, 25% quality managers. Only 15% of the respondents said they are environmental managers of the industries. 10% are personnel

managers. The rest were CEO, HRM, and health and safety managers. One could not specify his/her status.

4.3 Current EM Practices in Operation

The survey revealed that the industries do not have any standardized EMS. There are a number of companies, according to officials of the EPA that are implementing a variety of measures such as pollution control, waste management, energy conservation, water management, material resource conservation and various localized EM. Our survey (figure 4.2) shows that about 30% of the companies do not have any EM practice in their operations. Some (30%) said they practice energy conservation. This form of EM practice can be attributed to the energy crisis that the country is facing as a result of the perennial low level of water in the Volta Dam which is as a result of low rainfall in the country.

The Electricity Company of Ghana (ECG) has to ration power to the companies forcing majority of them to resort to the use of fossil fueled power generators with its attendant environmental problems. Coupled with this is the high tariff increment (100%) on electricity by the government in 2003. Companies were therefore compelled to curtail their energy use to save cost. Waste management is reported in the survey as a form of EM practice in the country. Only one company has been found to have effective and functioning effluent treatment plant. The municipal authorities are facing a lot of problems managing waste as no effective waste management system is in operation.



Source: Field Work, 2004.

Recycling and LCA is also reported but these are on the low side when compared to practices in other countries like Nigeria, Cote d'Ivoire and Zimbabwe (Mbohwa and Fukada, 2002). The most important products being recycled are paper and scrape metal into iron rod. Rubber recycling is yet to take centre stage in the country. These findings confirm our proposition that, there is no organized structure to promote EMS in Ghana leading to 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 leading to the numerous environmental problems in the country.

The study also revealed that the industries used different management systems. Some of these management systems include health and safety standards which formed 10% of the responses. The major management system in operation in Ghana at the moment is the ISO 9000/9002 which took 30% of the responses. This finding is interesting and can be attributed

to the gateway project the government is propagating for export to the EU and the African growth and Opportunity Act (AGOA) of the United States government to facilitate trade between some African countries and the US. The survey however showed that about 40% of the companies are exporters to developed countries of Europe and America. Thirty (30%) of the industries surveyed said they did not have any form of management system in place whilst 30% also said they have other systems. These findings when contrasted with developments in other similar African countries like Egypt, Zimbabwe and Nigeria shows that Ghana is far lagging behind in the development of EM systems (Mohamed, 2001, Mbohwa and Fukada, 2002). The situation however looks bright with the setting up of SGS in the country. Others would soon follow this cue. It is yet to be known if ISO 9000/9002 certified companies will take a cue to get ISO 14001 in order to maintain excellence and leadership by moving to a higher management system in Ghana. They have benefited from the experience of setting up a similar structured management system as such will not find it difficult setting up ISO 14001.

4.4 Rationale for the Development of EM Practice

The reason for choosing a particular strategy of action in business is very important for industries. The rationale for the adoption of EM can be internal and external as discussed already. The study therefore seeks to ascertain the reasons why industries try to use EM in their operations as it is also part of our proposition there are no real drivers to promote EMS in Ghana. Table 4.1 shows that 20% of the current EM practices are derived from their parent organization. These parent organizations are outside the country. Market opportunities especially in EU compelled some of the industries to embark on EM. These responses might come from industries that export substantial amount of their products or are suppliers to industries in the EU. The EU market is very important as this market is the major exporting market to Ghanaian export processing firms and as the market here is very sensitive to environmental issues (Wall et al., 1998) they have no alternative but to use the system, however, these industries are few compared to the industries that produce for local consumption. Cost reduction and international trade barriers took 15% of responses of the companies. These responses are well known rationale for implementing EMS all over the world, and are even a major reason for the setting up of ISO 14001 (Kuhre, 1995).

Table 4.1: Motivations for Implementing EM

Response	Number	Percentage (%)
Parent organizations	4	20
Compliance to Regulations	1	5
Market Opportunities	3	15
Cost Reduction	3	15
Management/Organization	2	10
International Trade Barriers	3	15
Shareholders	1	5
Increased revenue	1	5
Can't tell	2	10
Total	20	100

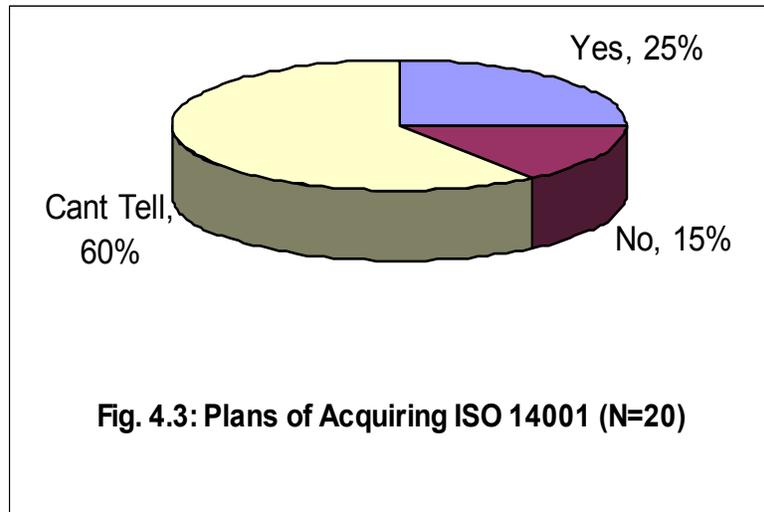
Source: Field Work, 2004

Compliance to legislation, shareholders and increase revenue are among the lowest drivers for the setting up of EM within Ghanaian industries. This can be contrasted with findings by other authors like Patton and Baron (1995), Madsen and Ulhoi (1999) and Van

der Veldt (1997, UNC and ELI, 2001). They pointed out that compliance with legislation and the consequent reduction in the risk of sanctions were the major driving forces in EMS implementation in Europe. It can be seen that no major driver of EMS outweighs the responses backing our proposition that there are no real drivers to promote EMS in Ghana. These findings are in contrary to what exist in developed countries of Europe and America. But the question is whether compliance to legislation is being adhered to. It has been revealed to the researcher that, companies close to the sea at times empty untreated waste water into the sea. They find it easier to do this as treatment of waste increases cost thus reduces profits. What is more enforcement and monitoring is very poor in the country giving leverage to the industries to indulge in these acts.

4.5 Certification to ISO 14001 in Ghana

The web site of ISO on August 2004 showed that only two Ghanaian companies have registered and were issued with ISO 14001 certificates. Our survey interview with industries however shows that four companies have been registered to ISO in the country. This finding indicates very little progress in the setting up of EMS in Ghana. One other company however is in the final stage of getting the certificate. It was discovered in the field that, these four ISO 14001 certified companies are subsidiaries of ISO certified MNCs in Europe. These companies said they were asked to get certified as they are suppliers to companies in Europe and America. According to Mbohwa and Fukada (2002), subsidiaries of certified companies in Europe and America have tended to take a lead in setting up EMS and this is the case in Ghana as well. It was also discovered that, a certifier-SGS international certification services- is doing brisk business certifying companies mainly for ISO 9000/9002. This is an encouraging development; however, SGS is yet to fully develop ISO 14001 in Ghana. They rely on other country's staff to help them in the country. They are yet to put into effect EMS certification in Ghana. One company reported about \$143,000 dollars savings annually as a result of EMS implementation. "We have drastically reduced spillage from our operations". Asked to compare the savings with the cost of implementation, he said it would take some years before they can recoup what they have invested.



Source: Field Work, 2004

These findings aside, 25% of the respondents said they have set up plans to acquire the certificate. What is interesting is that most of these companies have been certified to ISO

9000/9002 quality management system (QMS). They have the expertise and setups to get the ISO 14001 certificate without putting in new management structures.

Some industries as well have no plan of setting up ISO 14001 in their establishments. These might be the local industries that do not have any ambition to get into the international market where competition and regulations exists compelling manufacturers to be competitive. This also re-enforces proposition that there are no real drivers to promote EMS in Ghana. The sad aspect of the finding is that about 60% of the respondents can not tell whether there are plans of acquiring the certificate. These respondents might be the industries that do not have environmental managers in their establishment. It is interesting to note here that, only 15% of the industries surveyed have department/personnel responsible to the environment. Thirty (30%) of those who answered the questionnaire are production managers while 25% are quality managers.

4.6 Benefits Hope to Derive from ISO 14001 Certification

Strategies firms and organizations used to derived competitive advantage are well established (Barney, 1991). The ability of industries in Ghana to gain competitive advantage can be said to be related to issues of “*marketing research and strategy, the development of new products, technologies and processes, and the manufacturing and operation strategies adopted*” (Simpson et al, 2004). The literature on ISO 14001 however shows that, industries or establishments stand to gain by adopting the system in their operations. The current study thus seek to know if Ghanaian industries have such awareness of the benefits of ISO 14001 adoption. It was found out that 30% of the enterprises hope to derive international acceptance of their products should they get certified to the standard.

Table 4.2: Benefits Hope to Derive from ISO 14001 Certification

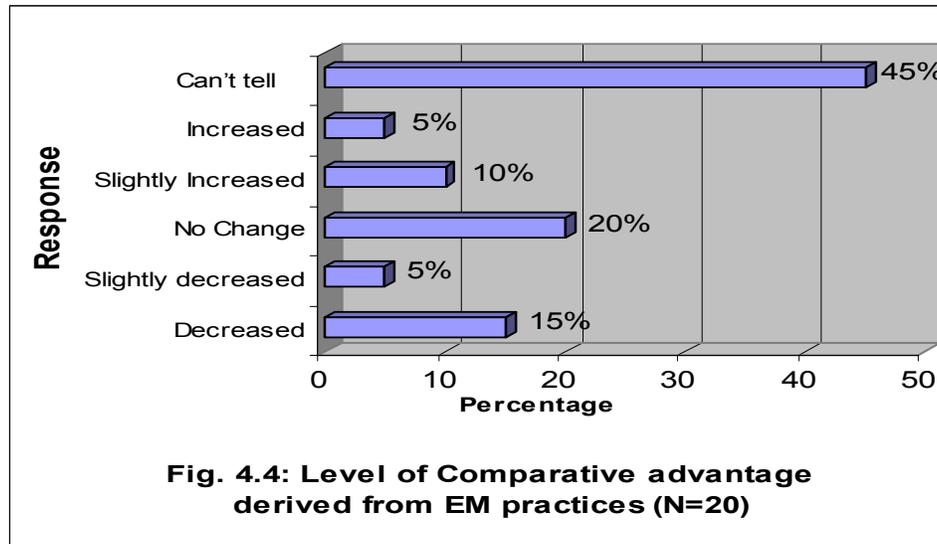
Response	Number	Percentage
Cost Reduction	4	20
Pollution Prevention	3	15
Good relation with Regulators	2	10
International acceptance of products	6	30
Increased competitive advantage	3	15
Improve self regulation	1	5
Compliance to regulations	1	5
Can't Tell	-	-
Total	20	100

Source: Field Work, 2004

This response is very important for Ghana’s economy as increased international trade will not only bring foreign exchange but also lead to the employment of the large unemployed youths. Twenty (20%) percent also pointed out that they stand a chance of gaining through cost reduction when they adopt the standard. This finding is similar to that observed by (Raines, 2002) in her international survey of the benefits of certification to ISO 14001.

The rest of the respondents gave various responses like pollution prevention and increased competitive advantage (15%) respectively; good relation with environmental regulators (10%), improved self image and compliance to regulations took mere 5%. These findings are in line with what has been reviewed in the literature that ISO 14001 has the tendency of leading to advantages to companies and the environment (Hewitt and Gary, 1998, Kuhre, 1995, Sayre, 1996).

With regards to level of comparative advantage the companies practicing EM derived, the study revealed that 45% of the respondents could not tell whether the practice yielded any result or not. This sad situation can be attributed to the low level of management practice in the country (Söderbom and Teal, 2004). These authors concluded that “*controls for workers’ education, age and tenure, have differences in observed human capital and may map into productivity differences*”. This is the situation in Ghanaian industries and this have to change if ISO standards are to be effective in the country. Only one firm observed a decrease in comparative advantage with the use of EM whilst 10% said they observed slight increment. Together, 20% of the firms confirmed a gain with the use of EM while 20% observed no change at all.



Source: Field Work, 2004

It is worth mentioning that certified companies in Ghana claimed they are yet to get any comparative advantage with respect to the adoption of certified EMS as they have got the certificate quite recently. A respondent from a certified company pointed out that, they have however reduced emissions to air as a result of the adoption of the system. Waste has also been minimized and they now practiced recycling of both water and heat all leading to the reduction of cost. The environmental manager of a certified firm pointed out that, “they do not produce consumer goods but rather building materials as such, their EMS is just for internal management and compliance to local legislation”. One also pointed out that “we formally experienced accidents like chemical spillage, discharge to water but with certified EMS, these are things of the past”. We are now in harmony with our community”.

4.7 Impediments to ISO 14001 Implementation

A major objective of the study is to ascertain the problems industries face in their attempt to get certified to ISO 14001. All the companies interviewed mentioned a number of problems in the process of getting ISO 14001 for their firms as shown in table 4.4 below. About 20% of the companies cited the high initial cost of acquiring the certificate as hindrance to setting up ISO 14001 EMS. This has been reported by Davy (1997) in his work ‘EMS: ISO 14001 issues for developing countries’ in Sheldon (1997). It also buttresses our proposition that the major problem hindering the development and implementation of ISO 14001 EMS in Ghanaian industries is financial other than management barriers. Indeed, given

the costs of registration, combined with the costs of consultancy expertise and auditing which Ghanaian consultancy firms are lacking, it is unrealistic to assume that any small and domestic operation like Ghanaian industries would be able to certify its EMS without outside financial assistance. Turner et al (2000) also shows that larger firms are likely to spread cost of certification to ISO 14001 and other standards thus able to benefit from certification. This finding shows a strong relationship between size of firms and certification to ISO 14001 and other international standards. If Ghanaian firms are small in number and are geared towards import substitution, then they are better off not certifying to international standards. The point is that they are now under competition from trade liberalization as such has to be competitive.

This response is closely followed by the long time of certification (15%). Some companies said they spend long time getting people to help them in the certification process. Man hours are spent which could have been used in other productive ventures. Lack of government incentive also took 15% of the responses. This response is not far fetched as this is one of our proposition and major pillar of our conceptual framework. In a number of advanced and developing countries, government institutions have helped to put EMS functioning. They laid important infrastructure for industry. This infrastructure led to increase improvement in environmental performance especially with energy use, water management, pollution and technology use (MAC, 1998). Developed countries that have got their industries certified to ISO 14001 developed structures and gave incentives to the industries to develop EMS. In Europe and America, as the case is in Asia, regulatory agencies including business 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 are also taking a number of measures to promote the use of ISO 14001 (Yano, 1998). The Ghanaian case is different leading to the low certification. ISO 14001 is a voluntary initiative as such it’s not obliging on firms to get the certificate and this has featured in the survey.

Table 4.3: Impediments to Acquiring ISO 14001 Certificate

Response	Number	Percentage
High Investment Required	4	20
Management Ignorance of Benefits	2	10
Long Time of certification	3	15
Lack of Government Incentive	3	15
It is voluntary	2	10
No certifiers	1	5
Procedures involved	1	5
Annual cost of maintaining certificate	1	5
Inadequate personnel to help in EMS	1	5
Lack of Publicity	2	10
Total	20	100

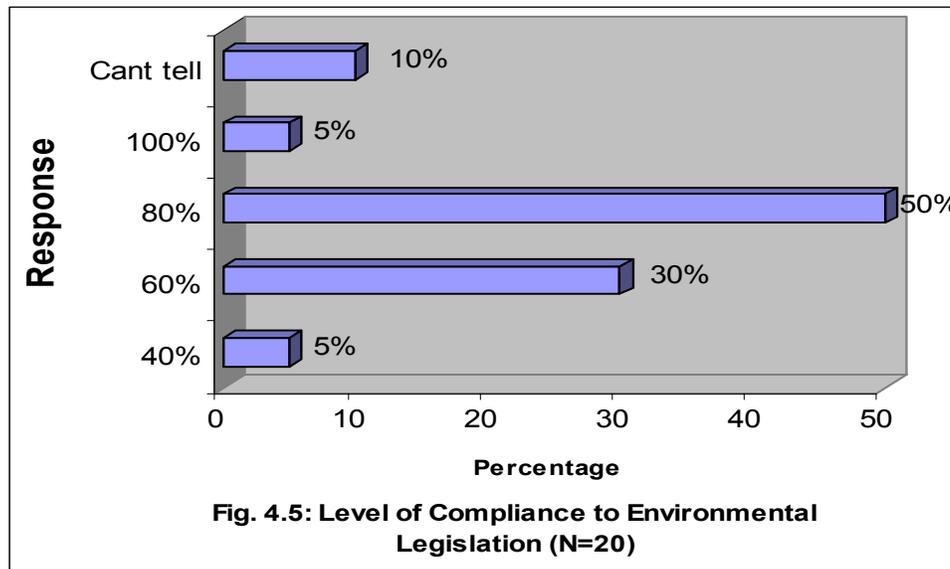
Source: Field Work, 2004

Other responses to the reasons why industries and organizations in Ghana have not yet embrace the standard include long procedures involved, no certifiers, cost of maintaining certificate and inadequate personnel. It has been found out in this study that, some of the companies do not have personnel responsible to the environment as such they depend on other staffs who are not environmentalists to undertake environmental issues. Qualified

environmental managers would be in a better position to use the procedures involved in EMS. It is true that, the cost of certifying EMS is high and beyond the scope of Ghanaian industries manufacturing mainly for domestic market. For example, Post and Altman (1994) in Zutshi and Sohal (2002) pointed out that “capital cost is a major barrier to certification”. Survey results by these authors showed that firms spent around \$10,000 to \$50,000 to get the certificate depending on their size. In Ghana, certified firms said they spent around \$40,000 getting the certificate. This is beyond the means of Ghanaian firms who are import substitution industries. It is however important to note that, the size of the firm and maturity of the management system will influence these cost which the Ghanaian industries do not have increasing their cost of the certification, leading to low certification.

4.8 Level of Compliance to Legislation

EM in Ghana 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 is a problem. As can be seen from the figure below, 60% of the respondents pointed out that their level of compliance to environmental regulations is 80% and a whopping 30% said 60%. What is interesting is that 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 establishments interviewed with substantive environmental managers have however lamented on the type of technology at their disposal when compared to that of the industrialized countries in Europe and America as a major hindrance to adopting good EM. They claimed they use ‘discarded³’ technology from industrialized countries.



Source: Field Work, 2004

What makes the situation worse is that, only 10% of the responding industries have a functioning waste treatment facility. Efficient regulatory system would push industry to divert

³ Second hand equipments which industrialized industries could not use as a result of age and development of new technologies.

resources to more productive and sustainable environmental techniques. This finding is unacceptable based on discharge of untreated waste into water systems in the urban areas of the country. This study is not suggesting that ISO 14001 certification would lead to compliance to regulation, reduce waste, energy use and lead to sustainable development in Ghana as no study has yet been made on ISO 14001 leading to improved environmental performance and improvement. What is more, the standard itself is not a performance standard but commitment to comply which is not likely to lead to improved environmental management in Ghana. This point has been buttressed by Morrison et al (2000), who argued that ISO 14001 certification alone does not guarantee environmental improvements. "It would therefore be premature to talk of regulatory relief".

Ghana finds itself in a dilemma to protect the environment for posterity. It seeks to attract industries from developed countries to provide employment, income and revenue to attain economic development. At the same time, the industries also seek to increase profit by minimizing cost. As EMS is seen by them as increased cost to their operations and do not have the means of adopting the right technology they pollute the environment (Krut and Gleckman, 1998). This problem makes it impossible for government agencies to fine industries polluting the environment in the country. The government is faced with a problem; sanctioning a polluting industry through fines or closure means unemployment to its citizens and lack of revenue for economic development. A tighter legislation will repel industrialist from investing in the country. This study is not suggesting that legislation is not good; it can act as an incentive to improve environmental performance. Indeed, legislative attempt at making industries to demonstrate and ensure that they are using the best available technology and using the best environmental option will make possible for industries to use the best EMS necessary for development. This systems based approach as shown in the CLD of figure 1.3 has its implications of serving as a tool for increased certification, with spill-off in exports for revenue for local development for poverty reduction but not for environmental protection in Ghana.

Findings from this study show that, ISO 14001 will not be a viable option now for Ghana to protect the environment. Some of problems of the certification process include lack of personnel and finance, systems and structures in place, culture, attitude, inadequate drivers, low information and size of the industries. Some of the industries find standardized EMS of too much administrative burden they can not afford. Those with EMS are suppliers to companies abroad and have been forced to adopt the standard. This was done with good intentions however; they would not yield results if there is no commitment to change management systems. The focus should therefore be on environmental performance but not on the type of tool being used or implemented in the industry.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Major issues emerging from this study on EMS ISO 14001 in Ghana shows that certification by Ghanaian industries is more difficult, more complex as most of them are small scale in nature. Companies in Ghana have developed some form of EM practices like energy conservation, waste management, LCA and recycling which are all inherent within standardized EMS like ISO 14001 even though they are not certified. Four companies have been found to be certified to the standard. Market is a major driver of EMSs in developed countries; however the Ghanaian market is not a driver as the citizens are more concerned with meeting their basic needs than satisfying “luxury” leading to low certification as put in our propositions. Currently people focus more on employment opportunities rather than environmental issues. Public opinion in environmental issues might be there but cannot be heard as a result of uncoordinated nature of the systems involved-media, NGOs, regulatory institutions and the industries leading to low certification.

Financial opportunities and insurance markets are not well developed in Ghana to act as driver of EMS. What is more, insurance companies are yet to grasp EMS as a measure of insurance. Furthermore, ISO 14001, with its international dimension provides economies of scale and potential competitive advantage for international companies; meanwhile, most Ghanaian industries are import substitution in nature. They do not see any merit getting certified to international standard. Regulation as a driver to environmental protection is low due to bribery, corruption and weak enforcement mechanisms leading to environmental problems. *Certification to ISO 14001 EMS alone cannot guarantee sustainable development in Ghana because certification does not promote that performance levels will be met or even make it possible to determine an organization’s regulatory compliance level.* Nothing about the organization’s actual environmental performance is mentioned within the standard apart from third party verification which can be grossly abused in a developing country like Ghana.

There are no structures in place to promote EMS within any of the numerous environmental agencies in Ghana leading to self initiative by industries to put into effect their own EM practices as put in our propositions. The standard board has not got a department responsible for the environment. The EPA established a desk for EMS but has not made it a priority as compared to EIA and EMP. The association of Ghana industries is promoting energy conservation but not general EMS. There is therefore no incentive for industries to take their own initiative to establish structured EMS. What is more, large part of ISO 14001 requirement is closely related to management structures like records keeping, management review processes, communication methods, assigning responsibilities, auditing, training and environmental health and safety policy which are all present in Ghanaian industries. However, integrating EMS into their traditional management means a major overhaul of the management system which industries and organizations in Ghana can not afford to do ‘disfranchising’ them from the certification process. More so, environmental managers have a major role to play in the ISO 14001 process, however, only few of the industries have environmental managers.

Finance to get the certificate and maintained it is another reason for low certification in Ghana. Certified companies spent between \$20,000 and \$40,000 US dollars to get the certificate. Due to lack of practical experience in environmental issues, enterprises often need external assistance and advice in implementing EMS. Moreover, institutions which will provide consultation on EMS are not in existence. The foreign companies come with

equipments to test effluent and emission levels. The money used in these exercises is huge deterring industries to get the certificate. The above problems are compounded by the intricacy in showing how ISO 14001 can help in environmental performance and sustainable development. Authors like Wells and Galbraith (1999) shows that companies achieved significant environmental improvement as a result of EMS certification whilst others like Berkhout and Hertin (2001) shows that companies with EMSs probably are not better than those without. *The point is that the ISO 14001 is not a performance standard but rather based on "commitment to continual improvement". Commitment is at times overlooked, a situation very paramount in Ghana. EMS will therefore not work in the Ghanaian setting looking at commitment of companies to improve environmental performance.*

Industries in Ghana derived comparative advantage from adopting their EM practices. However, majority of them could not show the fruits of the practice. Management systems within local industries are poor making it impossible to compare advantages derived from the practices. Four companies have been found to be certified. These certified firms could not derive comparative advantage with respect to the adoption of ISO 14001 EMS because of the limited time of certification. The however attested to some gains now. It has been found out that compliance to applicable laws and regulation is a problem to industries. There is no commitment on their part as this would lead to cost. It can be said that the relatively low level of environmental regulation, together with low enforcement mechanisms gave industries little incentives for environmental protection. Good regulatory system would make industries to divert resources to more productive and sustainable environmental techniques.

As a concluding remark, *EMS through ISO 14001 certification will not serve as a viable option for environmental protection and sustainable development in Ghana based on its inherent problems and the nature of industries in Ghana.* The goal therefore should not just be the number of certificates a country has but how aspects are managed, how companies set targets and achieve performance objectives. Ghana can learn important lessons from the experiences of the industrialized nations, and devise development strategies that can "tunnel through" any potential EKC—thereby avoiding going through the process of the developed countries. Industries must greatly improve their environmental performance by effectively integrating environmental considerations into their activities. EMS can further this integration, but, it is not the ultimate driver. Its usefulness depends on the commitment to comply with the applicable laws of the country and how the laws are made and enforced. The degree to which EMS will actually lead to significant and measurable advances in environmental protection for posterity will explicitly depend on how the recommendations expressed in this study are addressed.

As a policy option, it is recommended that institutions should be established to enable implementation of EMS certification. The Ghana Standards Board should establish EMS within its departments since it is the only local standard body. It should then seek accreditation and act as a third party certifier. The current trend of seeking certification outside the country would be reduced if local firms are accredited, therefore reducing the need for foreign currency expenditure for certification purposes. Association of Ghana industries should educate on EMS. EPA should provide education on EMS.

Enforcement of legislation is a problem in Ghana. To enhance good environmental quality, enforcement of applicable legislation should be combined with education on voluntary EMS. Good policy environment, collaboration and communication between stakeholders in the environmental field should be fostered as this is hampering progress, involvement and mutual trust among stakeholders. Certification services by accredited entities should be encouraged since this would create competition and reduce the cost of certification.

Results from the study shows that, there is weak knowledge transfer between developed and developing countries with respect to EMS development and implementation. More partnerships should be established between developed and developing countries to facilitate knowledge transfer and to equalize the resource burden of adopting standardized EMS but not just certification. Some mechanisms for putting into effect this recommendation include multi-lateral funding and company-to-company partnerships. Mentoring programs should be establish in which companies within a particular industry help a firm in a less developed country offset the costs of implementing EMS.

The study has shown that environmental issues in Ghana take back stage to politics. There is low environmental awareness. However, the ultimate success of integrating EMS with regulatory initiatives may depend on the extent to which there is involvement from ENGOS, environmental institutions, media and communities. More government efforts and resources should be directed toward addressing ENGOS' and the general public's lack of understanding of EMS. The government and its agencies have to build additional components around the current compliance initiatives to achieve regulatory compliance.

The result shows 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. There should be a possibility of implementing joint EMS by SMEs that can not afford the single system. SME's needs should be taken care off in the EMS development since they abound in LDCs and are major part of the problem.

The study could not prove if standardized EMS results in significantly improved environmental performance, leading to decrease environmental impacts. The reliance on EIA, EMP and market incentives to influence environmental management is highly recommended, however this is not adequate in solving environmental problems in the country. It is essential for Ghana EPA, industrial associations, ENGOS and the media to embark on continued and ad hoc monitoring and inspection of factories for water pollution and hazardous wastes measurement. All industries need to establish waste treatment facilities to prevent or minimize pollution. Means should be found to include EMS within the Ghanaian environmental regulations. The sustainable use of resources could be encouraged through legislation, regulations, education and awareness creation programmes as well as the enforcement of existing regulation and legislation.

5.2 Suggestions for Future Research

EMS is a new area of strategies for EM in LDCs and more research is needed in sectors that have significant impact on the environment and rural livelihoods like the mining sector. EM within the SME enterprises in LDCs is also needed. It is essential to examine how auditors perceive EMS within SMEs in LDCs. 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.
- Prakash, A. (1999): A New-institutionalist Perspective on ISO 14000 and Responsible Care”, *Business Strategy and the Environment*, vol. 8, 322–335.
- 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.
- Davy, A. (1997): EMS: ISO 14001 Issues for developing countries In *ISO 14001 and Beyond*, Sheldon C (ed.) Greenleaf: Sheffield.
- Doku, M., H. (2003): *Proposal on Cleaner Technologies for Sustainable Development in Ghana*. Expert Group Meeting on Cleaner Technologies for Green Chemistry and Promotion of Related Projects, Trieste, Italy. Ministry of Environment and Science, 26-27 May.
- EPA (1991): *Ghana Environmental Action Plan (Vol.1)*. Environmental Protection Agency, Accra Ghana.
- EPA (1994): *Ghana Environmental Action Plan (Volume two) Technical Background Papers by the Six working Groups (Ed. Liang, E.)* Environmental Protection Council, Accra
- EPA(1995) Ghana: Industrial Waste Study-Progress Report, GOPA and Environmental Protection Agency, Accra Ghana.
- EPA (1997) Newsletter Volume 1 Number 6, Environmental Protection Agency, Accra, Ghana.
- EPA (1999) Proposed National Environmental Quality Standards and Monitoring Requirements for Industrial Effluents, Air and Noise Level Regulations, Environmental Protection Agency, Accra Ghana.
- EPA (2001): Report on Ground Water Monitoring in the Western Region, Accra.
- EPA (2002): *State of Environment Report 2001*. Environmental Protection Agency, Accra Ghana
- GoG (1998): Strategic Plan To Roll Back Malaria, Ministry of Health , Accra.
- GoG (2002 Report of Health and Disease Analysis Task Team, Ministry of Health, Accra

- Ghana Statistical Service (2000): *2000 National Population and Housing Census*, Government of Ghana, 2002.
- Hens, L. and Boon, E. K. (1998): *Institutional, Legal and Economic Instruments in Ghana's Environmental Policy*. Human Ecology, Universiteit Brussel, Belgium.
- 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 Organization for 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>, Date Accessed, 26/05/2004
- 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
- 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*, Vol. 9, No. 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.
- Munasinghe, M (1999): *Is 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 Vol. 1*. Accra.
- 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*, Vol. 7 No. 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*, Vol. 9, No. 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): *Ghana Sector Work On Integrated Coastal Zone Management*. 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.

- University of North Carolina at Chapel Hill and Environmental Law Institute (2001): *Drivers, Designs, and Consequences of Environmental Management Systems*. Research Findings to Date From the National Database on Environmental Management Systems, University of North Carolina at Chapel Hill and the Environmental Law Institute In Cooperation with the US EPA, and the Multi-State Working Group on Environmental Management Systems, US. Accessed 15/192004
<http://ndems.cas.unc.edu/document/NDEMS2001Compendium.pdf>.
- Van Der Veldt, D. (1997): Case Studies of ISO 14001: A New Business Guide for Global Environmental Protection. *Environmental Quality Management* Autumn: 1–19.
- Wall, E. Weersink, A. and Swanton, C., (1998): *Ontario Agriculture and ISO 14000*. Report Prepared for the Ontario Farm Environmental Coalition and the Ontario Federation of Agriculture, Ontario.
- Welford, R. J. (1996): *Corporate Environmental Management: Systems and Strategies*. Earthscan, London.
- Wells, R.P and Galbraith, D. (1999): Proyecto Guadalajara: Promoting Sustainable Development through the Adoption of ISO 14001 by Small and Medium Sized Enterprises. *Greener Management International* 28:90-102.
- WCED, (World Commission on Environment and Development) (1987) *Our Common Future* (The Brundtland Report), Oxford University Press, Oxford/New York.
- Yano, T. (1998): Overview of ISO 14000 Development in Asia, *ISO 9000 News*, January.
- Yiridoe, E. K., Clark, J. S., Marett, J. E., Gordon, R., Duinker, P. (2003): ISO 14001 EMS Standard Registration Decisions Among Canadian Organizations. *Agribusiness*, Vol. 19 (4) 439–457.
- 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.

APPENDIX

QUESTIONNAIRE ADMINISTERED

LUND UNIVERSITY INTERNATIONAL MASTERS' PROGRAMME IN ENVIRONMENTAL SCIENCE, SWEDEN

ENVIRONMENTAL MANAGEMENT SYSTEM (ISO 14001) CERTIFICATION IN MANUFACTURING COMPANIES IN GHANA: PROSPECTS AND CHALLENGES

Please the questionnaire is intended for academic purpose only. Kindly be frank in answering the questions as possible. The company's name would not be displayed in the final report. Thank you.

A. BACKGROUND

1. What is the location of your establishment?

a. Accra	[]	b. Tema	[]
c. Kumasi	[]	d. Sekondi/Takoradi	[]
2. How many employees do you have?
3. Which type of industry by sector is your establishment?

a. Food Production/Processing	[]	b. Beverages/Candies	[]
c. Cotton/Textiles	[]	d. Plastic Products	[]
e. Pharmaceutical	[]	f. Other.....	[]
4. Please, what is your position in the establishment?

a. CEO	[]	b. Environmental manager	[]
c. Quality manager	[]	d. Other.....	[]
5. How long have you been employed in this establishment?

a. Less than a year	[]	b. > one but < two years	[]
c. > two but < five	[]	d. > five but < 10	[]
e. > ten	[]	f. Other.....	[]

B. EMS IMPLEMENTATION

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

a. ISO 9000/9002	[]	b. Safety and Management	[]
c. EMAS regulation	[]	d. None	[]
e. Others.....	[]		
7. 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	[]		
8. Have these system(s) been certified? a. Yes [] b. No [] c. Cant Tell []
9. If yes, by which institution?..... []
10. What is the most important rationale for its implementation?

a. International acceptance	[]	b. International trade barriers	[]
c. Facilitates compliance/regulations	[]	d. Pressure from customers	[]
e. Cost Reduction	[]	f. Can't tell	[]
g. Other.....	[]		

11. 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..... | [] |

12. 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

13. How would you rate the success of the standard?
- | | | | | | |
|-----------|-----|--------------|-----|---------------|-----|
| a. Failed | [] | b. Succeeded | [] | c. Can't Tell | [] |
|-----------|-----|--------------|-----|---------------|-----|
14. What are the reasons for failure of the EMS in your company?
- | | | | |
|--------------------------------------|-----|-------------------------------|-----|
| a. Lack of experience | [] | b. Lack of personnel training | [] |
| c. High cost of certification | [] | d. Lack of planning | [] |
| e. Inadequate management involvement | [] | f. Can't tell | [] |
| g. Others..... | [] | | |
15. 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. Advance Planning | [] |
| e. Can't tell | [] | f. Others | [] |
16. What are the benefits you derived or hope to derive from EMS implementation?
- | | |
|---------|--|
| a. | |
| b. | |
17. 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 increases | [] |
| e. Increased | [] | f. Can't tell | [] |
18. If it has decreased, what are the causes?
- | | | | |
|---------------------------|-----|------------------------------------|-----|
| a. Government legislation | [] | b. Inadequate management awareness | [] |
| c. Low market access | [] | d. Inadequate customer awareness | [] |
| e. Can't Tell | [] | f. Other..... | [] |
19. 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..... | [] | | |
20. Has the competence in your company staff in EMS increased since implementation?
- | | | | |
|--------|-----|-------|-----|
| a. Yes | [] | b. No | [] |
|--------|-----|-------|-----|
21. Has the attitude of the staff towards environmental work changed during the process?
- | | | | |
|--------|-----|-------|-----|
| a. Yes | [] | b. No | [] |
|--------|-----|-------|-----|
22. If yes, how?.....
23. If no, why?
24. Did you effect changes in the products after implementation?
- | | | | |
|--------|-----|-------|-----|
| a. Yes | [] | b. No | [] |
|--------|-----|-------|-----|

25. 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

26. 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..... []
27. (Ask if ISO 14001 is not mentioned in Q 7) Have you made any plan to get ISO 14001 for your company?
 a. Yes [] b. No [] c. Can't Tell []
28. 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 []
29. 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..... []
30. 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

31. Has your company taken environmental issues as important in its operation?
 a. Yes [] b. No []
32. Would you say your organization's activity has an impact on the environment?
 a. Yes [] b. No [] c. Can't Tell []
33. Are these impacts positive or negative?
 a. Positive [] b. Negative [] c. Can't tell []
34. What is your level of compliance with local environmental legislation?
 a. 20% [] b. 40% [] c. 60% []
 d. 80% [] e. 100% [] f. Can't tell []
35. Kindly mention two current environmental regulations you know.
 a.
 b.
36. Which environmental regulations have you been complying with?
 a. []
 b. []
37. Kindly give suggestions to improve EMS certification in Ghana
 a..... []
 b..... []

THANK YOU VERY MUCH FOR YOUR SUPPORT