National Profile to Assess the Chemicals Management Infrastructure in Ghana

Towards the Implementation of the Recommendations
of Chapter 19 of Agenda 21 on the
Environmentally Sound Management of Toxic Chemicals

prepared with the assistance of the
United Nations Institute for Training And Research (UNITAR)

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FOREWORD

This document is intended to provide a comprehensive assessment of the national chemicals management infrastructure relating to the legal, institutional, administrative and technical aspects, along with an understanding of the nature and extent of chemicals availability and use.

Issues or priorities of concern raised in the report relate to the entire chemical life cycle and hence affect all sectors of the national economy. It is clear that an integrated approach with the involvement of all including policy makers, government agencies/institutions, non-governmental agencies, the donor community and the general public is necessary for effective chemicals management.

Although chemicals are indispensable in many economic activities, the misuse or failure to follow best practice is costly. Integrated Chemicals Management (ICM) has been recognised globally. Chapter 19 of "Agenda 21" adopted by Heads of States or Governments at the United Nations Conference on the Environment and Development in 1992, agreed on the goal of achieving the sound management of chemicals by the year 2000. The United Nations Institute for Training and Research (UNITAR) and the Inter-Organization Programme for the Sound Management of Chemicals (IOMC) sponsored this National Profile.

The main objective of assisting countries to assess and to strengthen their national capabilities and capacities for management of chemicals is laudable. The preparation of a profile also serves as an effective component of broader national efforts to achieve environmental protection and sustainable industrial, agricultural and economic development. It is therefore important to promote safe management and use of chemicals for industrial, agricultural, public health and consumer uses in order to avoid damage to human health, the ecosystems and the environment in general to ensure sustainable development. The assistance given by the above-mentioned and others who helped with the preparation of the National Profile is highly appreciated.

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We gratefully acknowledge the kind permission given by the Government of Ghana to the Environmental Protection Agency through the Ministry of Environment, Science and Technology to participate in the preparation of National Profile to assess the Chemicals Management Infrastructure for Ghana.

We are enthused by the spontaneous response received from the numerous stakeholders in chemicals management in Ghana such as the Honourable Ministers of State responsible for Environment, Agriculture, Employment and Social Welfare, Trade and Industry, Health, Local Government and Rural Development, who released relevant experienced officers and staff for the task. Further thanks go to the various Universities in Ghana for releasing experienced lecturers with the requisite knowledge in chemicals management for the task.

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INTRODUCTION TO THE NATIONAL PROFILE

Linkages Of The National Profile To The International Policy Framework For The Sound Management Of Chemicals

Ghana took up the challenge and affirmed her determination for taking concrete measures to achieve sustainable environmental protection and economic development following the United Nations Conference on Human Environment held in Stockholm in 1972. In this light, Ghana established the than Environmental Protection Council (EPC) in 1974 to advise Government on all issues pertaining to the Environment and Health.

This advisory body in liaising with UNEP and other United Nations organizations paved the way for the recognition of Ghana by the international community. This move afforded the country the great opportunity for attending numerous international fora for active participation and progress.

Prominent among these international fora on the environment is Ghana's participation in the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in 1992, having played active role in the 'PREPCOM' Meetings preceding the Conference.

At this Conference, Heads of States or Governments adopted "Agenda 21"- a document, which seeks, among other things, to enhance the sound management of chemicals. This document, in the main, outlined responsibilities of every nation towards the collective achievement of sustainable development.

Of particular relevance for chemical management is the chapter 19 of this Agenda 21 which deals with environmentally sound management of chemicals as well as illegal international traffic in toxic and dangerous products.

The are six main programme areas on which governments are expected to base their action and priorities relating to chemicals management. These are:

1. Information exchange on toxic chemicals and chemicals risks;

2. Harmonization of classification and labeling of chemicals;

3. Expanding and accelerating international assessment of chemical risks;

4. Establishment of risk reduction programmes;

5. Prevention of illegal international traffic in toxic and dangerous products;

6 Strengthening national capacities and capabilities for the management of chemicals;

The Rio and Stockholm Conference established the Inter-governmental Forum on Chemical Safety(IFCS) as a means for Government to exchange information on activities

being undertaken to safeguard health and the environment from dangers of chemicals, in spite of benefits that they bring in enhancing the global livelihood.

On the local scene, the task of assessing the existing national capacities and capabilities for sound and sustainable management of chemicals has become urgent as a result of the developments being made for integrated chemical management. This initiative has brought in its wake, the enactment of the Pesticide Control and Management Act 1996,(Act 528) subsequent to an earlier enactment of the Environmental Protection Agency Act, 1994 (Act 490). This concern, fortunately and timely, met with the initiation and implementation of International programmes on sound management of chemicals world wide.

In recognition of the importance of assessing the existing infrastructure for chemicals management in the various countries UNITAR extended an invitation to all countries participating in the workshop on the Sound Management of Chemicals and the Implementation of Prior Informed Consent (PIC) for countries of western and Central Africa held in Accra, Ghana, from 22-26 July, 1996 to apply for assistance in this regard.

Ghana, through EPA, the Designated National Authority (DNA) for PIC responded to the invitation and was accordingly granted this assistance by UNITAR to conduct the profile.

Objectives and Anticipated Benefits of Preparing the National Profile

Objectives:

At the National Planning Meeting held at Novotel Hotel Accra on 2-3 December, 1996 participants agreed that the National Profile was necessary to:

- help identify gaps and weaknesses in the management of chemicals in the country;
- to serve as the basis for strengthening all national institutions with the view to developing capacities and capabilities of all stakeholders of chemicals management;
- provide a comprehensive database on the various types of chemicals in use in the country;
- help formulate procedures for the investigation of social impacts of chemicals applications and thereby: improve knowledge and understanding of potential impacts of chemicals on health and the environment; provide the basis for better health and environmental protection as well as increase the awareness of chemical hazards at all sectors in their production, storage, transportation, and disposal.
- help develop the necessary legal instrument for the control of the importation, exportation, production and use of chemicals.

- provide an instrument to enhance flow/exchange of information on chemicals to all stakeholders.

- provide a document to serve as a basis to strengthen the institutional capabilities for decision making on chemical management.

- enlist or identify chemicals (nature, types, distribution) manufactured, imported/exported, their quantities as well as qualities for the purpose of standardization

- the document will enable the establishment of mechanism for regulating and monitoring chemicals management in the country.

- furthermore the document when completed, is expected to provide the needed information for assessing the strengths and weaknesses of existing national infrastructure (laboratories, storage facilities, and human resources) capabilities necessary for sound management of chemicals, thereby enabling the establishment of mechanism for regulating and monitoring of chemicals in the country.

Benefits:

The meeting identified numerous benefits of the exercise. The most urgent benefits include:

- improvement in the international trade in chemicals.

- enhanced mode of transportation, handling, and application of chemicals.

- broad information base and easy accessibility to all stakeholders in chemicals management.

- a coordinated and integrated system in the management of chemicals among all stakeholders.

- established procedures/guidelines for sound chemicals management.

- a basis for easy identification and assessment of needs of the nation in terms of technical and financial assistance from the international and donor communities.
- citizens will have meaningful education about storage, hazards, dangers etc. involved in the use of chemicals (also be aware of dangers, safety, use storage and disposal of chemicals.

- relevant institutions or organizations will be equipped or strengthened to come out with acceptable quality product standards and code of practice on the safe use of chemicals for various sectors.

- effective monitoring and enforcement of legislation related to management of chemicals in the country.

- improved worker, public relationship and sound environmental protection

Preparation of the National Profile

Through a series of bilateral discussions between the Ministry of Environmental, Science and Technology and the Environmental Protection Agency on one hand and representatives of UNITAR/IOMC, on the other, Financial and Technical Assistance was extended to Ghana to towards the preparation of the National Profile. The Environmental Protection Agency (EPA) was selected to host the secretariat for coordinating the preparation. The National coordinator was selected from the EPA. The following institutions formed the coordinating team:

- Ministry of Environment, Science and Technology

- Chemistry Department of the National Nuclear Research Institute, Kwabenya.

- Plant Protection and Regulatory Services Department of the Ministry of Food and Agriculture, Pokuase.

- Department of Chemistry of the University of Ghana, Legon.

- Factories Inspectorate Department of the Ministry of Employment and Social Welfare.

- Association of Ghana Industries, Accra.

- Ghana Statistical Services.

- Crops Research Institute of the Council for Scientific and Industrial Research, Kumasi.

- Department of Crop Science, Kwame Nkrumah University of Science and Technology, Kumasi.

- Friends of the Earth (an Environmental NGO)

At the National initial Workshop, held between December 2-3, 1996, five working groups were set up for the collection of data and the preparation of specific chapters of the National Profile. All meetings of the working groups were held and coordinated by the National Profile secretariat at the EPA. A number of meetings were held by each working group after the national workshop in December, 1996.

EXECUTIVE SUMMARY OF THE NATIONAL PROFILE

Introduction

In 1985 the then Environmental Protection Council (EPC) initiated a chemical monitoring programme. Under the programme, importers of all types of chemicals, (industrial, agricultural, and commercial/consumer) were obliged by a government directive to obtain a clearance permit from the council before delivery of their consignments at the ports of entry is taken. The implementation of this directive involved other government agencies such as the Ghana Ports and Harbours Authority (GPHA), the Customs, Excise and Prevention Service (CEPS), the Ghana Standards Board and the Ministry of Food and Agriculture.

Though there were no established protocols between the involved agencies, the chemicals monitoring programme has been fairly effective in counseling importers on banned and restricted chemicals into the country.

Nevertheless, in order to improve upon the existing procedure for managing pesticides, the Pesticide Control and Management Act 1996(Act 528) was enacted. With this development, the task for assessing the existing infrastructure for chemicals management became urgent. In this regard the request for assistance made by Ghana to UNITAR/IOMC to sponsor the preparation of National Profile to assess the infrastructure for sound management of the chemicals received the kind attention by UNITAR; hence the preparation of the National Profile.

Objectives and Anticipated Benefits

Ghana's National Profile is expected to assess all existing infrastructure and capacities for managing chemicals properly by strengthening these structures to bring greater benefit to all sectors of the economy. Some of the specific objectives of the profile are:

- to strengthen all national institutions to achieve better chemicals management
- to provide a comprehensive database on all chemicals.
- to enhance efficiency of services of regulatory agencies involved in chemicals management.
- to establish a platform for exchange of information among all stakeholders.
- to improve procedures for decision making on sound chemicals management.
- to identify gaps and weaknesses for correction in order to enhance chemicals management.

The anticipated benefits from the National Profile include the following:

- minimize pollution arising from bad chemicals management practices.
- high level of awareness and education on sound chemicals management.
- establish procedures/guidelines for sound chemicals management.
- comply with international reporting system.
- receive technical and financial assistance from the international community.

Preparation of the National Profile

A National coordinating Team comprising eleven different and autonomous institutions or organizations was established with secretariat at the Environmental Protection Agency in 1996. Members of the team came from cross-section of interest groups, stakeholders, non-governmental organizations (NGOs), professional bodies, universities and research institutions, and industry. Under the auspices of the coordinating team, five working groups were established. These working groups were charged with collecting and compiling data for preparing specific chapters of the national profile.

Background Information

Ghana has a land area of 238,537 square kilometers. The country is bounded on the West by the La Cote d' Ivoire, on the North by Burkina Faso, on the East by the Republic of Togo and on the South by the Atlantic ocean.

Lying on the West Coast of Africa, Ghana's southern coast extends between latitude 4.5^0N at Cape Three Points and 6.5^0N in the extreme east. The country extends about 672 kilometers from the southern coast to the northern edge of the country on latitude 11^0N. The country has a parliamentary democracy with executives powers vested in a president. The population of the country is estimated at 17.5 million as at 1996, with growth rate of 2.83%, and about 32% urbanized structure. The birth rate of Ghana is estimated at 45 births per 1000 population, while the death rate stands at 13 death per 1000 persons. The life expectancy is 55 years.

The official language of the country is English, but there are six major local languages spoken in the country. The major productive sectors of the economy are mining, manufacturing and processing industry, agriculture and services. The contribution of these sectors to the Gross Domestic Product (GDP) is of paramount importance. The major agricultural crops are cocoa, timber maize, rice, millet, cassava, cowpeas and pineapples.

Chemical Production, Import, Export and Use

The main types of chemical imports to Ghana include: Petroleum products, various fertilizer types, Pesticides, Industrial raw materials for processing industries as well as chemicals for the mining industries. The primary sources of these chemicals are Germany, UK, South Africa, USA, Japan, Holland, Belgium, China, South East Asian Countries, Nigeria, and Ivory Coast.

Nearly 20% of the imported chemicals are either formulated or repackaged for sale on the local market. Many of the above-mentioned chemicals find use in the processing/manufacturing industries, petroleum industry and the agricultural industry. Large quantities of mine tailings and inorganic pollutants such as arsenic, mercury, cyanide and oxides of sulphur are generated as waste. No waste however is either imported into or exported out of the country.

Priority Concerns Related To Chemical Production, Import, Export And Use

Many of the industrial and consumer/processing chemical industries in Ghana are located in the southern sector. The Agrochemical industries are evenly distributed all over the country whereas mining activity is concentrated in the forest zones of Ashanti and Western Regions. Liquid effluents are generally discharged into water bodies without pre-treatment. Uncontrolled emission of gases and particulate matter from some industries and vehicles are other sources of concern. Pollution, particularly from industrial sources, is currently being addressed by the Environmental Protection Agency.

In effect, air pollution, solid contamination, pesticide and heavy metal residues in food, occupational health and safety issues, storage and disposal of obsolete chemicals and chemical import control systems are major priority areas of concern related to chemical production, import, export and usage. The Environmental Protection Agency is currently compiling data to regulate the permissible levels of pollutants that can be discharged into water bodies.

Legal Instruments and Non-Regulatory Mechanisms & Ministries, Agencies and Other governmental Institutions Managing Chemicals

Chemicals are an important part of human existence today. They are widely employed in industries like agriculture, mining, manufacturing and in the home. Chemicals, however, pose threats to human health and the environment especially if they are misused. Consequently, there is the need to provide a framework for the management and control, including, inter alia, the use of policy and legislation.

Chapters 4 and 5 deal with Legal Instruments and Non-Regulatory Mechanisms for Managing Chemicals by Ministries, Agencies and Other Institutions responsible for managing Chemicals.

While there is currently no comprehensive legislation dealing with the management of all chemicals, there are numerous laws that deal with various chemicals. A substantial number of these laws relate to agriculture and health sectors with few dealing with petroleum and mining.

The adoption of the Environmental Protection Act, 1994 (Act 490) and the Pesticides Management and Control Act 1996 (Act 528) has filled an important vacuum in Ghana's efforts at chemicals management.

Chapter 5 describes and analyses mandates, programmes and mechanisms which facilitate co-ordination and co-operation among ministries and other relevant governmental and non-governmental bodies in various aspect of chemical management.

Most of the chemicals aforementioned, are managed by specific Ministries and Departments, working independent of each other. While there has been no serious conflict and overlap, these could occur. Gaps also exist in respect of chemicals other than pesticides, mercury and petroleum.

While there are plans to introduce incentives and disincentives as chemical management tools, no records currently exist on the use of voluntary and other non-regulatory mechanisms for this purpose.

Enforcement remains a major problem due to inadequate skilled personnel; lack of appropriate equipment and outdated penalty provisions.

Ministerial and Departmental mandates for managing chemicals are widely dispersed and quite often industry specific interagency and institutional co-operation must be strengthened if efficiency, effectiveness and the optimum use of resources is to be achieved.

Under comments and analysis a summary is given of what measures could be pursued to address the problems identified in the review and analysis of the policy and legislative issues relating to the environmentally sound management of chemicals.

Relevant Activities Outside of Government

There exist some identifiable groups in the country that complement Governments efforts in the management of chemicals. These groups are either non-governmental organizations or quasi-governmental. The performance of most of these institutions has been satisfactory though most of them lack the needed legal mandate in enforcing regulations that go with sound chemicals management.

Inter-Ministerial Commissions and Co-ordinating Mechanisms

To effectively manage chemicals requires a concerted effort, both from the private and government institutions. This has resulted in the setting up of cross-sectoral networks not backed by legislation mandates.

Data Access and Use

Available data needed for integrated chemicals management is scattered throughout the various ministries, organizations, institutions and companies which are directly involved. No regular systems to integrate such data exist, moreover, methods of collecting and collating existing data is mainly manual. Enough data on issues such as chemical accidents, levels of production, and use are lacking.

The Environmental Protection Agency regulates and monitors all imports, distribution and use of all forms of industrial and agricultural chemicals in the country, and is currently preparing a database for that purpose.

International literature that are accessible in the country include scientific journals and technical papers of various UN agencies. With the appropriate computerized network in place, vital information for sound chemicals management could be assessed easily.

Technical Infrastructure

The major infrastructure (laboratories and computer facilities) with capacity to undertake chemical analysis for various substances can be located in Government Institutions (Research, Universities, industries) which are mainly set up to perform specific functions (e. g. control of quality of locally manufactured foods and drugs, as well as formulation control analyses of pesticides). Most of the existing laboratories are neither accredited nor certified for Good Laboratory Practice (GLP).

Both government and the private sector have computer systems and documentation within the framework of projects, specific to their areas of sectoral competence. There is however, the need for frequent training and educational programmes for technical personnel to enhance the sound management of chemicals.

International Linkages

Ghana has in the past participated in meetings of United Nations such as the United Nations Conference on Human Environment held in Stockholm in 1972, the United Nations Conference on Environment and Development (UNCED) held in Rio de Janerio in 1992.

Ghana plays an active role in the on-going negotiation for the preparation of legally binding instrument on PIC (UNEP and FAO Joint Programme). A number of conventions have already been signed and ratified including the Vienna Convention on the Protection of the ozone layer, Montreal Protocol on the substances that deplete the

ozone layer, Basel Conventions on the control of Trans-boundary Movement of Hazardous Waste; Biological Diversity; and the UN Framework Convention on Climate Change.

Awareness/Understanding of Workers and the Public

Public apathy over proper handling, marketing and disposal of chemicals in the environment is an indication of the low level education in matters concerning chemicals in the country. There is therefore the need to inform and sensitise the general public through all possible avenues, especially through the print and electronic media taking advantage of the existing 15 adopted local languages in the country. Workshops, seminars and meetings organised at the community level are other channels of information dissemination.

Resources Available And Needed For Chemicals Management

Capacities in terms of qualified human resource and finance are necessary ingredients towards the achievement of effective and sound management of chemicals in the country. The current annual budgetary allocations in this direction are woefully inadequate. In particular adequate financial resources are needed for:

1. Making instrumental service and spare-parts available to quality control laboratories

2. Training of personnel in various aspects of chemicals management and

3. Strengthening chemical imports and control as well as the legislation enforcement.

Conclusions and Recommendations for Follow-up

The establishment of the Environmental Protection Agency (EPA) as a key governmental agency for management, conservation and protection of the environment using the multi-stakeholder approach is a laudable policy by government. In this way, the mission of EPA of Ghana is to co-manage, protect and enhance the country's environment and also seek common solutions to global environmental protection using integrated approach.

Development of chemicals management programmes has been hinged on this integrated mutistakeholder approach.

For this reason further consideration of efforts and actions as envisaged in the process of preparing the National Profile to assess infrastructure on chemicals management has helped to focus this mission for the future.
The collection and collating of data for the National Profile has been quite strenuous and tedious but very fruitful. It has brought to the fore-front emerging problems of chemical management. The weakness of the supposed existing infrastructure for chemicals management has been made bare for immediate attention and strengthening.

The key areas earmarked for immediate follow-up in order to streamline and strengthen chemicals management capacity and capabilities include:

i. improvement in capacity to collect, collate and disseminate information on chemicals management to facilitate making informed decisions with regard to chemicals management;

ii. establishment of an Integrated Chemicals Management Information Systems (ICMIS);

iii. intensification of programmes on education, awareness raising and training;

iv. enhancement in monitoring capacity, hazard and risk assessment, interpretation and communication;

v. increase in capacity for implementing and enforcement and compliance in chemicals management;

vi. strengthening of technical infrastructure of laboratory, capacity of NGOs and training institutes;

vii. research and development into environmentally friendly alternative chemicals at the local level;

viii. adoption of suitable strategy for pollution prevention and waste minimization;

ix. adoption of risk management policy, including evaluation of safer chemical alternatives and non-chemical options;

x. strengthening of legislation to ensure the availability of safe and effective chemicals for use at all times;

CHAPTER 1: NATIONAL BACKGROUND INFORMATION

1.1 PHYSICAL AND DEMOGRAPHIC CONTEXT.

The Republic of Ghana has a land area of 238,537 square kilometers. The country is bounded on the west, by La Côte d'Ivoire, on the north, by Burkina Faso, on the east, by the Republic of Togo and on the south, by the Atlantic ocean.

The country lies on the West African Coast. Its southern coast extends between latitude 4.5^{o}N at Cape Three Points and 6.5^{O}N in the extreme east. From the Coast, the country extends inland to about latitude 11^{0}N covering a distance of 672km. The distance across the widest part from east to west measures 536 km.

Form of Government

Ghana is governed under a Republican multi-party constitutional democracy with executive power vested in the President while legislative power rests with a unicameral legislature of 200 members serving a four year term at the national level. In addition, the country operates a local government system comprising Regional Coordinating Councils, Metropolitan, Municipal and District Assemblies.

Official Language

English is the official language.

Local language(s)

The main local languages spoken and used on broadcasting media are Akan, Dagbani, Hausa, Nzema, Ewe and Ga. (see map of Ghanaian Languages Annex 2).

Ethnic groups and Location

The Ghanaian population is made up of many ethnic groups. The largest, the Akans, account for 44% of the population. Other major ethnic groups are the Mole-Dagbani (16%), Ewes (13%), Ga-Adangbe (8%), Gruma (4%) and Grussi (2%); a number of smaller ethnic groups make up the remainder (See map of Ghanaian Languages Annex 2).

Religion

Evidence from the third Ghana Living Standards Survey (GLSS-3) indicates that nearly two-thirds (64%) of the heads of household are Christians, 14% are Muslims, 18% are practitioners of traditional religion or animists and 4% are adherents of various smaller religious entities.

Total Population

The country has so far conducted three post independence national censuses in 1960, 1970 and1984. The population of Ghana which totaled 6.7 million in 1960, increased to 8.6 million in 1970 and 12.3 million in 1984 and estimated at 17.5 million in 1996. The rate of the country's population growth is estimated to lie within the 2.8-3.0 percent range per annum.

Urban and Rural Population

The official definition of an urban area is a locality with at least 5000 persons whilst a rural area is a locality with a population size of less than 5000 persons. Based on this definition the level of urbanization has been rising gradually from 23% in 1960 to 28.9% in 1970 and 32% in 1984 as indicated in the summary table below. About two-thirds of Ghana's population live in rural areas.

Table 1: Urban and Rural Population

	Population		**Percentage Distribution**			
Year	Urban	Rural	**Total**	Urban	Rural	**Total**
1960	1,551,360	5,175,455	**6,726,815**	23.1	76.9	**100.0**
1970	2,472,456	6,086,857	**8,559,313**	28.9	71.1	**100.0**
1984	3,934,796	8,361,285	**12,296,081**	32.0	68.0	**100.0**

Source: Ghana Statistical Services.

At present just under one third of Ghana's population reside in urban areas, but over half of these are concentrated in the conurbations of Accra, Kumasi, Sekondi-Takoradi and Tamale. The Urban population is estimated at 5.3 million at present and the rate of urban growth is estimated at 4.1%.

Birth rate

The country's birth rate is currently estimated at 45 births per 1000 population and the estimated death rate now stands at 13 deaths per 1000 population.

Life Expectancy

The life expectancy is 55 years.

Literacy

Adult literacy is estimated at 53% of the adult population (15 years and above) but varies considerably between men and women, their respective rates being 64% and 42%.

Unemployment rate

In all the three rounds of the Ghana Living Standards Surveys (GLSS), the unemployed are defined as all persons who do not have employment, but were actively looking for work for pay or profit.

There are various estimates of the rate of unemployment in Ghana ranging from 10% to 30% depending on the definition, methodology and the data used. The working unemployment rate adopted in the national employment policy framework Report (March, 1996) prepared by the Ministry of Employment and Social Welfare is estimated at 20%. This implies that about 1.9 million people are either under or unemployed.

The last round of the Ghana Living Standards Survey (GLSS 3: 1992) estimates unemployment at a remarkably low rate of 3.4%. This rate is however considered the hard-core unemployed and excludes the under-employed population.

Population Policy

The first national population policy for Ghana was launched in 1969 and after nearly three decades of implementation has been revised under the Fourth Republic after some stock taking. In general the revised policy seeks to:

- ensure systematic integration of population and family planning issues in all aspects of development planning and programming,
- provide information and education on the value of a small family size and responsible parenthood,
- provide accessibility to, and ensure affordability of, family planning services for all couples and individuals desirous of regulating their fertility,
- reduce further the high rates of morbidity and mortality and promote the health and welfare of mothers and children,
- improve demographic data collection, processing, analysis, dissemination and research on population and development on a regular basis,
- achieve a more balanced distribution of the population between rural and urban areas as well as between regions,
- promote sound environmental management, and

- address the needs of women, the youth, the aged, persons with disabilities and other vulnerable groups so as to enhance their full integration into all aspects of national life.

The National Population Council (NPC) Act was passed by Parliament in December, 1994. Its function is to advise the Government of Ghana on population issues. The mandate of the NPC also includes coordinating monitoring and evaluating all population programmes and activities in the country; ensuring the effective implementation of the revised population policy and integrating a comprehensive population programme into the overall development plan.

Median age of the Population

The results of the 1984 national population census and three major national household surveys, between 1988 and 1993 (Table 2) show that Ghana's population has a young age structure with 48.2% of the population being less than 15 years old in 1993 and only 3.6% being 65 years or more in the same year. Persistently high fertility levels among the population and over three decades of declining mortality have resulted in a rapidly growing population with a median age of only 16 years.

Table 2 The de facto population by age from other sources

Percent distribution of the population by age group at different dates, Ghana				
Age group	1984 Census	1988 GDHS	1991/92 GLSS-3	1993 GDHS
Less than 15	45.0	48.4	46.9	48.2
15-64	51.0	47.8	49.2	48.2
65+	4.0	3.8	3.9	3.6
Total	100.0	100.0	100.0	100.0
Median age	17.5	15.7	16.0	16.0

Source: GDHS, 1993

1.2 POLITICAL/GEOGRAPHIC STRUCTURE OF THE COUNTRY

Ghana has ten administrative regions (see Annex 1), which are further divided into 110 districts, which form the basic units of political administration.

1.2.1 DESCRIPTION OF LOCAL GOVERNMENT ENTITIES/ADMINISTRATION

Structure Of The Local Government System

The Local Government system is made up of a Regional Coordinating Council, Metropolitan, Municipal/District Assemblies.

The Metropolitan Assembly has a four-tier structure consisting of the Metropolitan Assembly, Sub-metropolitan Councils, town councils and unit committees.

The Municipal and District Assemblies have a three-tier structure as indicated below.

The Municipal Assembly is made up of the Municipal Assembly, zonal councils and unit committees.

The District Assembly is made up of the District Assembly, Urban/Town/Area Councils and Unit committees.

1.2.2 COMPOSITION OF THE LOCAL GOVERNMENT STRUCTURES

Regional Coordinating Councils (RCCs)

RCCs are established for each of the 10 administrative regions of Ghana. The Regional Coordinating Council is an administrative and coordinating rather than a political and policy making body. The Regional Coordinating Council (RCC) consists of the Regional Minister as Chairman and his Deputy or Deputies, the Presiding Member of each District Assembly and the District Chief Executive of each district in the region, two chiefs from the Regional House of Chiefs and the regional heads of the decentralized ministries, departments/services. These regional heads exercise no voting rights during meetings of the RCC.

The District Assembly consists of the District Chief Executive, two-thirds of the members directly elected by universal adult suffrage, the member(s) of parliament MP or MPs representing constituencies within the district, and one-third of the members appointed by the President in consultation with chiefs and interest groups in the district.

Metropolitan/Municipal/District Assemblies

District Assemblies in Ghana are either Metropolitan (population over 250,000), Municipal (one-town Assemblies with population over 95,000) or District (population 75,000 and over). There are three (3) Metropolitan Assemblies, four (4) Municipal Assemblies and one hundred and three (103) District Assemblies.

The District Chief Executive is nominated by the President, approved by two-thirds of the members of the District Assembly present and voting, and appointed by the President.

The Assembly has a Presiding Member who is elected from among its members by two-thirds of all the members of the Assembly.

The Sub-Metropolitan District Councils consist of not less than twenty-five and not more than thirty members, made up of all elected members of the Assembly in that Sub-Metropolitan District and such other persons resident in the Sub-Metropolitan District appointed by the President.

The Urban Council consists of not less than twenty-five and not more than thirty members made up of not more than eight persons elected from among the members of the relevant District Assembly, not more than twelve representatives from the Unit Committees in the area of authority of the Urban Council and not more than ten person ordinarily resident in the urban area.

The Zonal Council consists of not less than fifteen and not more than twenty members made up of not more than five persons elected from among the members of the relevant Municipal Assembly, not more than ten representatives from the Unit Committees and not more than five persons ordinarily resident in the zone.

The Town/Area Councils consist of not less than fifteen and not more than twenty members made up of not more than five persons elected from among the members of the relevant Assembly, not more than ten representatives from the Unit Committees and not more than five persons ordinarily resident in the town or area.

The Unit Committee consists of not more than fifteen persons made up of ten elected persons ordinarily resident in the unit and not more than five other persons resident in the unit and nominated by the District Chief Executive, acting on behalf of the President.

Elections to all local government bodies are on a non-partisan basis; the elections are state-sponsored and conducted by the Electoral Commission.

1.2.3 OFFICE OF THE DISTRICT ASSEMBLY (ODA)

The ODA replaces what used to be called the District Administration. The Office has the following features:

(a) It is headed by a District Coordinating Director,

(b) All the Civil Service Departments in the district whose functions are decentralized, are constituted into Departments of the District Assembly;

(c) The Departments are to implement decisions of the District and provide quarterly reports to the Executive Committee through the Office of the District Assembly;

(d) It is to establish:

(i) An Appointments and Promotions Committee;

(ii) A Disciplinary Committee.

The Office has the following functions -

a. implementation of policies and decisions of the District Assembly;

b. effective budgeting;

c. observance of financial, stores and budgetary rules and guidelines; and

d. initiation, execution, monitoring and evaluation of development plans, projects and programmes.

1.3 PERFORMANCE OF THE AGRICULTURAL SECTOR

Agricultural output grew a little under 14% in 1984, accelerated by good rainfall and improved input supplies, and accounted for about 55% of GDP. A further growth of 5.3% was recorded in 1986 and 6.0% in 1988 after a slight decline in 1987 due to drought and another 6% in 1989. The realignment of the local currency the cedis, vis a vis other convertible currencies and the subsequent increases in agricultural output prices have had an enormously, favourable impact on the comparative advantage of Ghanaian agriculture including export and food crops as well as import-substituting crops. In 1988 for example, 65 different non-traditional agricultural commodities valued at $27,000,000 were exported. Non traditional agricultural commodity exports represented 64% of the total non-traditional exports for that year, and self-sufficiency ratio for maize, rice, sorghum and millet reached an all time high of 77% in 1988 from a low of 35% in 1983.

Furthermore, the $27,000,000 earned in 1988 from non-traditional agricultural exports represented 44% increase over the 1987 earnings.

Among the successes that have been achieved in the agricultural sector since the implementation of the Medium Term Agricultural Development Programme (MTADP) in 1991 include:

- increase in the export of non-traditional agricultural commodities;
- complete privatization of the supply and the distribution of agricultural inputs which previously were the responsibility of the MOFA and COCOBOD; and
- improvement in agricultural extension services.

The country's Medium Term Agricultural Development Programme (MTADP) which sets out priorities in the agricultural sector was initiated in 1988 to consolidate the gains made under the Economic Recovery Programme (ERP) - 1983-1988). The programme being a rolling 5-10 year development plan was designed to set priorities in the

agricultural sector and to identify key policy and institutional reforms on a continuous basis.

The MTADP has so far provided a framework for more efficient allocation of public and private sector resources. It has also provided a focus for policy and institutional reform in the agricultural sector in order to fully realize Ghana's agricultural potential.

The agricultural sector is dominated by small holder farmers who use rather rudimentary technology to produce about 80 percent of the total agricultural production on family operated farms. Industrial crops, such as oil palm, rubber, and pineapples are produced on large corporate-managed estates although small holders also produce significant shares of these crops, especially oil palm. Over 60% of the 1.9 million farm holders in 1994 cultivated under 1.2 hectares, another 25% cultivated between 1.2 and 2.0 hectares while the remaining 15% had holdings over 2.0 hectares. On average 62% of the holders were males while the remaining 38% were females.

In general, increases in production have been achieved primarily by farmers using more extensive farming methods in production through the application of improved technology (seeds and fertilizers etc.) Fertilizer usage average only 6 kg/ha with a wide variation across crops. Out of a total land area of 23,853,900 hectares, 13,628,179 hectares representing 57% of the total land area of Ghana is suitable for agricultural production. Total area under cultivation in 1994 was 5,300,000 hectares, representing 39% of the total area suitable for cultivation. Total area under irrigation in 1995 was 10,000 hectares while the area under inland waters is 1,100,000 hectares.

1.3.1 LAND USE, VEGETATION, SOILS AND CLIMATE

Tables 3, 4, 5 and 6 provide details of Land use (Agriculture), Land use (General), Land area by Region, Size of holdings and Vegetational zones.

Table 3: Land Use (Specific To Agriculture)

	Hectares	**%**
Total Land Area (T. L. A.)	23,853,900	100.0
Agric. Land Area (A. L. A.)	13,628,179	57.1
Area under cultivation (1994)	5,300,000	22.2
Total area under irrigation	10,500	0.04
Area under inland waters	1,100,000	4.6
Other	9,125,721	38.3

Source : Medium Term Agriculture Development Programme (MTADP) Document 1991, Ministry of Agriculture, Accra.

Note: percentage will not add up to 100.

Table 4: Land Use (General)

Land use	Area (000 sq. km.)	% of Total
Savannah woodland	71	30
Bush fallow and other uses	60	25
Unimproved pasture	36	15
Forest reserves	26	11
Tree crops	17	7
Annual crops	12	5
Wildlife reserves	12	5
Unreserved forest		2
Total	**239**	**100**

Source : Medium Term Agriculture Development Programme (MTADP) Document, Ministry of Agriculture, Accra

Table 5: Land Area By Region

Region	Area (1000 sq. km.)	% of Total
Northern	70.38	29.5
Brong Ahafo	39.56	16.6
Ashanti	24.39	10.2
Western	23.92	10.0
Volta	20.57	8.6
Eastern	19.32	8.1
Upper West	18.48	7.8
Central	9.83	4.1
Upper East	8.84	3.7
Greater Accra	3.24	1.4
Total	**238.53**	**100.0**

Table 6: % Distribution Of Size Of Holdings By Region

	Size of Holding (hectares)		
Region	**Less than 1.2 ha.**	**12. - 2 ha.**	**More than 2 ha.**
Volta	82	12	6
Eastern	77	15	7
Ashanti	72	22	6
Central	71	18	11
Great Accra	69	17	14
Brong Ahafo	55	32	13
Western	52	32	16
Upper East	48	32	20
Northern	19	43	38
Upper West	16	42	42
	60	25	15

Source : Medium Term Agriculture Development Programme (MTADP) Document, Ministry of Agriculture, Accra

Table7: Vegetation

Vegetation Zone	Area ('000sq. km.)	%
Guinea Savannah woodland	147.9	62.0
Deciduous forest Celtis -Triplochiton Association. Antiaris chloroform Association.	 37.3 27.0	 15.6 11.3
Rain/Deciduous forest ecotone	8.4	3.5
Rain forest	7.5	3.2
Thicket and Grassland	4.5	1.9
Sudan Savannah woodland	1.9	0.8
Swamp and Lagoon Vegetation	1.3	0.6
Others	2.7	0.1
Total	**238.53**	**100.0**

Source : Medium Term Agriculture Development Programme (MTADP) Document, 1991, Ministry of Agriculture, Accra

Soils

The soils have predominantly light textured surface horizons wth sandy loams and slightly heavier textures varying from coarse sandy loams to clays. Heavier textured soils occur in many valley bottoms and in parts of the Accra Plains. Many soils contain abundant coarse material of either gravel and stone, or concretionary materials which adversely affect their physical properties particularly their water holding capacity.

Farming Systems

Agriculture is predominantly on a small holder basis in Ghana, although there are some large farms and plantations particularly for cocoa, rubber, oil palm and coconut and to a lesser extent, rice, maize and pineapples. Main system of farming is traditional with the use of hoe and cutlass. While there is little mechanized farming, bullock farming is increasingly practiced, especially in the Northern Regions of the country.

Table 8: NUMBER OF HOLDERS BY REGION FOR 1990, 1992 AND 1994

Region	No. of holders ('000)			% of Total 1994
	1990	1992	1994	
Ashanti	342.4	352.7	363.3	19
Volta	161.1	165.8	170.8	9
Bring Ahafo	197.0	202.9	209.0	11
Eastern	275.7	284.0	292.5	15
Central	183.7	189.2	194.9	10
Western	155.6	160.3	165.1	9
Northern	115.8	119.3	122.9	6
Upper East	75.3	77.6	79.9	4
Greater Accra	67.3	69.3	71.4	4
Upper West	219.4	226.0	232.8	13
Total	**1,793.3**	**1,847.1**	**1 ,902.6**	**100**

Source : Medium Term Agriculture Development Programme (MTADP) Document, Ministry of Agriculture, Accra

1.3.2 AGRICULTURAL OUTPUT

Crop Sub-Sector

Principal Agricultural Produce

Tree Crops	:	Cocoa, Oil Palm, Coconuts, Coffee
Industrial Crops	:	Cotton, Tobacco, Kenaf
Roots & Tubers	:	Cassava, Cocoyam, Yam
Cereals		:Maize, Rice, Millet, Sorghum
Fruits & Vegetables	:	Pineapples, citrus, tomatoes, banana and other vegetables
Legumes	:	Groundnuts, Cowpeas, Soya beans
Others	:	Plantain

Table 9:Production Growth Rates of Selected Food Crops (1977-1979) To (1987-1989)

Crop	Average Production ('000Mt.) 1977-1979	1987-1989	Growth Rate (%)
1. Roots & Tubers			4.55 (Average)
Cassava	2257.7	2946.8	2.69
Cocoyam	670.6	1063.3	4.72
Yam	521.5	956.4	6.25
2. Plantain	820.7	1104.51	3.01
3. Cereals			4.44 (Average)
Maize	296.7	699.1	8.95
Rice	62.2	79.5	2.48
Millet	133.6	181.8	3.13
Sorghum	145.7	199.5	3.19
4. Legumes			8.22 (Average)
Groundnuts	85.3	206.8	9.26
Cowpeas	8.6	7.2	7.18
	Average Growth Rate = 5.06%		

Source : Medium Term Agriculture Development Programme (MTADP) Document, Ministry of Agriculture, Accra

Table 10: Production Growth Rates of Selected Food Crops (1987-1989) to (1992-1994)

Crop	Average Production ('000Mt.) 1987 - 1989	1992 - 1994	Growth Rate (%)
1. Roots & Tubers			11.96(Average)
Cassava	2946.8	5886.5	14.84
Cocoyam	1063.3	1195.1	2.36
Yam	956.4	2250.6	18.67
2. Plantain	1104.5	1292.7	3.20
3. Cereals			6.35(Average)
Maize	699.1	877.1	4.64
Rice	79.5	150.4	13.59
Millet	181.8	166.4	1.78
Sorghum	199.5	303.6	8.76
	Average	**Growth Rate =**	**7.16%**

Source : Medium Term Agriculture Development Programme (MTADP) Document, Ministry of Agriculture, Accra

Table 11: Yield of Selected Food crops average for (1991-1994)

Crop	Yield (Mt/Ha.)	Achievable Yield (Mt/Ha)*
Cassava	11.0	28.0
Plantain	7.4	10.0
Yam	11.5	20.0
Cocoyam	6.5	8.0
Maize	1.4	5.0
Rice (Paddy)	1.8	3.0
Cowpeas	-	2.0
Millet	1.0	2.0
Sorghum	1.0	2.0

Source : Medium Term Agriculture Development Programme (MTADP) Document, Ministry of Agriculture, Accra

*Indicates yields that have been achieved in isolated cases due to more effective extension and other logistic support.

Table 12: Estimated Levels of Per Capita Consumption of Selected Food Crops

Commodity	kg/head/Year			
	1980	1985	1990	1995
1. Roots & Tubers	145.2	146.2 43.8	146.0 43.3	148.0 42.8
Yam	44.2	-	54.0	55.0
Cocoyam	-	-		
2. Plantain	82.2	82.5	83.0	83.5
3. Cereals	84.8	85.4	88.2	91.1
Maize	38.4	39.2	40.3	41.4
Rice	12.4	12.0	13.3	13.9
Millet	17.0	17.1	17.3	17.4
Sorghum	17.0	17.1	17.3	17.4
4. Pulses & Nuts	22.4	22.5	22.6	22.7
Groundnuts	21.5	21.7	21.7	21.8
Cowpeas	0.9	0.9	0.9	0.9

Source : Medium Term Agriculture Development Programme (MTADP) Document, Ministry of Agriculture, Accra

Agriculture And The National Economy

Table 13: Contribution of various crops to Agricultural GDP (1987)

Sub-sector	Contribution to Agriculture GDP
1. Crops (Total)	64
-Roots and Tubers	46
-Plantain	9
-Cereals	7
-Others	2
2. Cocoa	13
3. Forestry	11
4. Livestock/Poultry	7
5. Fisheries	5

Source: Dapaah (1993).

Table 14: Regional Per Capita Agricultural Income and Projected Growth

Rates for Crop Sub-sector (GDP Per Capita in US$ of 1987 Prices)

Region	1987	Rank	1994	Rank	2000	Rank	Growth
Brong Ahafo	628	1	820	1	882	1	3.88
Ashanti	426	2	562	2	612	1	4.05
Northern	391	3	491	3	506	4	4.05
Western	347	4	486	4	555	3	4.92
Eastern	256	5	355	5	369	5	4.08
Central	226	6	295	6	346	6	4.57
Greater Accra	182	7	251	7	283	7	4.70
Upper West	168	8	212	8	223	8	3.41
Volta	136	9	176	9	188	9	3.75
Upper East	76	10	100	10	109	10	4.07
All	284		375		407		4.22

Source: MTADP Document, Ministry of Agriculture, Accra

Table 1A: Overview of the Industrial and Agricultural Sectors (1993)

Sector	Contribution to the Gross Domestic Product (%)	Number of Employees	Major Products in each Sector
Industrial/Manufacturing Sector[1]	9.6	78656	Wheat flour, Milk, brick tiles, Sugar, cooking oil, Beer, cloth, soap, cement, petroleum products, paper and wood products etc.
Mining and Extraction	1.8	20,500	Gold, Diamond, Manganese, Bauxite
Agricultural sector	45.0	Not Available	Cereals, Starch staples, Cocoa
Total	**58.4**	**99,156**	

Source: Ministry of Trade and Industry.

[1] This would include all manufacturing, production, formulation, assembly and related facilities.

Table 1B: Structure of the Manufacturing/Agricultural Sector

	Micro Farms/ Facilities[1] (%)	Small Farms/ Facilities[2] (%)	Medium Farms Faciliteis[3] (%)	Big Farms/ Facilities[4] (%)
Industrial/Manfac-turing Sector	Not Available	69.6	15.3	15.12
Agricultural Sector	Not Available	Not Available	Not Available	Not Available
TOTAL		**69.6**	**15.3**	**15.12**

[1] 1 to 15 employees;

[2] 16 to 100 employees;

[3] 101 to 250 employees;

[4] More than 251 employees

Table 1C: Breakdown of Agricultural Production National (1994)

Region	Major Crops	Total value of Crop Billion Cedis	Total Number of employees	Size of Productive Areas (# hectares) 1000
	Cocoa Maize	134,548.4 100,812.9	Not Available	797.2 544.7
	Rice	45,218.1	Not Available	117.9
	Cassava	229,083.8	Not Available	Not Available
	Yam Plantain	260,923.0 288,907.8	Not Available	Not Available
	Palm oil Beans	25,421.4 26,273.8	Not Available	590.3 277.4
TOTAL		**1,111,189.2**		**2,327.5**

Source: Ministry of Agriculture

Table 1 D: Breakdown of Industrial Production by Region (1994)

Region	Major Products	Total Value of Production	Number of Industrial Facilities *	Number of Employees
Western	Not Available	Not Available	27	11054
Central	Not Available	Not Available	6	36409
Greater Accra	Not Available	Not Available	59	1920
Volta	Not Available	Not Available	3	3644
Eastern	Not Available	Not Available	9	12208
Ashanti	Not Available	Not Available	47	Not Available
Brong Ahafo	Not Available	Not Available	5	4271
TOTAL			**156**	**69506**

Source: Ministry of Trade and Industry
*Companies employing 50 and above.

1.4 THE PERFORMANCE OF THE INDUSTRIAL SECTOR

Overall, the sector achieved an average growth rate over the past decade of 7.4% pa. Mining recovered rapidly and was able to attract considerable foreign investment. In the past six years a number of new mines have been opened and the sub-sector achieved a growth rate of over 10%. The performance of the manufacturing sub-sector has been disappointing, with output growing only at an average of 0.3% per annum over the past six years.

Table: 1E Some indicators of Manufacturing Activity Classified By Industry Medium/Large Scale Industry) 1995

Industry	No. of Establishment	Total No. of Employees	Gross Out put By The Industrial Sector (10^6 Cedis)	Value Added At Market prices (10^6 Cedis)	Major Emission and Type
Food	43	7,390	94,647.8	33,169.1	Process effluents
Beverages	27	3,367	63,254.3	36.167.0	
Tobacco	3	1,060	80,467.3	71,474.7	
Textile Garment leather	43	10,631	63,417.3	20,302.2	Process effluent
Wood, Cork Products and Furniture Excl Metal	110	24,614	112,667	63,575.8	Dust Spraying Fumes
Chemicals Excl Plastics, Rubber, Petroleum Products	49	4,902	108,075.2	38,402.5	Fumes Gases (SOx, NOx, CO, CO_2)
Petroleum Refinery and Petroleum Products	2	399	61,918.5	32,143.5	
Rubber	6	2,735	3,999.5	2,235.8	
Plastics	31	2,904	28,187.7	10,177.1	
Paper, Paper Products, Printing	61	5,795	31,996.5	12,539.1	Process effluent
Metals	60	7,924	158,202.1	49,603.8	
Non Metallic Minerals	30	3,282	57,396.9	17,512.2	Fugitives, Dust and Fumes
Mining	14	20,500	over \$612 x 10^{6*}		SO_2, CO, CO_2, Dust
Electricals/ Electronics	18	1,096	14,986.9	6,025.3	
Vehicle/Trans-port Assembly	17	1,827	11,340.1	2,525.2	
TOTAL	**500**	**77,926**	**890,557.0**	**395,853.3**	

SOURCE: Ministry of Trade and Industry (1995);* Minerals Commission(1995)
Exchange Rate: US \$1.00 = ¢649.06 (1993)

CHAPTER 2 : CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

2.1 CHEMICAL PRODUCTION, IMPORT AND EXPORT

A national statistical survey carried out revealed that the bulk of all chemicals used in the country is imported. The survey also shows that there are gaps and inadequacies in the data so far collected. Apart from the established importers of chemicals, small or individual dealers may also hold stocks which invariably get on to the market. There are also no available figures on value in cedis for certain categories of chemicals imported into the country during the period under consideration. The main types of chemicals imported are:

a) petroleum products (crude oil, base lubricating oil etc.),

b) various fertilizer types,

c) pesticides (insecticides, fungicides, herbicides etc.)

d) industrial raw materials for the processing industries (e.g. clinker, plastics, solvents, acids, dyes and pigments and commercial chemicals example aluminium sulphate and compounds for water purification etc.)

e) chemicals for mineral ore processing

The primary chemicals exporting countries are :Germany, UK, France, Canada, India, South Africa, Japan, Holland, Belgium, China, South East Asian Countries, USA, Nigeria and La Côte d'Ivoire.

Chemical production in the country constitutes only about 3% of the total chemicals demand. This is made up of mainly glycerol, a by-product of soap manufacturing industry. Glycerol is about the only industrial chemical that is produced and exported by Ghana. The bulk of the total exports of chemicals are basically those which have been formulated and repacked. The main destinations of export are Germany, UK, Holland, Japan, Nigeria, Benin, Burkina Faso. Table 2A shows the break-down of an estimated average of the chemical production and trade in the country for 1994 and 1995

Table 2A: Chemical Production And Trade

Chemical type	Production/Manufacturing (tonnes/value in million cedis)		Importation(tonnes/value in million cedis)		Exports (tonnes/yr.)		Formulation/ packaging (tonnes/yr)
	1994	1995	1994	1995	1994	1995	1995
Pesticide (Agricultural, Public Health, and Consumer use)	N/A	N/A	2,446.9/ 69024	2,689.8/ 99170	N/A	N/A	661.4
Fertilizers	N/A	N/A	2,450/ 1245.5	2,579.5/ 1311.3	N/A	N/A	23.98
Industrial (used in manufacturing/ Processing facilities)	18900	20,000	523,445	619,443.7	18900	20,000	847,499.4
Petroleum Products	N/A	N/A	7245.3	8,318.0	N/A	N/A	1,675.0
Consumer chemicals	85,000	100,000	3,724,812/ 18225.4	4,461,516/ 37314.5	62,500	80,000	552.0
Other chemicals (unknown/ mixed chemicals use).	20,000	24,000	N/A	N/A	18,500	24,000	
TOTAL	**123,900**	**144,000.0**	**4,260,399.2/ 88,494.9**	**5,094,547.0/ 137,795.8**	**99,900**	**124,000.0**	**850,411.78**

Sources: Corporate bodies, Ministry of Trade, EPA, PPRSD.
P/S: N/A = Not Available

2.2 CHEMICAL USE BY CATEGORIES

Majority of the chemicals are applied in agriculture (fertilizers and pesticides), the processing/manufacturing industries (mining, cement, metal, soap, textile etc.) and the petroleum industry (oil refinery and lubricants). Only a small percentage goes into research/educational/medical establishments. Table 2B below indicates estimated averages for 1994 and 1995 since real figures are not available at the time of the survey.

Table 2B Chemical use by Categories

Chemical type	Number of Tonnes Used in the Country per Year
Fertilizers	3,564.4
Petroleum Products	371.2
Industrial Chemicals (used in manufacturing/ processing facilities)	553,060.8
Other chemicals (unknown/mixed use)	4.6
TOTAL	559,681.8

2.3 CHEMICAL WASTE GENERATION

Ghana is generally known to generate huge quantities of mine tailings, though real figures are non existing. Considerable amounts of inorganic compounds of especially arsenic (As) and mercury (Hg), cyanide (CN) and oxides of sulphur (SOx) are generated. The other processing/manufacturing and petroleum industries do generate sizeable amounts of wastes.. No waste material is either imported into or exported out of the country.

Table 2C: Chemical Waste Generation and Trade

Type of chemical waste	Generation (tonnes/year)	Export (tonnes/year)	Import (tonnes/year)
Mine tailings, acids, cyanide, mercury and arsenic compound etc.	N/A.		_
Spent lubricating oils, residue and effluent from oil refinery.	N/A.	_	_
Waste dyes, and other textile chemicals	N/A.	_	_
Heavy metals, spent catalysts, lubricants from metal industries	N/A.	_	_
Inorganic wastes (clinker, metal oxides, cryolite, etc.)	N/A.	_	_

P/S: N.A. = Not available.

CHAPTER 3 : PRIORITY CONCERNS RELATED TO CHEMCIAL PRODUCTION, IMPORT, EXPORT AND USE

3.1 PRIORITY CONCERNS RELATED TO CHEMICALS IMPORT, PRODUCTION AND USE

Chemical production in Ghana constitutes an only 3% of the total demand of chemicals. However, the production of salt from the sea is expected to increase and potentially have adverse effects on the coastal regions which contain wetlands which are natural habitat for a large number of sea shore birds and also a breeding for other marine life.

Majority of manufacturing industries in Ghana are located in the southern sector of the country (Greater Accra, Central and Western). Mining activities on the other hand are prevalent in the Ashanti and the Western Regions. Agro-based industries are distributed all over the country. With respect to production, import, export and use there are priority concerns for all sectors of application.

Liquid effluents emanating from many of the various industrial set-ups are discharged without any pre-treatment into nearby streams and rivers all of which end up in the sea (Gulf of Guinea). The effect of this is that in the receiving media for heavily populated industries (e.g. Tema area: Chemu Lagoon, Accra area: Korle Lagoon and Odaw river) there are signs of heavy pollution. In the mining areas (Western, Ashanti) there are already public outcry against the pollution of rivers which are the traditional sources of drinking water and hence inhabitants are encouraged to use bore-hole water for domestic purposes. The Environmental Protection Agency (EPA) is currently compiling data to set standards for permissible levels of pollutants that can be discharged as effluents.

Gaseous emissions from both manufacturing and mining industries are also of concern. There is usually uncontrolled emission of gases, particulate matter from industries as well as from vehicles. Table 3A summarises the main problem areas of concern related to sound management of chemicals.

TABLE 3A : Description Of Problem Areas

Nature of Problem	City/Region	Brief Description of Problem	Chemical(s) Pollutant (s)
Air Pollution	National	Emission of toxic gases, dust from industries, vehicles.	Dust, SOx, soot, Heavy metals, PAB.
Pollution of inland water ways	Regional	Indiscriminate dumping of solid and liquid waste from artisan workshops, farm run-offs	dyes, engine oil, heavy metals, fertilizer ($NO_{3,}$ PO_4), pesticides
Marine Pollution	Regional	Untreated waste from industry, dumping of raw sewage, Offshore oil exploration.	Crude oil, Heavy metal organic compound.
Ground water	National	Leaching of industrial and domestic waste	Heavy metals, pesticides.
Drinking Water	National	Movement of pollutants into water distribution network, excessive use of chemicals to treat water contaminated with nitrates and phosphates	Heavy metals, $PO_{4,}$ PAHs, $NO_{3,}$ $CHC1_{3,,}$ pesticide.
Soil Contamination	National	Indiscriminate dumping of solid and liquid waste from artisan workshops and industry, farm run-offs.	All chemicals, mineral oil, pesticides.
Storage and disposal of expired chemical	National	Improper storage and disposal methods. Lack of official supervision.	All types of chemicals.
Hazardous waste Treatment	Regional	No official guidelines and supervision. Limited control of disposal of industrial and clinical waste.	Infectious clinical sludge, PCBs, heavy metals.
Controlling chemicals import	National	Inadequate infrastructure to control and register imports. However, simple registration measures are somehow effective.	All chemicals.

Air Pollution

The process industries are most important air pollution sources. Pollutants emanating from such sources include dust from mining, cement, and metal industries, road construction, toxic gas emissions from aluminium smelting, mineral processing, oil extraction, steel works. Noxious gases such as NOx, SOx, H_2S, heavy metals such as Pb, Cd, As, Se compounds also emanate from furnaces as well as gaseous emissions from municipal incinerators where industrial and household wastes such as plastics, grease and other potential carcinogens (Polyaromatic hydrocarbons, PAHs), furans) are generated. There are ambient air quality guidelines. However, there is no regulation regarding permissible levels of pollutants that can be discharged into the air. Most industries have no exhaust treatment facilities.

Land transport is another source of air pollution. Major pollutants in this respect are: NOx, SOx, CO, heavy metals, PAHs and soot as a result of rapid urbanisation with its attendant increase in land transport but there is inadequate control and inspection procedures for automobile exhaust.

Water Pollution

Inland water bodies serve as sources of drinking water, river transport, fishing and also promote farming activities in the country. However, due to poor environmental health education some of these water bodies are also made to serve as receptacles for all sorts of waste materials, from industrial waste to municipal and raw untreated domestic waste. In addition, run-offs from farms also carry substantial pollutants (Pesticides and fertilizer) into such rivers. This is manifested in the high levels of heavy metals, NO_3, PO_4, pesticide residues, high biological oxygen demand (BOD) and chemical oxygen demand (COD) as well as low dissolved oxygen (DO) values etc as shown in recent analytical reports. These pollutants invariably affect human health, if fish and other edibles from the rivers are consumed. In an attempt to eliminate these pollutants, chemicals are rather introduced into the water through chemical purification. Even then it is doubtful if certain pollutants (e.g. organochlorines, PAHs, hydrocarbon wastes) can be removed by conventional water treatment procedures.

Most inland waters in the country drain finally into the sea (Gulf of Guinea), which harbours the two national sea ports. Some industries also discharge effluent directly into the sea.

Solid Contamination

Interactions with the chemical handlers indicate that storage of chemicals is a big problem. Most of these handlers especially those dealing with agrochemicals store them in open space or on the farm which eventually leach freely into the soil when it rains. Indiscriminate dumping of solid and liquid waste from industry, small scale artisans, and auto garages are also rampant as proper waste collection and disposal facilities are lacking. Consequently such wastes as well as other domestic and municipal solid waste are either buried, or heaped and left to the mercy of the elements.

Soil contamination as a result of industrial action is found to be high in industrial communities. The poor management of domestic and municipal waste coupled with negative attitude of the inhabitants make soil contamination a national issue.

Pesticide And Heavy Metal Residues In Food

The country uses large quantities of pesticides and fertilizers especially in the cultivation of local foods. Food contamination may possibly result from the pesticides used during grain storage. Heavy metals in food may result from contamination of livestock, pesticide residue, metal containers of (expired) food containers etc. Many shopkeepers (and consumers) disregard expire dates.

Monitoring of pesticides and heavy metal residues in both local and imported food is presently on a very low level and needs to be strengthened in terms of trained personnel and facilities. There is therefore the need for more analytical laboratories to be able to cover the whole country.

Occupational Health And Safety Issues

On occupational health and safety issues the survey revealed the following:

a. Most chemical handlers do not have the technical know how and do not understand the dangers associated with chemicals. There are extension officers who give technical advice to farmers but it appears they are too few. There is need for recruiting and training more extension officers to improve the situation.

b. Chemicals are handled without proper protective gear but in some of the large companies, especially the mines, the use of protective gear is enforced.

c. In most cases there are no first aid kits, fire extinguishers, showers, sand buckets etc. Workers are not conversant with the manipulation of these devices.

d. Empty chemical containers are either thrown away, or buried, or sold or reused. The dangers involved in these practices are obvious.

e. Respondents are worried about incidence of diversion of chemicals to other uses other than intended use. Culprits are usually non-technical personnel in terms of chemical handling.

f. Transportation of chemicals by land poses special problems. There are reports of tanker accidents claiming lives. Respondents also report accidents involving spillage of concentrated acids as a result of car accident. In one case the casualties had to be flown out to Europe for treatment and plastic surgery.

Storage And Disposal Of Obsolete Chemicals

Proper disposal of expired and obsolete chemicals is of major concern. Farm chemicals are left in the open on the farms; solvents and acids are stored together with other chemicals. Most chemical dealers just bury the chemicals and chemical containers without any supervision. Only a few seek advice from EPA and research institutions as there are no national guidelines on the issue.

Chemical Import Control Systems

There is no integrated information system on chemical trade. The EPA is currently developing a data base on chemical imports but this is in its infant stages. It is often therefore difficult to clearly identify some of the listed chemicals as only the trade names are given. CEPS and the Ministry of Trade have some information on chemicals arriving in the country. Chemicals also are sometimes smuggled into the country due to the lack

of or weak control systems at the borders. There is therefore the need to strengthen the human resource capacities and other facilities of these organizations in order to work out systems to facilitate information flow. Table 3B provides an overview of the priority concerns related to chemical management.

TABLE 3B: Priority Concerns Related To Chemicals

Nature of Problem	Scale of Problem	Level of Concern	Ability to Control Problem	Availability of statistical Data	Specific Chemicals Creating Concerns	Priority Ranking
Air Pollution	National	High	low	Insufficient	NOx, SOx, AS_2O_3, dust	1
Pollution of Inland Waterways	Regional	High	low	"	Pesticides, Industrial Waste, oil	1
Marine Pollution	Regional	High	low	"	Heavy metal Pesticides domestic waste	1
Ground-water Pollution	National	High	low	"	Pesticides residue, heavy metal	1
Soil Contamination	Regional	High	low	"	heavy metal, pesticides	1
Hazardous Waste Treatment Disposal	Regional	High	low	Insufficient	Clinical waste, heavy metal catalyst	1
Occupational Health: Agriculture	Regional	High	low	Insufficient	Pesticides, heavy metal	1
Occupational Health: Industrial	Regional	High	low	Insufficient	Acids, bases, hydrocarbons, radiations	1
Public health	National	High	low	"	Insecticides	1
Chemical Accidents: Industrial	Regional	High	low	Insufficient	acids, gas cylinder	2
Chemical accidents: Transport	National	high	low	Insufficient	acids, gas cylinder, petrochemicals	1
Unknown Chemical imports	National	high	low	Insufficient	Industrial chemicals, pesticides	1
Storage/Disposal of Obsolete Chemicals	National	High	Low	Insufficient	Spent oil acids, chemical waste	1
Chemical Poisoning/suicides	Regional	High	Low	None	Hg, CN, As	1
Persistent Organic Pollutants	Regional	High	Low	Medium	Pesticides, PCBs, PAHs	1

P/S Priority Ranking: 1=High 2=Medium 3=Low

3.2 Comments/Analysis

As indicated earlier on in the chapter, chemical information in relation to sound management of chemicals is scattered all over the various sectors of the economy. There is therefore the need for a multi-stakeholders approach, involving representatives from various government ministries as well as concerned parties outside of government such as industry, research institutions, labour and public interest groups. This will undoubtedly help strengthen the national capabilities and capacities for the sound management of chemicals in the country and fulfilling the objectives of Agenda 21. The Ghana Environmental Resource Management project (GERMP) seeks to tackle most of the existing environmental problems as most of such problems are clearly identified in the monitoring aspect of National Environmental Action Plan (NEAP). The objectives of the quality monitoring programme include the following:

1. Identification and quantification of specific pollutants for enforcement actions against industries in violation of permitted discharge.

2. Developing baseline data for assessment of impact due to release of pollutants into various water bodies in the country.

3. Gathering of qualitative and quantitative measurements of pollution and identification of chemical parameters for use in modeling.

4. Setting of standards for effluent discharge from various industries and effluent receiving water bodies.

5. Development of baseline data to assess potential impact due to proposed development.

To help address the country's priority concerns or needs as described in Table 3A and 3B above and elsewhere in the chapter the following urgent measures are recommended:

1. Provision of specialised infrastructure and man power needs for quality control and certification, sanitation and waste management, toxicology, legal and non-regulatory mechanisms as well as trade.

2. Strengthening capacities in the Ministries of Trade and Industries, Environment Science and Technology, Health, Employment and Social Welfare, Food and Agriculture, Lands and Forestry, and Roads and Transport in order to facilitate the proper monitoring of chemicals throughout their life cycle in the country.

3. Actively involve NGOs in awareness creation through various educational programmes.

4. Establish national information and documentation and systems for the sound management of chemicals.

CHAPTER 4: LEGAL INSTRUMENTS AND NON-REGULATORY

MECHANISMS FOR MANAGING CHEMICALS

The place of law in the management and control of the risks posed by chemicals to man and the environment is well established. The variety of controls that seek to respond to the myriad of threats by the use or misuse of chemicals include principal acts and subsidiary legislation, guidelines, import and export procedures and codes of conduct or practice.

Currently, Ghana has no comprehensive legislation devoted to chemicals though one could deduce aspects of chemicals management from various laws in existence. The next best solution has been an administrative procedure which has been implemented by the Environmental Protection Agency (EPA) since 1989 titled "Chemical Import Procedures." It covers consumer, industrial and agricultural chemicals.

The procedures involve a permit clearance mechanism which allows screening and therefore monitoring of all chemicals that are imported into Ghana. The purpose is to prevent the importation of toxic wastes or chemicals that are either banned or severely restricted so as to protect human health and the environment and enhance the sound management of all types of industrial, commercial and agricultural chemicals.

With specific reference to pesticides however, the Pesticides Control and Management Act, 1996 (Act 528) comes to fill an important vacuum in Ghana's overall effort at minimising the dangers that arise from the misuse of pesticides.

4.1 OVERVIEW OF NATIONAL LEGAL INSTRUMENTS WHICH ADDRESS THE MANAGEMENT OF CHEMICALS.

Currently, Ghana has no framework legislation on the environment though work has started in that direction. When completed, the law will, in all respects, be similar to equivalent legislation existing in other jurisdictions.
It will cover all aspects of environmental protection and integrated pollution control.

Although the E.P.A. Act of 1994 (Act 490), has some provisions relating to chemical control, its primary object is to provide for the Agency as an institution and its functions. The normal details to be expected in a framework environmental protection law are absent. Nevertheless, the functions given by Act 490 to the Agency are broad enough to cover all aspects of chemicals management in Ghana.

The operationalisation of the Pesticides Control and Management Act will further strengthen the arms of the Agency in the overall management of chemicals. A substantial body of the existing legislation relates to the agriculture and health sectors. Due to the country's heavy dependence on agriculture, a lot of pesticides are used to control pests and other plant diseases.
The mining industry, is currently the highest contributor to the national exchequer. However, as in other major mining countries, the minerals have been mined at a cost to

the environment. The various chemicals employed in the mining industry pollute water bodies, vegetation, soils and marine life.

The body of mining laws seek to address the totality of these problems through provisions relating to environmental protection in the mining process. Regulations under the principal act on mining are yet to be adopted, although a draft has been prepared. In the interim, the environmental impact assessment procedures, help to fill whatever gaps exist, by committing the mining industry to putting in place pollution control measures.

In the health sector, the Food and Drugs Law seeks to ensure that only safe and wholesome food, drugs and other substances are made available for public consumption.

The Factories, Offices and Shops Act of 1970, Act 328, on the other hand seeks to protect the health and safety of workers from, inter-alia, the dangers posed by chemical to employees in the working environment.

The Standards Decree NRCD 173 ensures that products manufactured in Ghana meet internationally accepted standards of quality before they are offered for sale.

TABLE 4.A: ***References to Existing Legal Instruments which Address the Management of Chemicals***

Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories Covered	Objectives of Legislation	Relevant Articles	Resources Allocated	Enforcement Ranking
Environmental Protection Agency Act, 1994 (Act 490)	Ministry of Environment Science and Technology, EPA	ALL	Establish EPA and provide for its environmental protection and related functions	Sections 2(f-h)10	N/A	F
The Pesticides Control and Management Act, 1996 (Act 528)	EPA and Pesticides Technical Committee (Act 490)	Plant regulator, defoliant, desiccant and wood preservatives, industrial and agrochemicals	Control, management and regulation of pesticides	Parts I & II dealing with registration and licensing requirements	N/A	F
MercuryLaw, 1989 (PNDCL 217)	Ministry of Trade & Industry	Mercury or quicksilver	Regulates the import, purchase, sale or transfer of mercury	Section 1-5	Nil	W
The Mineral (Off Shore) Regulations, 1962 (as amended)	Ministry of Defence and Interior	Offshore minerals	Regulate the activities of licences to ensure protection of marine environment	Section 10 (1)	Nil	W
Oil in Navigable Waters Act 1964 (Act 235)	Ministry of Roads & Transport	Oil	To enable effect to be given to the International Convention for the Prevention of Pollution of the Sea by Oil, 1954	Sections 1,3 (1) (2); 4(5);5,6, 11(1), 13, 16(1), 20(1)	N/A	W
The Petroleum Regulations, 1959	Ministry of Mines & Energy	Petroleum	Regulate the importation,	Part I-III	N/A	W

			shipping, landing and storage of petroleum			
Safety (Petroleum) Rules, 1959	Ministry of Mines & Energy	Propane, Butane, Aviation and Motor Spirit, thinners, highly aromatic spirits and alcohols of synthetic resin type, turpentine, Kerosene, Gas, Diesel and Lubricating fuels, Bitumen	Control of marketing installation-layout, plant and equipment. Handling fire precautions & transportation.	Parts I-IV	N/A	W
Food and Drugs Law, 1992 PNDCL 305 B	Ministry of Health	Drugs, Cosmetics, devices and germicides antiseptic, disinfectant, detergent, pesticide, insecticide, rodenticide, vermicide	Control of food, drugs, cosmetics, devices and chemical substances so as to protect the health of consumers	Part II	N/A	W
Importation of Plants Regulations Cap 159	Customs, Excise & Preventive Services, Min. of Food & Agriculture	Disinfectant & fumigants	Regulating importation of plants so as to prevent the introduction of pests and plant disease	Section 2 &3	N/A	F
Standards Decree, 1973 (NRCD 173)	Ghana Standards Board, Ministry of Trade and Industry	Manufactured Products	Promote standardization of goods produced in	Sections 2&3		

			Ghana			
The Mosquitoes Ordinance Cap 75 (1951 Rev)	Ministry of Local Government	Pesticides	To provide for destruction of mosquitoes	Section 3 (1) & (2) See Seventh Schedule of Act 462	N/A	W
Infectious Diseases Ordinance Cap 78	Ministry of Local Government	Disinfectant & fumigants	Infectious diseases and measures to contain their spread through regulations	Laws of the Gold Coast (1954 Rev) Vol. III P. 78 et seq Seventh Sch. Act 462.	N/A	W
The Prevention and Control of Pests and Diseases of Plants Act 1965 (Act 307)	Ministry of Food & Agriculture	Pesticides	Control of pests and diseases	Sections 7&8	c50m'	F
Prevention of Damage by Pests Decree, 1968 (NCCD 245)	Ministry of Food & Agriculture	Insecticides & Disinfectants	Controls food and feeding stuffs to ensure that these are free from contamination, infection by pests	Paragraph 1	*	F
Cocoa Industry (Regulations) (ConsolidationDegree, 1968)	Ministry of Food & Agriculture	Pesticides	Cleansing and proper maintenance of premises in which cocoa is kept or stored	Reg. 1 (4) (e)	N/A	F
Fruit Industry Decree 1969 (NLCD 356)	Ministry of Food & Agriculture	Pesticides	Provides that regulations may be made for the cleansing,	L.I. 645 and 646	*	F

			maintenance and control of premises where fruits intended for export is to be kept or stored			
The Factories & Shops Act, 1970 Act 328	Ministry of Employment and Social Welfare	Industrial, Consumer and agro-chemicals	Occupational health and safety within the working environment		N/A	F
Tsetse Fly (Control) Ordinance No. 34 of 1955	Ministry of Food & Agriculture	Insecticides	Control of the tsetse fly and its breeding grounds	Section 2	N/A	F
Merchant Shipping (Dangerous Goods) Rules 1974 L.I. 971	Ministry of Roads and Transport.	Explosives, gases inflammable liquids and substances, oxidizing substances, radio active substances	To secure safety in the packing and shipment of dangerous goods	Rules 1-3 and Third Schedule	N/A	W
Minerals & Mining Law, 1986 (PNDCL 153)	Ministry of Mines & Energy	All chemicals employed in the mining sector	To provide for mining of minerals and matters relating thereto	Regulations to be made under Section 83	N/A	F
Ghana National Petroleum Corporation Law, 1983 (PNDCL 64)	Ministry of Mines & Energy	Crude oil, natural gas & petroleum	Exploration development production and dispersal of petroleum	Section 2	N/A	F
Fisheries Law, 1991 (PNDCL 256)	Ministry of Food & Agriculture (Fisheries) Minister for Transport and Communications	Explosive substances, noxious or poisonous matter	To regulate all issues relating or incidental to the fishing industry	Section 35 (1)	N/A	F

Customs Excise & Preventive Service (Management) Law, 1993 (PNDCL 330)	Ministry of Finance	All imported chemicals	Regulation of all imports into Ghana	Part I	N/A	F
Explosives Regulations 1970 L.I. 666	Ministry of Mines & Energy Mines Department	Explosives	To provide for all matters relating to import, transportation and use of explosives	All Sections	N/A	W

F = Fair, W = Weak

***** The Plant Protection and Regulatory Services of the Ministry of Food & Agriculture (MOFA) provided the sum of c50,000,000.00 as budget allocated for Pest Control activities. The figure is therefore applicable to all MOFA activities in this area.

4.2 SUMMARY DESCRIPTION OF KEY LEGAL INSTRUMENTS RELATING TO CHEMICALS

As was noted earlier, there is presently no comprehensive legislation that deals with all aspects of chemicals management. The closest that one can get to is Act 490 which established the Environment Protection Agency.

The Act mandates the Agency:

- to co-ordinate the activities of such bodies as it considers appropriate for the purpose of controlling the generation, treatment, storage, transportation and disposal of industrial waste;

- to issue environmental permits and pollution abatement notices for controlling the volume, types, constituents and effects of waste discharges, emissions, deposits or other sources of pollutants and of substances which are hazardous or potentially dangerous to the quality of the environment or any segment thereof;

- to prescribe standards and guidelines relating to the pollution of air, water, land and other forms of environmental pollution including the discharge of waste and the control of toxic substances.

Under Section 10 of the Act a Hazardous Chemicals Committee is established. It is a Committee of the Board. It is charged with the following functions:

a. monitoring the use of hazardous chemicals by collecting information on importation, exportation, manufacture, distribution, sale, use and disposal of such chemicals;

b. advising the Board and the Executive Director on the regulation and management of chemicals; and

c. performing such other functions relating to such chemicals as the Board or the Executive Director may determine.

Under Section 28 of Act 490, regulations may be adopted on the details of substances that may be released into the environment; other details relate to substances which may be hazardous to the environment.

The Pesticides Control and Management Act 1996 (Act 528) covers all classes of pesticides. The law provides for registration and additional requirements on labeling, advertisement, packaging, transportation, use and safety, storage and disposal.

4.3 EXISTING LEGISLATION BY USE CATEGORY ADDRESSING

VARIOUS STAGES OF CHEMICALS FROM PRODUCTION/IMPORT THROUGH DISPOSAL

As was noted in the preceding paragraph, Act 490 as drafted can be interpreted to cover all chemicals in use in Ghana. This fact notwithstanding, there are other laws that are specific to particular chemicals. The pesticides legislation covers all classes of pesticides. The mercury Law covers mercury or quicksilver and provides for imports, possession, purchase, sale or transfer and good mining practices in the use of mercury in mining operations.

The Mosquitoes Ordinance and related legislation on infectious diseases, tsetsefly control, pests and plant diseases, demand an enormous use of pesticides.

The Food and Drugs Law covers pesticides, antiseptic, disinfectant and detergent and seeks to protect consumers against their misuse in food or drugs.

Table 4.B Overview of Legal Instruments to Manage Chemicals by Use Category

Category of Chemical	Import	Production	Storage	Transport	Distribution/ Marketing	Use/ Handling	Disposal
Pesticides (agricultural, public health and consumer use)	X	X	X	X	X	X	
Fertilizers **Industrial chemicals (used in manufacturing/ processing facilities)**	X	X	X	X	X		
Petroleum Products	X	X	X	X	X	X	
Consumer Chemicals	X	X	X	X	X		X
Chemical Wastes		X	X	X			X
Others							

4.4 SUMMARY DESCRIPTION OF KEY APPROACHES AND PROCEDURES FOR CONTROL OF CHEMICALS

Currently, the major policy approach for the control of various classes of chemicals is through the clearance permit procedure mentioned in the introductory part of this chapter.

The procedure focuses on screening and therefore monitoring of chemical imports to ensure that banned and restricted chemicals are dealt with as such. Currently, there is no general registration of chemicals in Ghana. With specific reference to pesticides however, the new pesticides legislation provides rules for registration manufacturing, use, non-disclosure of information, classification, licensing, reporting, labeling and inspections.

From the structure of the law it appears most of the control procedures will be dealt with at the time of registration while monitoring will be achieved through inspections. It is noted that the Pesticides Act deals only with pesticides.

Table 4.C: Banned or Severely Restricted Chemicals

Name of Chemical	**Level of Restriction Ban (B) or Severe restriction (SR)**	**Details of Restriction e.g. reason for control action, remaining allowed uses, etc.**
Aldrin	Ban	Persistent Safer alternatives available
Dieldrin	Ban	As above for Aldrin
DDT	Ban	Other safer alternatives available
Parathion	Ban	Highly toxic Safer alternatives available
Flouroacetamide	Not in use	
γHCH (Lindane)	SR	Safer and non persistent insecticides available
Chlordane	Not in use	
Ethylenedibromide	Ban	Highly toxic Safer alternatives available
Monochlotophos	SR	Acute toxicity
Heptachlor	Not in use	
Mercuric Compounds	No action yet	
Crocidolite	No action yet	
Polybrominated Biphenyls (PBBs)	No action yet	
Polychlorinated Biphenyls (PCBs)	No action yet	
Polychlorinated Terphenyls	No decision	

4.5 NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS.

No records exists on the use of voluntary actions, incentives as non-regulatory mechanisms for the management of chemicals.

Ghana however is a Party to the Montreal Protocol on substances that Deplete the Ozone Layer. As part of measures to give effect to Ghana's obligations as a Party, it was envisaged that various fiscal policy measures will be employed to achieve our obligations. These include, import duties, tax concessions etc. to manage ozone depleting substances prior to the adoption of legislation.

The Customs, Excise and Preventive Services (CEPS) will be jointly responsible for implementation. The implementation will cover all chemical substances listed in the relevant annexes of the draft law.

Funding for this exercise will come from the normal budget of the implementing institutions as well as other fees and charges collected by them in the discharge of their duties.

4.6 COMMENTS / ANALYSIS

As has been noted, there is as yet no comprehensive legislation covering all chemicals. Currently, it is the environmental Protection Agency that handles all issues relating to chemicals that have not been granted exclusively to other agencies. There are no overlaps in the system of management though gaps exist in respect of chemicals other than pesticides , mercury and petroleum.

Enforcement of legislation generally has been a problem in Ghana. It is not as effective as would be expected particularly in the area of chemicals. Among the factors that have been identified are financial constraints, lack of appropriate monitoring tools and equipment, an ill-motivated law enforcement personnel, inadequate penalty provisions, a slow judicial process and lack of institutional co-operation.

Non-regulatory instruments and mechanisms as instruments are of a fairly recent origin. Consequently it is yet to catch-up with individuals and industry. The need for massive education is paramount. The thrust of the awareness programme must be on alerting the large illiterate population to the dangers posed by misuse of chemicals. Industry of course must be encouraged to adopt self-regulatory programmes and approaches to minimize the risks entailed in the use of chemicals while government must be convinced that non-regulatory schemes can be as effective as the threat of sanctions in the management of chemicals. The aforementioned will provide the framework for the success or failure of any policy instruments that will be put in place.

Enforcement in the field of environment is not very effective at the moment. In a number of cases, penalty provisions in the laws have become outdated. The slow, lethargic and

procedural complexities of the judicial system is another bottleneck. Lack of financial resources and inadequate personnel also hinder effectiveness and efficiency.

It is difficult to say that existing legislation addresses all of the environmental concerns listed in Chapter 3. Concerns like pollution and contamination requires a lot of serious research that will employ sound internationally acceptable techniques and state of the art equipment to produce the required results. Currently, there is no legislation that addresses all of the threats posed. A framework legislation on environmental protection is under preparation.

A comprehensive legislation covering all chemicals is envisaged. A pesticides legislation has been adopted which incorporates all the international techniques for the management of pesticides. The FAO Code of Conduct on the Distribution and Use of Pesticides provide the inspiration and guidance for the Pesticides Control and Management Act, 1996. The Act also incorporates the Prior Informed Consent (PIC) procedure. The Ministry of Food and Agriculture and the EPA under the Ministry of Environment, Science and Technology have been responsible for these initiatives.

The Oil in Navigable Waters Act, 1964 was passed to enable effect to be given to the International Convention for the Prevention of Pollution of the Sea by Oil.

The Merchant Shipping (Dangerous Goods) Rules, 1974 L.I. 971, is based on the International Maritime Dangerous Goods Code.

The Department of Factories Inspectorate registers factories, ensures safe working conditions, and prevention of occupational accidents and diseases at all working places. Employers are also required under the law to file notifications of accidents, dangerous occurrences, and industrial diseases.

The Department carries out technical inspections of all premises covered by the Act which includes factories, offices, shops, warehouses, wharves, docks, works of engineering and construction sites and premises where one or more steam boilers are used and where one or more persons are employed.
The department also undertakes industrial hygiene survey to identify and evaluate toxic chemicals Inspectors also investigate reportable occupational accidents and diseases to identify causes and to institute remedial measures to prevent recurrence.

The environmental impact assessment procedures administered by the Environmental Protection Agency is an additional tool for the management of chemicals for any industry or undertaking that will employ such substances. Authority to issue environmental permits and pollution abatement notices is also granted to the Agency.

CHAPTER 5: MINISTRIES, AGENCIES AND OTHER

INSTITUTIONS MANAGING CHEMICALS

5.1 RESPONSIBILITIES OF DIFFERENT GOVERNMENT MINISTRIES, AGENCIES AND OTHER INSTITUTIONS

Ministry of Environment, Science and Technology

The Ministry of environment, Science and Technology (MEST) was established in 1994 when the former ministries of Environment, Science and Technology were merged. MEST was created in response to a national development need to integrate environment, scientific and technological consideration in the country's sectoral, structural and socio-economic planning processes at all levels.

The Environmental Protection Agency is the institution under the MEST which is at the forefront in the implementation of legislation designed to manage chemicals and generally to control pollution and protect Ghana's environment.

5.2 DESCRIPTION OF MINISTERIAL AUTHORITIES AND MANDATES

Table 5.A:

Stage of Life Cycle/Ministry Concerned	Importation	Production	Storage	Transport	Distribution/ Marketing	Use/ Handling	Disposal
Environment Science & Technology	X	X	X	X	X	X	X
Health						X	
Food & Agriculture	X		X	X	X	X	X
Employment & Social Welfare						X	
Trade & Industry	X				X	X	X
Mines & Energy			X	X	X	X	X
Roads & Transport				X			
Finance	X						

Ministry of Employment and Social Welfare

This Ministry is responsible for issues relating to the working population and consequently for the implementation of the International Labour Organisation's treaties aimed at ensuring maximum protection and safety for workers against chemical hazards. It administers and enforces the Factories, Offices and Shops Act, 1970 (Act 328) and its subsidiary legislation through the Factories Inspectorate Department. Inspectors carry out inspections to ensure that the provisions of the laws relating to occupational safety and health are strictly adhered to. The inspections also cover risks of exposure to physical and chemical agents. There is however a need for more occupational health specialists to deal with problems that may arise and the setting up of hygienic standards for chemical agents.

Ministry of Food and Agriculture

The Ministry is responsible for all policy issues on Ghana's food and agricultural production and practices. A number of Departments fall under the Ministry including Fisheries, Veterinary Services and Plant Protection and Regulatory Services (PPRSD).

The Ministry and its institutions has an important role to play in the management of chemicals due to the large proportion of the population involved in the food and agricultural sector. The Plant Protection and Regulatory Services is responsible for educating farmers on the safe use of pesticides. This function will now continue within the context of the inter-institutional Pesticides Technical Committee. The Fisheries Department is also responsible for implementing the fisheries law which among other things prohibits the use of chemicals in fishing.

There is a high level of well-trained officers including Subject Matter Specialists (SMS) who train Front Line Staff (FLS). The FLS in turn train the farmers who are the main users of the chemicals.

Ministry of Mines and Energy

The Mines Department of the Ministry is responsible for the enforcement of the provisions of the Mining and Minerals Law and regulations made thereunder which cover inter-alia, health and safety in the mining environment. The Department also monitors the use and storage of explosives in the mining sector.

Ministry of Trade and Industry

The Ministry is empowered under the Mercury Law to grant a license to any person who wishes to import mercury into the country. The Minister is also empowered under the Imports and Export (Permitted and Prohibited Goods) Regulations, 1980 to grant

licenses prior to the importation of goods specified in the second schedule which includes a number of chemicals.

Ministry of Health

The Ministry of Health plays an important role in the area of occupational health of workers who could be exposed to chemical hazards and safety and therefore serves on the Pesticides Technical Committee. Additionally, narcotic drugs can be imported or exported only under a license granted by the Minister.

Ministry of Local Government

The Local Government Act, !993 breathes a fresh air into the concept of Local Government through the concept of District Assemblies. The definition of "Sanitary Authority" under the Mosquitoes Ordinance (Cap 75) is amended to mean "the Medical Officer of Health or Sanitary Inspector for any area in which a District Assembly is established under the Local Government Act, 1993 (Act 462). A similar amendment is made in respect of the definition of "Sanitary Inspector" under the Infectious Diseases (Cap 78). The Environmental Health Officers who now fall under the Ministry are responsible for ensuring the dangers posed by chemicals in the enforcement of the aforementioned laws are dealt with properly.

5.3 COMMENTS/ANALYSIS

As the review has shown, there are several laws that deal with one aspect of chemicals management or the other. Since an implementation role has been given to different institutions, the possibility of overlaps of mandates and indeed conflicts are real and has been experienced. The lessons provided by these conflicts has been utilized in the process of drafting more recent laws like the Pesticides legislation, which provides for the Pesticides Technical Committee embracing all the key players in the management of chemicals at the national level. The Hazardous Chemicals Committee provided for under Act 490, also seeks to achieve a similar objective. Inter-ministerial consultations also assist in addressing potential conflicts.

The question of which Ministry is responsible for a particular mandate set out in a legal instrument is usually spelt out in plain language. It is at the agency or institutional level that a problem may arise particularly with respect to inspections. The number of institutions involved in chemicals management is just sufficient. As they complement each other's role. There is no need for expansion of the present number of institutions involved in chemicals management in the country.
Additional institutions will not bring any innovation to the chemical management effort or at best they will duplicate what is being done already.
With the exception of the Environmental Protection Agency and the Ministry of Food & Agriculture and its agencies and institutions, the degree of implementation is fairly weak.

The reasons have already been given under 4.6. Extremely tight budgets are hampering the effectiveness of concerned Ministries in their efforts at implementation. This is a fundamental problem which must be resolved before any progress can be made.

CHAPTER 6 : RELEVANT ACTIVITIES OF INDUSTRY, PUBLIC INTEREST GROUPS AND THE RESEARCH SECTOR.

The activities of non-governmental bodies and entities which support national efforts to manage chemicals are many and diverse. Among the institutions outside government are professional and industrial organizations. There are also private individuals who support chemical management effort. Some of these non-governmental bodies have functions that cut across the entire life cycle of chemicals. While some are only users of chemicals others produce, formulate, import, store and/or distribute.

Though most of these bodies have performed creditably over the years, the absence of the necessary legal mandates has resulted in many institutions being unable to enforce rules and regulations that go with chemicals management.

6.1 DESCRIPTION OF ORGANIZATIONS/PROGRAMMES

These organizations have been categorized according to handling of the five main classes of chemicals identifiable in the country viz., agrochemicals, industrial chemicals, pharmaceuticals, petrochemicals/petroleum products and commercial/consumer chemicals. For the purpose of this profile, a few representatives of each class are listed, and information on name of organization, name and position of contact person, address, phone, fax and e-mail address (where applicable) and a brief statement describing related activities and areas of interest is provided.

Table: 6A: DESCRIPTION OF ORGANISATIONS AND PROGRAMMES IN AGROCHEMICALS (A)

ORGANIZATION	SYMBOL	CONTACT	MAJOR ACTIVITIES	INVOLVEMENT IN VOLUNTARY ACTION
Reiss & Co. (GH) Limited	A1	Mr. Krebs John Manager Agricultural Division P. O. Box 3074, Accra Tel. No. 233-21-775359 Fax 233-21-221972	Importation, distribution and sale of agrochemicals, provision of expert advice on application, storage and disposal of agrochemicals. Extension services provided to farmers.	FAO code of conduct, Responsible care and product stewardship programmes as demanded by law and EPA.
Ghana Cocoa Board (Cocobod)	A2	Mr. E. Opoku-Agyemang Ag. Regional Quality Control Manager P. O. Box 195, Koforidua Tel. 233-81-22233	Deals with the importation, Storage, use and disposal of pesticides applied in the Cocoa industry. Provision of information about risk associated with the use and handling of pesticides.	- do -
Hanafi Manufacturing Enterprises Limited	A3	Mr. Osman Hanafi Managing Director P.O. Box 3802 Accra Tel. 233-21-668438	Undertakes production and formulation of agrochemicals as well as industrial chemicals.	Not applicable
Ghana Cotton Company Limited	A5	Mr. H. A. Danlugu Production Manager P. O. Box 371 Tamale Tel. 22241	Engages in the storage, use and distribution of fertilizers and other agrochemicals.	Not applicable
Abuakwa Formulation Plant Limited	A6	Dr. E. A. Aryeetey/Mr. C. S Nsiah Chief Executive/Factory Manager P. O. Box M. 848 -Kumasi Tel. 233-51-50400 Fax: 233-51-50139	Production/formulation and importation of agrochemical	FAO code of Conduct.
Ghana Oil Palm development Company Limited	A7	Mr. E. A. Yeboah/C. Amo-Out Quality Control/Nucleus and Estate Manager P.O Box M. 428 - Accra Tel. 233-21-664423/669501 Fax: 233-21-667395	Storage of Agro/industrial Chemicals, uses, distribution recycling and disposal of chemicals.	FAO code of Conduct

Volta River Authority	A8	Director, Health and Safety Development P. O. Box 77 - Akosombo Tel. 233-251-593	Production of hydropower. Storage, use and transport of agrochemical.	FAO code of Conduct
Dagx and Agrofarma	A9	Christina Senyetor, - Storekeeper C/o Box 632 -Koforidua	Distribution of agrochemical	FAO code of Conduct
Nandom Agric Project (NAP)	A10	Mr. L. Kabo-Bah Project Manager C/o Fic Brothers, P. O. Box 229 - Nandom	Promotion of use of organic insecticides such as a local herb known as (lodal). Support the application of neem powders and tobacco teas. Engages in the distribution, use and storage of agrochemicals.	Not applicable
Plant Genetic Resources Centre CSIR	A11	Mr. E. Agyeman Dwomoh, Scientific Officer (Entomology) P. O. Box 7, Bunso Tel. 233-81-24124	Research Institution that screen various pesticides and assess their effects on in sect pests and crop yield. It stores and uses some agrochemical.	FAO code of Conduct
Crops Research Institute	A12	Mr. I. S. Banning - Scientific Secretary P.O. Box 3785 Kumasi, Tel. 233-51-60396 60389/60425Email: Criggd @ ncs. Com.gh	Research Institute that uses and carries out field test on the crops and or pests for which the agro chemicals concerned had been recommend by the manufacturers.	FAO code of Conduct
Cocoa Services Division	A13	Mr. J. B. Dankwah Regional Manager P. O. Box 1974 Kumasi	Performs field trials on farmers farms and stations. Storage, Uses, distribution, transportation, and disposal of agrochemical.	FAO Code Conduct/ Product stewardship.

Table 6B: DESCRIPTION OF ORGANISATIONS AND PROGRAMMES INDUSTRIAL CHEMICALS (D)

ORGANIZATION	SYMBOL	CONTACT	MAJOR ACTIVITIES	INVOLVEMENT IN VOLUNTARY ACTION
Nsawam Foam Company Limited	D1	Mr. C. K. Aboagye- Group Administration/Accounting Manager P. O. Box 5299 Accra-North Tel: 233 21 228949/229500 Fax: 233 21 228968	Imports polyol, TDI, methylene and acetone and use them for the production of foam.	Empowered by Act 328, 1970 to enforce the use of personal protective equipment by all workers.
Fan Milk Limited	D2	Mr. A. O. Lamptey, Internal Auditor P. O. Box 6460, Accra-North Tel. : 233 21 224421 Fax. : 233 21 221951 E-mail: Ghafan @ ighmail.com	Manufacture of ice creams and other milk products.	Not applicable
Guinness Ghana Limited	D3	Mr. Frederick Arman Aryeetey, Quality Assurance Manager, P. O. Box 1536 Kumasi Tel. : 233 51 26301-4 Fax. : 233 51 22537	Industry that undertakes analysis of its effluent discharges and flue gases. Production of beer and allied products.	Good House keeping and safety measures works.
Kumasi Brewery Limited (KBL)	D4	Mr. Leonard A. Egugwu P. O. Box 848 Kumasi Tel. 233 51 26271-9 Fax 233 51 25567	Imports and use chemicals for brewing activities. Does effluent quality analysis.	Good House keeping and safety measures works.
Two Worlds Manufacturing Company Limited	D5	Mr. Sonny Mould - Managing Director P. O. Box 3201, Accra Tel. 233 21 226732 Fax 233 21 223646	Engages in all the life cycle of chemicals. Manufacturing/ production of chemical products.	Monitoring of lead poisoning, solvent and powder inhalation.
Latex Foam Rubber Products Limited	D6	Mr. B. B. Kpentey P. O. Box 533, Accra	Manufactures foam for the Ghanaian and foreign markets. Imports needed chemicals.	Not applicable
Carmeuse Lime Products (Ghana) Limited	D7	Mr. R. A. Baldry - General Manager P. O. Box 1163 Takoradi Tel. : 233 31 46886 Fax. : 233 31 46072	Manufacture of lime products.	Not applicable

Fruits and Flavour Limited	D8	Mr. A. K. Agboodo/Mr. B. H. Soga General Manager/Quality Controller P. O. Box 97- Cape-Coast	Imports basic chemicals for production/formulation processes. Monitoring of residual chlorine in locally treated water, SO2 content of concentrates, residual essential oil in concentrates and acid content of effluents.	Not involved in any voluntary activities.
Intermediate Technology Transfer Unit (ITTU)	D9	Ms. Dorothy Anoma-Bempong Textile Assistant P. O. Box 1214, Koforidua Tel. : 233 81/23229	Dyeing of fabrics for local as well as foreign market. Uses the relevant dyestuff, caustic soda etc. for industrial processes.	Not applicable
Ghacem Limited	D10	Mr. E. Allotey Babington Head of Department P. O. Box 233, Takoradi Tel. : 233 31 22303/7 Fax. : 233 31 22618	Produces cement. Imports chemicals for use in manufacturing processes.	Not applicable
ICI Explosives (Gh) Limited	D11	Mr. Stephen J. Caldwell Operation Manager, P. O. Box 266 - Aviation House, Accra, Tel.: 233 21 773849 Fax. : 233 21 773849	Produces explosives for some of the mining companies in the country. Member Chamber of Mines. Undertakes research into alternatives for the chemicals they use.	Not applicable
Ghana Agro-Food Company	D12	Mr. J. Y. Sarpong - Environment Health and Safety Manager, P O. Box 11345Tema Tel. :233 22 204121 ,Fax. 233 22 204107	Importation, storage and use of some industrial chemicals.	Not applicable

Table 6:CDESCRIPTION OF ORGANISATIONS AND PROGRAMMES IN PHARMACEUTICALS (F)

ORGANIZATION	SYMBOL	CONTACT	MAJOR ACTIVITIES	INVOLVEMENT IN VOLUNTARY ACTION
Boakye Ansah Pharmacy	F1	Mr. Robert D. Ghansah Pharmacist Tel. : 32796	Undertakes production/formulation of some pharmaceutical products.	Good house keeping and safety measurers. Does chemicals risk assessment.
Kama Health Services Limited	F2	Mr. Samuel Akpor Botchway Administrative Manager P. O. Box 5437 Tel. : 233 21 775358 Fax. : 233 21 664315	Importation and production/formulation of pharmaceuticals.	Workers safety measurers. and responsible for care stewardship. Does testing and analysis of pharmaceutical products and retails drugs.
Intravenous Infusions Limited	F4	Mr. M. K. Aboagye General Manager P. O. Box 63, Koforidua Tel. : 233 81 2315/24203 Fax. : 233 81 24125	Importation, production and usage of pharmaceutical products. Expertise in manufacturing of intravenous, infusion. Involvement in the testing and analysis of pharmaceutical products.	Workers safety measurers. and responsible care stewardship. Does testing and analysis of pharmaceutical products and retails drugs.
Letap Pharmaceuticals Limited	F5	Mr. J. B. Abban, Director P. O. Box 3346, Accra Tel. 233 21 224613 Fax: 233 21 224693	Production, analyses and testing of pharmaceuticals.	Workers safety measurers. and responsible care stewardship. Does testing and analysis of pharmaceutical products and retails drugs.
Polafco (Ghana) Limited	F6	Mr. Charles Yaw Oduro Production Pharmacist P. O. Box 3887 Accra Tel. 233 21 226906	Production, importation, storage and distribution of pharmaceuticals.	Workers safety measurers. and responsible care stewardship. Does testing and analysis of pharmaceutical products and retails drugs.
Major and Co. Manufacturing Ghana Limited	F7	Mr. Samuel Kweku Obodai - Quality Control Manager, P. O. Box 620,Tema Tel. : 233 22 304255/6, 306269 Fax. : 233 22 306753	Manufacturing of pharmaceutical products. Engages in the storage, usage, transportation, distribution and disposal of drugs. Monitors the effects of drugs administered to patients.	Workers safety measurers. and responsible care stewardship. Does testing and analysis of pharmaceutical products and retails drugs.

TABLE 6D: DESCRIPTION OF ORGANISATIONS AND PROGRAMMES IN PETROCHEMICALS/PETROLEUM PRODUCTS (P)

Organization	SYMBOL	Contact	Major Activities	Involvement in Voluntary Action
Shell Ghana Limited	P1	Mr. Albert L. Sallah Dealer Manager P. O. Box 44Koforidua Tel. : 23384	Capacity for storage and distribution of petrochemcials/petroleum products.	Safety measurers for workers.
Elf Oil Ghana Limited	P2	Mr. H. A. Djegbo - Dealer P. O. Box 77 Koforidua Tel. : 233 8123383	Storage and distribution of finished petroleum products.	Safety measurers for workers.
Mobil Oil Ghana Limited	P3	Mr. Isaac Brewu - Manager P. O. Box 450, Koforidua Tel. : 233 81 22776	Storage and distribution of petroleum products.	Safety measurers for workers.
Mobil Oil Ghana Limited	P4	Mr. Samuel Tulashie Quality Control Officer P. O. Box 1050,Takoradi Tel. : 233 31 21159 Fax.:233 31 23432	Undertakes gas storage sales and distribution. Expertise in chemical risk assessment.	Safety measurers for workers.

TABLE 6E : DESCRIPTION OF ORGANISATIONS AND PROGRAMMES IN COMMERCIAL/CONSUMER CHEMICALS (C)

Organization	SYMBOL	Contact	Major Activities	Involvement in Voluntary Action
West African Mills Company Limited	C1	Mr. S. M. Morrison Quality Assurance Manager P..O. Box 257 Tel. : 233 31 22511-4 Fax. : 233 31 23394	Cocoa processing and production of cocoa butter and cake.	Responsible care programme for the production of works.
Ghana Cooperative Distillers Association	C2	P. O. Box 3640 Accra.	Distillation of alcohol and other products.	Not applicable
Fruit Processing Limited	C3	Mr. Albert Wiredu Ag. Quality Assurance Manager P.O. Box 121 Nsawam Tel. : 233 832 22009, 22214 Fax. : 233 832 22210 E-mail: astek @ ug. Gn. Apc. Org.	Fruit processing industry. Engages in extraction of fruit juice.	Not applicable

6.2 SUMMARY OF EXPERTISE AVAILABLE OUTSIDE OF GOVERNMENT

Table 6F provides a summary of expertise outside of government that support national efforts in the management of chemicals. In completing the table symbols for the various institutions were used (Refer to Tables 6 A-E.)

TABLE 6 F: SUMMARY OF EXPERTISE AVAILABLE OUTSIDE GOVERNMENT

Field of Expertise	Research Institutes	Universities	Industry	Environment/ Consumer Groups	Labour Unions	Professional Organisations.	Private Enterprises
Data Collection	A11, A12						
Testing of Chemicals	A11, A12		F2,F3, F4, F5, F6, F7, C3				A1, A5, A10, P1
Risk Assessment			A6, F7				A1, A2, A4, A7, A9,A10, P1, P3 P4, F1
Risk Reduction			A6, F7, C3				A1, A2, A4, A5, A7, A9, A10, P3, P4
Policy Analysis	A12						
Training and Education	A11, A12	A6, F2, F3, F5, F6, C1, C2					A1, A2, A5, A7, A9, A10, P1, P2, P3, P4
Research on Alternatives	A11, A12		F6, F7, C2, C3				A1, A2, A5, A10 P4
Monitoring	A12		F7				A5
Enforcement	A12						
Information to Workers	A11, A12		A6, F2, F3, F6, F7, C1				A1, A2, A5, A7, A9, A10 P4, P1 P2, P3,P
Information to Public	A11, A12		A6, F6, F7				A1, A9 P2
Institutional Cooperation	A11, A12		A6, F2, F5,F6, F7, C2,C3				A1, A4, A5, A7,A9, A10, P2, P3

Field of Expertise	Research Institutes	Universities	Industry	Environment/ Consumer Groups	Labour Unions	Professional Organization	Private Enterprises
Data Collection							
Testing of Chemicals			D4, D7, D9, D10				A13
Risk Assessment			D3, D4, D9, D10				
Risk Reduction			D1, D3, D4, D5, D6, D7, D9, D10				
Policy Analysis							
Training and Education			D1, D2, D3, D5, D7, D8, D9				A13
Research on Alternatives			D1, D2,D4, D5, D6				
Monitoring			D3, D8				
Enforcement							
Information to Workers			D1, D2, D4, D5, D7, D8, D9, D10				A13
Information to Public			D1, D8				A13
Institutional cooperation			D1, D2,D3, D4, D5, D6,D7, D8, D9, D10				

P/S: A=AGROCHEMICALS ; C=COMMERCIAL/CONSUMER CHEMICALS; D=INDUSTRIAL CHEMICALS ; F=PHARMACEUTICALS; P=PETROCHEMICALS/PETROLEUM PRODUCTS.

6.3 COMMENT/ANALYSIS

On the whole there is a good relationship between governmental and non-governmental organizations in the area of chemicals management. Though there is a two-way exchange of ideas/information between these two bodies, there is presently no government policy that obliges non-governmental organizations to either provide or obtain information from governmental entities.

Cocoa Research Institute of Ghana (CRIG) offers technical advice to farmers through their extension officers on the use of chemicals in the cocoa industry. Most of the non-governmental organizations presented in Table 6 A-E provide information both to their workers and the general public on the safe use of chemicals they handle. However, the adherence to the information provided is left to the individual since the non-governmental bodies have no legal obligation towards the individuals and enterprises they distribute chemicals to enforce whatever they believed in as regards the management of chemicals.

CHAPTER 7 : INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

The diverse nature of stakeholders in the chemical industry requires inter-sectorial networking in the management of chemicals. Various boards or committees consisting of representatives from some key stakeholders have been set up in the country. Some of these boards have legal mandates while others, usually ad hoc groups, are without the needed legal mandates.

7.1 INTERMINISTERIAL COMMISSIONS AND COORDINATING MECHANISM

Table 7 lists the existing cross-sectorial/ministerial coordinating mechanisms prevalent in Ghana

Table 7 : Overview of Inter-ministerial Commissions and Coordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective	Information Provided in section 7.2	Effective
Hazardous Chemicals Committee	Management of hazardous chemicals	EPA	Intersectoral	EPA Act (Act 490)	Yes	3
Imported Chemicals Monitoring Programme	Management of Industrial, Commercial and Agrochemicals	EPA	Intersectoral	EPA Act (Act 490; Pesticides Control and Management Act (Act 528)	Yes	2
Committee on Procedures for Disposal/destruction of obsolete chemicals	Management of obsolete chemical substances	EPA	Intersectoral	NIL	Yes	2
Pesticides Technical Committee	Control and Management of Pesticides	EPA	Intersectoral	Pesticides Control and Management Act (Act 528)	Yes	3

7.2 DESCRIPTION OF INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

7.2.1 IMPORTED CHEMICALS MONITORING PROGRAMME

This mechanism is an informal consultative and collaborative process. Imported industrial, commercial and agrochemicals are monitored from the port of entry to application, disposal of residues and empty containers. The objective of the mechanism is to ensure protection of human health and the environment through screening of all imported chemicals to ensure that banned and severely restricted chemicals are not imported into the country, and also that the London Guidelines on Chemicals in International Trade are observed by all importers of the specified chemicals. The scope of the mechanism covers industrial, consumer, commercial and agricultural chemicals. It does not however cover pharmaceutical preparations and veterinary drugs.

Parties to the mechanism include;

- Environmental Protection Agency (EPA)
- Ghana Standards Board (GSB)
- Ghana Ports and Harbour Authority (GPHA)
- Customs Excise and Preventive Services (CEPS)

These are mainly governmental Agencies, whose normal functioning involve either handling, permitting, collection duties on imported goods and chemicals or quality certification. There are no clear-cut scheduled meeting dates or types of issues for which meetings may be scheduled. Decision making and procedures for the monitoring are arrived at by individual parties, irrespective of the other parties. There seems to be no standard procedures among parties except for those that apply to the routine performance of the functions of the different parties.

The main weaknesses for the mechanism have to do with the following:

- The absence of a written working procedure and specifications of operational institutional responsibilities under the mechanism.

- The mechanism has no legal backing.

- Absence of non-governmental organizations in the operation of the mechanisms

* The interests of importers are not considered in decision-makings which most often affect timely clearance and release of consignments.

- Absence of an agreed focal-point and secretariat for the mechanism.

7.2.2 COMMITTEE ON DISPOSAL/DESTRUCTION OF OBSOLETE /

UNWANTED CHEMICAL SUBSTANCES

This committee is made up of an ad hoc group of inter-governmental agencies and institutions. The objective of the committee is to screen, cause to be tested, proposed disposal/options available for materials and supervise disposal/ destruction activities of recommended chemicals materials.

The scope of the committee covers only chemical substances that have the potential to injure or harm human beings or the environment if not properly disposed of or destroyed (toxic chemicals materials in the form of waste or residues.)

The following are the parties included in the committee:

- The Environmental Protection Agency (EPA)
- Customs Excise and Preventive Services (CEPS)
- Ghana Standards Boards (GSB)
- The Pharmacy Council of Ghana
- Ghana Atomic Energy Commission (GAEC)
- Plants Protection and Regulatory Services Department (PPRS)
- Waste Management Department of Accra Metropolitan Assembly.

The above listed are all governmental organizations. The committee used to meet once every 2 months. Decisions of the committee are based on consensus of members but with due regards to functional responsibilities of the individual parties in the committee.

The main weaknesses of the above mentioned committee are as follows:

- It is ad hoc in nature
- It lacks legal backing
- Decisions of the committee appears non-binding even on member parties
- In-adequate logistics to support and funds to service activities of the Committee

7.3.2 HAZARDOUS CHEMICALS COMMITTEE

This committee is inter-sectoral in nature. The functions of the hazardous chemicals Committee as stipulated in the EPA Act 490 section 10(3) are to monitor the use of hazardous chemicals by collecting information on the importation, exportation, manufacture, distribution, sale, use and disposal of such chemicals.

Advise the Board of the EPA and the Executive Director on the regulation and management of hazardous chemicals and

Perform such other functions relating to such chemicals as the Board or the Executive Director may determine.

The scope of the work of this committee covers all chemicals that by composition or description may be classified as hazardous.

The Hazardous Chemicals Committee is supposed to be constituted by the following:

- The Executive Director of the EPA as chairman.
- Three officers from the EPA

- Three other persons, being persons with specialized knowledge and experience in toxic chemicals management.
- Representative from the following Institutions/Organisations
- ♦ Ghana Standards Board (GSB)
- ♦ Ghana Cocoa Board (GCB)
- ♦ Crops Services Department of the Ministry of Food and Agriculture (MOFA)
- ♦ Veterinary Services Department of MOFA
- ♦ Council for Scientific and Industrial Research (CSIR)

The Hazardous Chemicals Committee though enjoying the legal backing of the EPA Act 490, is yet to be officially inaugurated. Since it is not yet functional, frequency of meetings, and decision - making procedures remains unknown.

The main weakness of this committee is therefore about its non-functional nature. Other weaknesses may become apparent when the mechanism becomes functioning.

7.2.4 **Pesticides Technical Committee**

The Pesticides Technical Committee is set up by the Pesticides Control and Management Act, 1996, Act 528. Its functions shall be such as under Act 528, relating to control and Management of Pesticides and as the Board of the EPA may assign to it.

The scope of this Technical Committee covers all pesticides classified either as general use or as restricted or suspended pesticides. The committee is made up of the following persons or representatives of institutions.

A chairman appointed by the EPA Board.
The Head of the Chemistry Department of the National Nuclear Research Institute of the Ghana Atomic Energy Commission.

- A representative from the Cocoa Services Division of the Ghana Cocoa Board.
- The Plant Protection and Regulatory Services of the Ministry of Food and Agriculture. (MOFA)
- The Director of the Veterinary Services Department of MOFA
- A representative from the Ministry of Health
- A representative from the Laboratory of the Customs Excise and Preventive Services (CEPS)
- A representative from the Association of Ghana Industries.
- A representative of the Ghana National Association of Farmers and Fishermen.
- A representative from the Ministry of Lands and Forestry.
- A representative from the Environmental Protection Agency.
- A representative of the Ministry of Environment Science and Technology (MEST)

In accordance with the act which establishes it, the committee shall regulate its own procedure. The structures for implementing provisions of Act 528, are being put into place so that this Technical Committee can officially started operations and hence decide on the frequency of meetings. The non-operational nature of the Technical

Committee until now is a major draw-back to managing and controlling pesticides in the country.

7.3 MECHANISMS FOR OBTAINING INPUT FROM NON-GOVERNMENTAL BODIES

The composition of the Pesticides Technical Committee includes non-governmental organization such as Ghana National Association of Farmers and Fishermen and Association of Ghana Industries. The presence of these organizations in the committee will enhance the process of consultation prior to decision making on matters that affect their members directly. This is also a way of reaching out to the larger public with relevant information and policy decisions as well as collecting information from relevant sectors of the economy.

Another mechanisms for NGOs participation in decision-making and implementation of chemicals management programmes and policies is through workshops and seminars to which these NGOs are invited for discussions.

7.4 COMMENT/ANALYSIS OF EXISTING INTER-SECTORAL / MINISTERIAL COORDINATING MECHANISMS

All the above mentioned existing mechanisms for chemicals management have identifiable weakness making them ineffective. As indicated, where legal backing o the mechanisms are absent, these legal instruments should be put in place. In some situations, the legal instruments are available but physical establishment or operationalisation of the mechanisms are lacking, and steps must be taken to constitute, inaugurate, and operationalise them where necessary

These apart, there is need for some organizational problems to be resolved so that decisions arising from these mechanism can be quickly implemented. Additionally, newsletters of these mechanisms can be established to enhance communication among all sectors of the economy. Finally, the need for strong political support for these mechanisms from sector ministries would go a long way to enhance chemicals management in Ghana.

For the existing mechanism it appears that all parties from the relevant ministries and agencies are represented. However, it is clear that some aspects of chemicals management have not been adequately covered. For example there is no mechanism in which emphasis is placed on the health related aspects of chemicals neither is public awareness creation the emphasis of any present mechanism. This situation gives reason to believe that the existing mechanisms are not adequate and the need for establishing additional coordinating mechanisms with emphasis on human health and public awareness creation among others.

The existing mechanisms have no linkages with each, and appear to work in isolation. There are no laid down procedures to bring in additional parties from within or outside of government into these mechanisms, nor opportunities for consideration of parties on case-to-case basis for inclusion into any mechanism.

There is serious information gap even among participating parties in the various mechanisms giving rise to duplication and creation of grey areas. There are no procedures for sharing information available among individual parties, except through formal requests to the holder of the information.

CHAPTER 8: DATA ACCESS AND USE

The Availability of accurate and reliable information is central to a good decision-making process. This also applies to decisions regarding sound management of chemicals. There is the need for accurate databases with regard to nature, type and quantities of chemicals produced, imported and used in the country to support a chemical management system.

8.1 AVAILABILITY OF DATA FOR NATIONAL CHEMICALS MANAGEMENT

In Ghana various ministries, organizations, institutions and companies have some information on production, imports, exports and use of chemicals.

On production the following may have some information:
- Association of Ghana Industries (AGI)
- Ministry of Environment Science and Technology (MEST)
- Ghana Statistical Services (GSS)
- Ministry of Trade & Industry

On importation of chemicals the following may hold some information:
- Custom, Excise and Preventive Service (CEPS)
- Environmental Protection Agency (EPA)
- Association of Ghana Industry (AGI)
- Ministry of Food and Agriculture (MOFA)
- Ghana Chamber of Mines
- Chemical Sellers Association
- Tema Oil Refinery (TOR)
- Ghana Supply Commission (GSC)
- Ministry of Education (MOE)
- Ministry of Health (MOH)
- Individual Private Companies

On exportation, information can be obtained from:
- Ghana Export Promotion Council
- Custom, Excise and Preventive Service (CEPS)
- Environmental Protection Agency (EPA)
- Individual Private Companies

There is no regular system to integrate the data held by these bodies and also the data may not be in the form that is easily accessible. The method of collecting and treating data is manual and depends to a large extent on individual efforts of officers or companies surrendering the information. Data on issues such as chemical accidents, levels of production, imports etc. at are not available. Table 8A provides an overview of quality and quantity of data available for different decision-making activities.

Table 8. A Quality and Quantity of Available Information

DATA NEEDED FOR/TO:	PESTICIDES (AGRICULTURAL, PUBLIC HEALTH AND CONSUMER USE)	INDUSTRIAL CHEMICALS	CONSUMER CHEMICALS	CHEMICAL WASTES
Priority Setting	Fair	Fair	Fair	Poor
Assess Chemicals Impact under Local Conditions	Fair	Fair	Fair	Poor
Risk Assessment (Environment/Health)	Fair	Fair	Fair	Poor
Classification/Labeling	Fair	Fair	Fair	Poor
Registration	Fair	Fair	Fair	Fair
Licensing	Fair	Fair	Fair	Fair
Permitting	Fair	Fair	Fair	Fair
Risk Reduction Decisions	Fair	Fair	Fair	Poor
Accident Preparedness/ Response	Fair	Poor	Poor	Poor
Poisoning Control	Fair	Fair	Fair	Fair
Emissions Inventories	Fair	Fair	Fair	Fair
Inspections & Audits (Environment/Health)	Fair	Fair	Fair	Fair
Information to workers	Fair	Fair	Fair	Fair
Information to the public	Good	Good	Good	Good

8.2 LOCATION OF NATIONAL DATA.

Table 8B gives an overview of the locations of national data such as waste generation, waste disposal etc. The ministries of Health, Works and Housing, Food and Agriculture are other possible sources of national data.

TABLE 8B Location Of National Data

Type of data	Location	Data source	Who has access	How to gain access	Format
Production Statistics	AGI, MOTI, SSD, MEST	Industry	Public	By request	Paper, File, Computer
Import Statistics	EPA, MOFA AGI, SSD, CEPS, CSA, GCM, MOTI	Industry Importers	Public	By request	Paper, File Computer
Export Statistics	EPA, MOFA, SSD, CEPS AGI, MOTI	Exporters	Public	By request	Paper, File, Computer
Chemical Use Statistics	EPA, MOFA, SSD, AGI	Industry	Public	By request	Paper, File, Computer
Industrial Accidents Reports	AGI, MOH, FID, LD	Insurance companies, Industry, Hospitals	Public	By request	Paper, File, Computer
Transport Accident Reports	Ministry of Roads and Transport (MTTU)	Insurance companies	Public	By request	Paper, File, Computer
Occupational Health data (Agricultural)	EPA, MOFA	Industry, Farmers	Public	By request	Paper, File
Occupational Health Data (Industrial)	Industry, LD, FID	Industry, Insurance companies,	Public	By request	Paper, File
Poisoning Statistics	MOH	Hospitals, Clinics	Public	By request	Paper, File, Computer
Pollutant Release and Transfer register	None	None	None	By request	None
Hazardous Waste Data	EPA, Industry, Municipal Authorities	Industry,	Public	By request	Paper, File
Register of Pesticides	EPA, MOFA	Industry, Farmers	Public	By request	Paper, File Computer
Register of Toxic Chemicals	None	None	None	None	None
Inventory of Existing Chemicals	EPA, MOFA, SSD, AG,I Universities,CSIR	Industry, Companies, Universities CSIR	Public	By request	Paper, File Computer
Register of Imports	EPA, MOFA, CEPS, MOTI	Industry Importers,	Public	By request	Paper, File, Computer
Register of Producers	EPA, Industry	Industry	Public	By request	Paper, File, Computer
PIC Decisions	EPA	Industry	Public	By request	Paper, File Computer

8.3 PROCEDURE FOR COLLECTING AND DISSEMINATING NATIONAL/ LOCAL DATA

1. According to EPA regulation on annual chemical clearance certificates, holders of such certificates must submit quarterly returns to the Agency on the chemicals imported. Importers of chemicals are also required to submit the requisite Material Safety Data Sheets(MSDS) in addition to bills of lading, airway bills or invoices which are properly vetted before permits / certificates are issued. This procedure covers all types of chemicals (pesticides, fertilizer, industrial and consumer).

2. Importers/manufacturers as well all chemical users are enjoined to furnish the EPA with any information on request.

3. Importers usually furnish the Customs Excise and Preventive Service (CEPS) with information on quantity, type, packaging and origin of all consignment of chemicals.

4. Information on banned or severely restricted chemicals can be obtained from FAO, UNEP and the USEPA.

5. Other methods used in collecting information on the use of chemicals and their harmful effect on the environment include:

- Administration of questionnaires that target specific groups and activities

- Planning and executing research to obtain data. The EPA, the numerous Research Institutions, Universities and the Ghana Standard Board are involved. Recently the EPA has obtained modern equipment to boost its efforts in monitoring air quality.

- The country has several specialized institutions such as Crop Research, Soil Research, Animal Research Institutes (all of Council for Scientific and Industrial Research (CSIR) and GSB capable of researching into various aspects of chemicals used in Ghana.

8.4 AVAILABILITY OF INTERNATIONAL LITERATURE

International literature that are accessible in the country include Scientific Journals, Technical Papers of the various UN agencies (FAO, UNEP, UNESCO, WHO etc.)

Table 8C: Availability of International Literature

LITERATURE	LOCATION	WHO HAS ACCESS	HOW TO GAIN ACCESS
Environmental Health Criteria Documents (WHO)	EPA, MOFA, GSB, MOH LIBRARIES	EPA/Public, Farmers, Industries	By Request
Health and Safety Guides (WHO)	MOH, EPA, Ministry of Employment and Social Welfare (FID)	Public, Health Personnel	By Request
International Chemical Safety Data Cards (IPCS/EC)	EPA, MOFA, MOTI	Public	By Request
Decision Guidance Documents for PIC Chemical (FAO/UNEP)	EPA, MOFA, MOH	Public	By Request
FAO,WHO, Pesticides Safety Data Sheets	MOH, EPA	Public	By Request
Documents from the FAO/WHO Joint Meeting on Pesticide Residue	EPA, MOFA	Public	By Request
Material Safety Data Sheets (Industry)	EPA	Public	By Request
OECD Guidelines for the Testing of Chemicals	EPA, GAEC,MOFA	Public	By Request
Good Laboratory Practice Principle	EPA, GAEC, GSB, Private Enterprises	Public	By Request
Good Manufacturing Practice Principle		Public	By Request
WHO/UNEP Global Environmental Library Network		Public	By Request

8.5 AVAILABILITY OF INTERNATIONAL DATABASES:

Enough information in relation to chemicals management exist in various international publications and databases. The problem is however the means and channels through which such information could be adequately solicited. Table 8D shows the prevailing situation in the country.

Table 8D: Availability of International Databases

DATABASE	LOCATION(S)	WHO HAS ACCESS?	HOW TO GAIN ACCESS
IRPTC	EPA	Public, Government Officials	By Request
ILO CIS	EPA	Government Officials	By Request
IPCS INTOX	EPA	Institutions, Agencies	By Request
Chemical Abstract Services Database	Universities, Research Institutions	Institutions, Agencies	By Request
Global Information Network on Chemicals (GINC)	EPA	Public, Institutions, Agencies	By Request
STN Database	Not Available	-	-

8.6 NATIONAL INFORMATION EXCHANGE SYSTEMS

Information from international organization to various institutions and ministries are often localized. Such information is usually kept in inventories of publications or libraries without dissemination or systems of exchange with other concerned parties or allied ministries/organizations. With a proper computerized network in place, vital information for sound chemicals management could be easily assessed. As at now, existing chemical information could only be solicited by request.

Effective co-ordination of activities among institutions, agencies and ministries with similar interests is normally carried out through inter-ministerial and inter-departmental committees, seminars, workshops and open discussions.

8.7 COMMENT/ANALYSIS

At present there exist a wide informational/literature base and distribution gap due to the non-existence of a centralized database system. To effectively tackle the numerous priority areas of concern, enumerated in chapter three, there is an urgent call for the establishment of an integrated chemicals management information system (ICMS). This will eventually facilitate the exchange and dissemination of information among concerned parties/stakeholders in chemicals management This will totally erode the existing overlap and complicating sources of information. The Environmental Protection Agency (EPA), the lead agency in chemicals management and other related issues in the country needs to be strengthened in terms of equipment/facilities and technical expertise to properly manage and control all stages of the chemical life cycle and enhance co-ordination among relevant national actors.

A centralized data base is thus envisaged to be located at EPA, which can be connected to the outside world through the Internet and other information networks.

CHAPTER 9: TECHNICAL INFRASTRUCTURE

9.1 OVERVIEW OF LABORATORY INFRASTRUCTURE

The major laboratories with capacity to analyse various chemicals substances are found in government institutions such as the Ghana Standards Board, the Geological Survey Department, Noguchi Memorial Institute for Medical Research, Water Research Institute(Aquatic Biology) the universities, and Ghana Atomic Energy Commission. These laboratories have been set up to perform specific functions and may not be available for other tasks. The Ghana Standards Board in particular is equipped with facilities to control quality of locally manufactured food and drugs. The Ghana Atomic Energy Commission (GAEC) was equipped in 1991 under an FAO Technical Cooperation Assistance to undertake National formulation control analyses of pesticides. The legal backing to support the activities of the laboratory and to make it operational was enacted in December 1996. With the exception of a few laboratories, have been certified for GLP by the GSB or any reputable body.

TABLE 9 A: OVERVIEW OF LABORATORY INFRASTRUCTURE FOR REGULATORY CHEMICAL ANALYSIS

NAME/ DESCRIPTION OF LABORATORY	LOCATION	EQUIPMENT/ ANALYTICAL COMPATIBILITIES AVAILABLE	MAKE AND MODEL	FUNCTIONAL STATUS	ACCREDITATION (IF YES, BY WHOM)	CERTIFIED GLP (IF YES, BY WHOM)	PURPOSE
Tema Oil Refinery	Tema	UV-Spectrophotometer Sulphur Analyser GLC Polarograph	Ceal-6600 Eraly 21M. Varian GC 3700 Metrohm Polarecord506	Functional Functional Functional Functional		No	Water analysis. Analysis of petroleum products, Analysis of finished products.
Tema Lube Oil	Tema	UV Spectrophotometer IR - Spectrometer Atomic Absorption Spectrometer Potentiometric Titratar	Beckman DV-650 Perkin Elmer FTIR-165 Perkin Elmer 3100 Metrohm 686	Functional	NO	NO	Testing of Raw materials and finished products.
Ghana Atomic Energy Commission/ National Nuclear Research Institute	GAEC Campus Kwabenya	Gas Chromatograph Gas Chromatograh AAS UV Spectrophotometer NAA	Dani 85121 Philips/Unicam 610 Unicam SP 1800	Non Functional Non Functional Non Functional Non Functional Functional	NO	NO	National pesticides formulation Control facility. Analyzing active ingredients. Content and physicochemical properties of pesticides. Pesticide Residue analysis. Heavy Metals

Biochemisty Department	University of Ghana Legon	Spectrophotometer (Double Beam) Spectrophotometer (Double Beam) HPLC System	Carl Zeiss Specord M 40 Shimadzu, UV-190 Shimadzu, LC -8A	Non Functional Functional Non Functional	NO	NO	Academic Training, Consultancy etc.
Geological Survey Dept.	Accra	AAS AAS3 Spectrophotometer Flame Photometer	Perkin Elmer Carl Zeiss Pye Unicam Corning Eel	Non Functional Non Functional Functional Functional	NO.	Factories Inspectorate	Silicate Analysis of Geological samples including Ores and Mineral Analysis.
Pioneer Food Cannery Ltd.	Tema	Mercury Analyzer Fluorometer	Bacharach Inc. Unipath # 450	Functional Functional	NO	Ghana Standards Board (GSB)	Food Analysis. Product quality Control analysis
Ghana Water & Sewerage Corporation (GWSC)	Accra	Gas Chromatograph Spectrophotometer	GC 14B WAL - F	Functional Functional	NO	NO	Monitor Water Quality/ Investigate Chemical Purity
Water Research Institute (WRI)	Accra	Atomic Absorption Spectrophotometer (AAS) AAS Vapour System Ion Chromatography	Philips PV 9200 Philips PV 92360X Disnex DX-100	Functional Functional Functional	Ghana Standards Board	Ghana Standards Board	Physico-Chemical Analysis of water and waste water samples.

		Digital Flame Analyser UV/VIS Spectrophotometer	Gallenkemp, 3AG Philips PV 8625	Functional Functional	" " "	" " "	Collection of Research and consultancy Series data.
Ghana Standard Board (GSB)	Okponglo/ East Legon Accra	UV Spectrophotometer High Performance liquid Chromatograph Chromatography Tanks Gas Chromatographs	Shimadzu UV 1201 Shimadzu SCL-613, LC-9A, CUO-6A Desamin 99 UVIS Varian 3300, Hewlett Packard 5898	Non Functional Functional Functional Functional Functional	No	UNDP WHO	Analysis of raw materials, manufactured or finished products. Food and Drug analytical services
Billiton Bogosu Gold Ltd.	Bogosu (Mine Site)	Atomic Absorption Spectrophotometer	Varian	Functional	No	No	Metallurgical Laboratory- Ore grades metallurgical processes
S. G. S. Laboratory Services	Accra	AAS Infrared Spectrophotometer (FTIR)	Spectra 5 an10 Perkin Elmer 1600	Functional Functional	No	-	Routine examination of samples of products intended for shipment.

9.2 OVERVIEW OF GOVERNMENT INFORMATION SYSTEMS/COMPUTER CAPABILITIES

The Statistical Services Department is the government department responsible for the management of information. However, there are a few government institutions like the Ministry of Food and Agriculture and the Ghana Standards Boards which have computer facilities for processing and storage of data.

Both government and private organizations have acquired computer systems and documentation within the framework of projects, specific to their areas of sectoral competence. Most computer systems are also used for accounting purposes, Internet information and word processing and to a lesser extent for data storage. Computer systems are IBM compatibles of 486 and Pentium microprocessor technologies.

TABLE 9 B: COMPUTER CAPABILITIES

Location or Organization	Computer System/ Database	Equipment available	Current uses
Ghana Water and Sewerage Corporation	Both stand alone/Network system	Main frame (IBM) micro computers AST Compaq	Billings Accounting word Processing i. e. Secretarial duties.
High Street, Accra Shell, Ghana	Both stand alone/ Network system	Micro computers CPCS	Management Information for all aspects of the company's business.
Pokuase (PPRS) MOFA	Stand alone system	Micro-computers (PCs)	Documentation and word-processing.
Letap Pharmaceuticals Accra	Stand alone system	Micro computers (PCs) (IBM)	Accounts, Inventory Control, Stack Maintenance
Tema (Pioneer Food Cannery)	Both stand alone/Network	Micro-computers (PCs)	Memos, Reports, Payroll, Flow Diagrams Budget.
Ghana Chamber of Mines, Accra.	Stand alone system	Micro computers compaq, AST premium II KL DRS M 40	E-mail, Internet information , Word Processing, Excel Accounting Packages etc.
Ghana Standard Board	Stand alone system	Micro computers (PCs) Parkard Bell Pentium 75 mttz, IVOMHZ, 133MTT IBM 386, Dell 486DX	Running of payrolls, Database, Maintenance, Desktop Publishing , Word Processing, Spread sheet.
Tema Oil Refinery Ltd.	Both stand alone/Network system	Mini computer, Micro computers	Departmental applications or uses.
Tema Lube Oil Company Ltd. Tema	Both stand alone/Network system	Mini computers, Micro computers	Departmental applications or uses. Data processing
Takoradi Polytechnic	Stand alone system	Micro computers (PCs)	Teaching and Training of students.
Factories Inspectorate Department	Stand alone system	Mini computers	Data processing, analysis etc.

MOFA, Animal Production Department	Network system	Mini computers	Animal production Records, Birth dates, Weekly average gains, sales moralities and mortalities.
Lawra Sec. School	Stand alone system	Micro computer	Practical training of students/masters
Veterinary Services dept.	Stand alone system	Main frame	Compilation and storage of records.
Carmeuse lime Products (Gh) Ltd. Takoradi	Stand alone system	Mini computers	Data storage - Test results stores Management, Accounting, Maintenance Programme.
Policy Planning, Monitoring and Evaluation	Stand alone system	Micro computers	Word processing, personnel Records, Data Bank District, profile, Targets measurable indicators and Achievement
Environmental Protection Agency	Networked system, Stand alone system, E-mail	Micro computers (PCs)	Data processing, storage Data base and Data Bank etc.
West African Mills Co. Ltd.	Both stand alone Networked system.	Micro computers (PCs) ALR	Word Processing, Analysis of Production Data, Accounting.

9.3 OVERVIEW OF TECHNICAL TRAINING AND EDUCATION PROGRAMMES

Secondary and Tertiary institutions in the country offer graduate and undergraduate training in analytical chemistry and environmental sciences. These courses prepare individuals for challenging positions in chemicals management. The Ministry of Agriculture also organizes training for rural farmers on the safe and effective use of pesticides. Other organizations and industries do run in-house training of their staff on safe handling of chemicals at the work place.

Table 9 C: Overview of Technical Training and Education Programmes

Organization	Academic Training	Gives Training to Beneficiaries of their Services	Work places where chemicals are used but provide training to their staff.
University College of Education Winneba	Teaching and Research activities		In service training/workshops.
Plantations Development Ltd. (Wa)			Training programmes aimed at educating Technical staff on the proper use of chemical.
Plant Genetic Resources Centre, Bunso.			Uses and Handling of Agrochemicals.
Factory Inspectorate Department, Accra.			Chemical and Physical Hazards./Occupational Health.
Chemical sellers Association Wa Branch			Training on Abuse and Misuse of Chemicals.
Nandom Agriculture Project			Provision of simple hand outs on handling and first aid. Education of use and disadvantages.
PPRSD, MOFA (Wa)	Agronomy, General Knowledge in Agriculture & Science, Entomology, Toxicology, Chemistry & Biochemistry	Train farmers on use of Pesticides and Management/ Handle outbreak cases. Handling of pesticides and disposal of chemical containers	Mindful of the environment in relating to chemical use. Protection of Water bodies against pollution and toxic substances.
Reiss & Co. Ghana Ltd. (Tamale)		Train client staff on chemical handling in the field, safety application techniques and maintenance of application equipment.	
Plant Protection and Regulatory Services Department. (Head Office)			Safe use of Pesticides, calibration of spraying equipment /FAO Support on above for selected officers.
Biochemistry Department University of Ghana.	Pollution Monitoring and Research	Train Students	Workshops and inservice training for workers.
Tema Oil Refinery Ltd.			Safety of use of chemicals at the workplaces.
The Ghana Chamber of Mines			Proper and safe storage /inventory keeping.

Chemistry Dept. University of Ghana Legon.	Teaching of practical skills necessary for working in a chemical laboratory.	Science Laboratory Training Scheme of the Universities of Ghana.	
Ghana Atomic Energy Commission Nuclear Research Institute/Dept. of Chemistry Kwabenya (GAEC)			On the Job Training Participation of staff in Regional and International training programme sponsored by Joint FAO/IAEA Division on Food and Agricultural Development.
Reiss & Co. Accra.		Safety on handling and applying Agrochemical	Materials provided by manufacturers, safety, toxicology, environmental concerns, storage, transport and first aid measures. Educating staff on safe and efficient use of Pesticides.
Shell Ghana Ltd. Accra		Training of Lube Bay Operatives on correct Disposal of Waste oils.	
Water Research Institute. Accra		Ensuring laboratory practices at Polytechnics and Universities.	
Mobil Oil Ghana Ltd.		Training to end users, environmental Health and safety. Advise on chemical Handling and storage	Chemical storage and handling safety stewardship problem.
Cocoa Services Division Ashanti, Kumasi.		Train farmers on safe use and application of agrochemicals. Good storage practices	Training locally through workshops, seminars, for and field demonstrations.
Biliton Bogosu Gold Limited.		Monitoring , training, safety usage, analysis and grades process controls.	National Environmental Policy and guidelines. World Bank/IFC policy and Guidelines. General policy and Guidelines programmes by EPA code of good practice in refrigeration.
Takoradi Polytechnic	Storage of Chemicals. Experiments and practical.		
Abuakwa Formulation Plant Ltd.			Chemical Formulation and Handling.
Ghana Water and Sewerage Corporation, Sunyani.			Training for new employees.
West African Mills Co. Ltd.			In-house training.

COMMENT/ANALYSIS

Lack of easily accessible instrumental service facilities, easy access to spare parts and a stable and continuous power supply as well as limited budget has rendered the highly sophisticated equipment (viz. Gas chromatographs and High Performance Liquid Chromatographs or HPLC) in such laboratories as the GAEC, useless. Under the circumstance facilities for analysing organic chemical pollutants are limited. The two laboratories with the potential to undertake quality control of chemicals (at the GSB and the GAEC) need strengthening. Other laboratories that may be available include Noguchi Memorial Institute for Medical Research, Water Research Institute(Aquatic Biology), Industrial Hygiene Laboratory (Factories Inspectorate Department). Information processing equipment is available in various institutions, but training in data management is necessary in many of such institutions.

CHAPTER 10: INTERNATIONAL LINKAGES

Ghana is endowed with abundant natural resources, which have played very important role in the agricultural and industrial development efforts of the country since attainment of independence. The former name "Gold Coast," is an indicative of a country rich in precious minerals, especially, gold.

This situation coupled with the suitable geographical position of the country, has made Ghana convenient for transit in international trade, hence the need to ensure linkages with her neighbouring countries and the international community.

The government, therefore, has keen interest in participating actively in all international fora, relating to sustainable environmental development. In this regard, Ghana, has participated in meetings of United Nations, such as United Nations Conference on Human Environment held in Stockholm in 1972, and the subsequent United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992 to take some concrete decision towards sustainable development in all countries.

With regards to chemicals management, Ghana has participated in the voluntary Prior Informed Consent (PIC) and will continue to play an active role in the deliberations of the on-going negotiation for the preparation of legally binding instrument on PIC (UNEP and FAO Joint Programme).

Furthermore Ghana will continue to participate actively in the programmes of Inter-governmental Forum on Chemical safety, Inter-organization Programme for the Sound Management of Chemicals, International Programme on chemical safety, UNIDO, WHO, FAO, ILO and others.

Ghana has signed and or ratified many conventions including Vienna Convention on the Protection of the ozone layer, Montreal Protocol on the substances that Deplete the ozone layer, Basel Conventions on the Control of Trans-boundary Movement of Hazardous Waste, Biological Diversity, and UN Framework Convention on Climate Change.

In her attempt to streamline control and manage chemicals, ensure sustainable consumption patterns and prevent adverse effect of chemicals on human health and the environment, Ghana adopted voluntary Guidelines, such as FAO Guidelines for the distribution of Pesticides in International Trade and to promulgate national Legislation on pesticides and Crop Protection and improvement of occupational health.

10.1 COOPERATION AND INVOLVEMENT WITH INTERNATIONAL ORGANIZATION BODIES AND AGREEMENTS

The linkages with International Organizations, particularly those dealing with chemicals management which the country is benefiting from include:

- receiving international support, both financial and technical, through UN agencies such as UNEP, (IRPTC), FAO, UNITAR, UNIDO and ILO, to address relevant issues on chemicals management.

- receiving relevant documents/literature and information from collaborating countries, and organizations including USEPA, UN organizations such as UNEP(IRPTC), FAO, UNITAR, UNIDO, ILO, INMO, WHO on measures/actions to take in addressing chemical management problems. In addition, enormous support is received from Donor Agencies such as DANIDA, World Bank (GEF), ODA AND IDA for the Ghana Environmental Management Project.

- receiving guidance document and information on technologies used to reduce chemical risks at the local level;

Table 10A: Membership in International Organizations, Programmes and Bodies

International Organization/Body	National Focal Point and Primary Contact Point	Ministries/Agencies	Related National Activities
Intergovernmental Forum on Chemical safety (IFCS)	Ministry of Employment & Social Welfare Contact: Mr. F. T. Bruce Director, Factory Inspectorate Department.	MEST, MLGRD, MOE, EPA, TUC and Employers Associations.	Awareness creation and National Communication on IFCS activities.
UNEP	EPA (Executive Director)	MEST, MOFA, MOTI and other line Agencies.	Registration and Control of Chemicals. Montreal Protocol, Industrial Pollution Prevention Programmes, Biodiversity, PIC (Legally binding Instrument in certain banned and restricted chemical in international trade).
IRPTC	EPA	MOFA, MEST, GSB, GAEC,	Information dissemination on chemicals management and Risk assessment.
IE/PAC Cleaner Production Technologies			Industrial Pollution Prevention Programmes.
IPCS	EPA	MEST, MOH, MOFA and other Line Agencies	Risk reduction programmes.
WHO	MOH	MEST/EPA and MESW	Epidemiological Surveys Onchocerciasis Programme (Blackfly vector control) Chemical Safety Programme, Malaria Control , Tsetesfly Control Programme.
FAO	MOFA/EPA	EPA/MEST	Safe use and disposal of agrochemicals and pesticides. Notification on PIC pesticides etc.
UNIDO	MOTI	MEST/EPA	Industrial Monitoring Pollution Prevention
ILO	MESW (Factories Inspectorate Department)	MEST, Trade Unions/Consumer Protection Association	Occupational safety at work places. ILO Conventions, Safe and effective use of chemicals.
WORLD BANK	Ministry of Finance	Line Ministries	Project Support/GERMP NEAP etc.
Regional Development Bank (ADB)	Ministry of Finance	Line Ministries	Project Support (all sorts) relating to Chemicals Management)

10.2 PARTICIPATION IN INTERNATIONAL AGREEMENTS/PROCEDURES RELATED TO CHEMICALS MANAGEMENT

Ghana has been a party to a number of international agreements as shown in Table 10 B below. The pesticides and related chemicals control and management Act (Act 528) and the EPA Act (Act 490) have played significant role in the enhancing chemicals management in the country

Table 10 B: Participation in International Agreements/Procedures Related to Chemicals Management

INTERNATIONAL AGREEMENTS	PRIMARY RESPONSIBLE AGENCY	RELEVANT NATIONAL IMPLEMENTATION ACTIVITIES
Agenda 21-Commission for Sustainable Development	Ministry of Environment Science and Technology.	Ratification of conventions on Biodiversity, Climate Change, Desertification,; EPA Implementing GERMP
UNEP London Guidelines (voluntary procedure)	Plant Protection and Regulatory Services (PPRS)	Pesticide Management, Safe and efficient use and Environmental Safety.
FAO Code of Conduct (voluntary procedure)	Ghana Atomic Energy Commission(GAEC) Plant Protection and Regulatory Services (PPRS) E.P.A.	Hosts national formulation control laboratory on national pesticides committee. Control and Management of Importation, Storage and Distribution of Pesticides
Montreal protocol	EPA	E.P.A.
ILO Convention	MESW (Factory Inspectorate Department)	Health hazards during application and handling of pesticides.
UN Recommendation for the Transportation of Dangerous Goods	Plant Protection and Regulatory Services (PPRS)	Transportation of Pesticides.
Basel Convention	E.P.A	E. P. A hosted the National task force on Toxic Waste.
GATT/WTO agreements (related to chemical trade)	Ghana Standards Board (GSB)	Pending creation of National Authority. GSB is interim.
Chemical Weapon Convention	MEST	
Regional/Sub-regional Agreements (specify)	Plant Protection and Regulatory Services (PPRS)	Sub-Regional Implementation of HIP Programme.
Bilateral Agreements (specify)		

10.3 PARTICIPATION IN RELEVANT TECHNICAL ASSISTANCE PROJECTS

The country has benefited from a number of assisted projects which have had much impact on many sectors of the economy. Others could however not materialize. Research, monitoring and training in various environmental issues have been the target of such projects.

Table: 10 C: Participation in Relevant Technical Assistance Projects

NAME OF PROJECT	OBJECTIVE/SCOPE OF PROJECT	DURATION OF PROJECT	INTERNATIONAL/ BILATERAL DONOR AGENCY INVOLVED	NATIONAL CONTACT POINT	PARTICIPATING NATIONAL ORGANIZATIONS	RELEVANT EXPERIENCE GAINED	RELEVANT ACTIVITIES
Ghana/CIDA Grains Development Project (GGDP)	To conduct research into maize and legumes to promote their production in Ghana.	17 years	Canadian International Development Agency (CIDA)	Crops Research Institute or Canadian High Commission	Grains and Legumes Development Board. Ministry of Food and Agriculture.	About 14 improved varieties of maize and legumes have been developed by CRI.	Research and Technology Transfer
Establishment of National Pesticide Formulation Laboratory	To establish Laboratory for Quality Control analysis of Pesticide Formulation.	Six years	FAO	FAO ACCRA	EPA/GAEC MOFA	Instrumental Parameters for a Number of Pesticides Worked out.	Technology Transfer

CHAPTER 11 AWARENESS/UNDERSTANDING OF WORKERS AND THE PUBLIC

The proper handling, marketing use and disposal of chemical residues in the environment at present are a great source of worry to many people in the country. That general public apathy is an indication of the fact that public awareness and understanding of chemicals and risk/hazards associated with them is generally low. Most locally manufactured goods do not carry proper labels as well as information pertaining to chemical composition, level of toxicity etc. Adequate legislative and regulatory instruments are therefore essential for effective management of chemicals in the country.

11.1. **Legal Instruments on the Awareness of Workers**

The Pesticide and Chemical Management and Control Act (Act 528) provides for sanctions for non compliance with the law. Representations from Government and Non Governmental agencies and multistakeholders were involved in the formulation of this law and regulation.
Chemical import monitoring by EPA for the past eight years has increased awareness among workers and management on the use of chemical. There is however the need to train and educate farmers, industrial workers and the general public in the handling, application of agrochemicals and other industrial chemicals.

11.2. **Awareness and Understanding by the Public**

Non Governmental Organizations like Friends of the Earth (FOE), Green Earth Organization and many others which are helping with information dissemination and awareness creation on Environmental and chemical management issues. Results are also being achieved with the involvement of Journalists on coverage of environmental issues. These activities need to be stepped up.

Journalists

Government and Private media Journalist have been identified as channels for public information on chemicals management that the general public needs to know. EPA has been involving them as participants in Workshops to create awareness. The involvement of Ghana Institute of Journalism in Ghana Environmental Resources Management Project is a pointer to this fact.

Educational Broadcasts

Materials developed by the Educational Department of EPA, GBC and others sensitize the public on environmental management. More of such materials need however to be developed.

Newspaper Features

EPA's monthly newsletter coupled with Editorials in the Daily Graphic, The Ghanaian Times and other private media provide publications on various environmental issues.

Advertisements

New FM radio stations, GBC Radio and Television broadcast on environmental topics as well as chemicals registration and regulation.

Workshops, Seminars and Meetings

Workshops organised by MEST EPA and other line Agencies helps with sharing knowledge and of expertise in the field of Environmental Management. The Educational Departments of EPA workshops for the District Environmental Management Committees on the existing Environmental laws throughout the country show the decentralization of Environmental management processes adopted.

Drama

Environmental issues such as indiscriminate dumping of garbage, discharge of effluents from factories into water bodies, fishing with chemicals, throwing of refuse on the streets etc and their impacts on the environment in general are often dramatised in schools and colleges as well as in various communities using the existing local languages and dialects. These have had significant impact in the area of awareness creation on the Ghanaian populace

CHAPTER 12: RESOURCES AVAILABLE AND NEEDED FOR CHEMICALS MANAGEMENT

The Pesticides and chemicals Control and Management Bill (Act 528) and the Act which established EPA (Act 490) have enhanced the future of sound management of chemicals in the country. The necessary machinery however needs to be put in place for effective management.

12.1 RESOURCES AVAILABLE IN GOVERNMENT MINISTRIES/ INSTITUTIONS

Professional Staff

As indicated in Table 12 A below, a good number of high level personnel are already involved in the chemicals management but a lot more are nevertheless required to enhance the activities of such ministries and institutions concerned.

TABLE 12.A Resources Available In Ministries/Institutions

MINISTRY /AGENCY	NUMBER OF PROFESSIONAL STAFF INVOLVED	TYPE OF EXPERTISE AVAILABLE	FINANCIAL RESOURCES AVAILABLE PER YEAR IN MILLION CEDIS
Ministry of Environment Science & Technology (GAEC, CSIR)	6	Analytical Chemists, Technologist, Entomologist, Plant Pathologist	44.9
Ministry of Food & Agriculture (PPRS)	91	Environmental Toxicologist, Entomologist, Technicians, Agriculturists	42.6
Ministry of Trade & Industries	11	General Knowledge in Chemistry, Environmental Scientist, Technicians, Storekeepers, Biochemists	N/A
Ministry of Mines & Energy (Geological Survey)	17	Geologists, Technicians	N/A
Ministry of Education	40	Chemists, Technicians	N/A
Ministry of Health (Medical Supply, Hospital)	11	Medical Doctors Microbiologist, Pharmacists, Dispensing Assistants, Storekeepers, Technicians	N/A
Ministry of Labour and Social Welfare	14	Administrators, Occupational Health Officers	N/A
Ministry of Roads and Transport	12	Environmental Management and Lawyers	N/A
Ministry of Finance	20	Economists Statisticians	N/A
Ministry of Interior (CEPS)	6	Chemists, Biochemists, Criminologist	N/A
Ministry of Foreign Affairs	4	International Laws and Public relations	N/A
Ministry of Justice	8	Lawyers, Jurists	N/A

Table: 12 B shows the number and type of professionals needed to embark on country-wide chemicals management exercise.

Budgetary constraints have hampered the smooth operations of institutions involved in chemicals management. In particular adequate financial resources are needed for the following:

- making instrumental service and spare-parts available to the quality control laboratory
- training of personnel in various aspects of chemicals management.

Table 12 B Resources Needed By Government Institutions To Fulfill Responsibilities Related To Chemicals Management

MINISTRY/AGENCY	EXTRA NUMBER OF PROFESSIONAL STAFF NEEDED	TRAINING REQUIREMENTS
Ministry of Environment Science & Technology/ EPA	5	Chemical disposal methods. Establishing a chemical database. Training by supplies of GCs and AAS on trouble shooting and routine maintenance of scientific equipment in stock. Periodic training in handling and storage including potency of chemicals. Laboratory management practices including handling and storage of hazardous chemicals. MDPI training in stores management.
Ministry of Food & Agriculture	66	Training in chemical use in Agriculture. Regional professional training in Agrochemicals Management and Application Technology. Quality Control and Chemical regulation Chemical storage practices/management. Training of technicians. In-country short or refresher courses needed at both middle and professional levels. Out-country short courses up to six months for both levels
Ministry of trade & Industry	2	Trade in "PIC" chemicals Harmonized system on classification and labeling, Control of import and export of chemicals
Ministry of Mines & Energy	11	Industrial toxicology, risk assessment, detoxification and poison control
Ministry of Health	12	Quality control and certification of foods and water. Risk assessment, detoxification and poison control
Ministry of Education	4	B.Sc and M.Sc programmes, HND courses, In service training, Laboratory Assistant courses
Ministry of Labour & Social Welfare	6	Industrial toxicology, hygiene and medicine , risk assessment
Ministry of Roads & Transport	5	Registration of marine vessels, emergency response, transport of dangerous goods
Ministry of Finance	5	Trade in "PIC" chemicals Harmonized system on classification and labeling, Control of import and export of chemicals
Ministry of Interior	7	Environmental law and enforcement. Drug trafficking preparedness
Ministry of Foreign Affairs	8	Environmental law, trade in chemicals used in warfare
Ministry of Justice	4	Environmental law , trade in chemicals used in warfare

ANNEX 1: DISTRICT MAP OF GHANA

ANNEX 2: MAP OF GHANAIAN LANGUAGES

MEMBERS OF THE NATIONAL COORDINATION TEAM

NAME	ADDRESS
1. DR. P.C. Acquah (National Coordinator)	Environmental Protection Agency
2. Mr. G. M.S. Klufio (Programme Coordinator)	Environmental Protection Agency
3 Mr. Sam Adu-Kumi (Rapporteur)	Environmental Protection Agency
4. Mr. Frank Boakye Antwi (Rapporteur)	Environmental Protection Agency
5. Mrs. Shirley M. Otinkorang (Rapporteur)	Environmental Protection Agency
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Glossary

Agricultural Chemical refers to a chemical compound or mixture produced exclusively for the sole purpose of increasing/improving the productivity and quality of farm crops, inclusive of all fertilizers and pesticides.

Chemical is any organic or inorganic substance of a particular molecular identity, including

(i) any combination of such substances occurring in whole or in part as a result of a chemical reaction or occurring in nature, and

(ii) any element or uncombined radical.

Consumer Chemical refers to any industrial chemical whose products are meant for the direct or immediate use by the consumer public, particularly for such areas as household cleaning, hygiene, water treatment etc. and are usually stable under normal conditions of temperature and pressure.

Formulation means the combination of various ingredients designed to render a product useful and effective for the purpose claimed; the form of the chemical as purchased by users.

Environmental Impact Assessment refers to a process to improve decision-making to ensure that options under consideration are environmentally and socially sound and sustainable. It is concerned with identifying, predicting and evaluating the foreseeable impacts both beneficial and adverse of public and private development initiatives, taking into consideration alternatives and mitigating measures with the aim to eliminate or minimize impacts and optimize positive impacts.

Industrial Chemical means large scale commercially manufactured chemical compound, either organic or inorganic, which may be used directly or made to undergo further transformation in the production of detergents, drugs, fertilizers, perfumes, plastics and other synthetic finished chemical products, i.e. substance may act as an inhibitor, catalyst, or preservative.

License means an official document that authorizes/allows corporations and/or individuals to undertake operations dealing in chemicals or related activities issued under appropriate sections of the EPA Act 490 and Act 528.

Permit means an official written order issued to a developer, company, institutions, etc. or an individual intended to undertake an activity and accompanied with rules and guidelines on how to proceed, which, following assessment and consultation among concerned parties, it has been ascertained that, the risks to which living things and the physical environmental are exposed could be tolerated, in the course of undertaking in accordance with appropriate sections of the EPA Act 490.

Pesticide means any substance or mixture of substances intended for the prevention, destruction or control of any pest, embracing vectors of human or animal disease, unwanted species of plants and animals causing harm during or otherwise interfering with the production, processing, storage, transport or marketing or food, agricultural commodities, wood and wood products or animal feed stuffs. The term also includes substances intended for use as a plant growth regulator, defoliant and dessicant.

Pollution prevention means the sum total of all interventions and techniques employed to maintain, at the lowest levels, the quantities of possible contaminants in a particular environment such that the probability of the occurrence of pollution to human, animal, and plant life is minimized or totally inhibited.

Production refers to all activities concerned with the manufacture/production of goods and/or services.

Rural refers to human settlements with population size less than 5000 persons.

Trade means engagement in trade (buying and selling of commodities), including exports, import, formulation and domestic distribution.

Urban refers to human settlements with at least 5000 persons.

ACRONYMS

1. AGI	Association of Ghana Industries
2. CEPS	Customs, Excise and Preventive Service
3. CRIG	Cocoa Research Institute of Ghana
4. CSIR	Council for Scientific and Industrial Research
5. DANIDA	Danish International Development Agency
6. EPA	Environmental Protection Agency
7. ERP	Economic Recovery Programme
8. FAO	Food and Agriculture Organisation
9. FID	Factories Inspectorate Department
10. FLS	Front Line Staff
11. FOE	Friends of the Earth
12. GAEC	Ghana Atomic Energy Commission
13. GBC	Ghana Broadcasting Corporation
14. GDHS	Ghana Demographic and Health Survey
15. GDP	Gross Domestic Product
16. GEF	Global Environmental Facility
17. GERMP	Ghana Environmental Resource Management Project
18. GLP	Good Laboratory Practice
19. GLSS	Ghana Living Standards Survey
20. GNPC	Ghana National Petroleum Corporation
21. GSB	Ghana Standards Board
22. GSC	Ghana Supply Commission
23. GSS	Ghana Statistical Service
24. ICMIS	Integrated Chemicals Management Information System
25. IDA	International Development Agency
26. IFCS	Intergovernmental Forum on Chemical Safety
27. ILO	International Labour Organisation
28. IPCS	International Programme on Chemical Safety
29. IRPTC	International Register for Potentially Toxic Chemicals
30. LD	Labour Department
31. MEST	Ministry of Environment, Science and Technology
32. MOE	Ministry of Education
33. MOFA	Ministry of Food and Agriculture
34. MOH	Ministry of Health
35. MSDS	Material Safety Data Sheet
36. MRT	Ministry of Roads and Transport
37. MTADP	Medium Term Agricultural Development Prgramme
38. MTTU	Motor Traffic and Transport Unit
39. NPC	National Population Council
40. ODA	Overseas Development Agency
41. OECD	Organisation for Economic Corporation and Development
42. PAH	Poly Aromatic Hydrocarbons
43. PIC	Prior Informed Consent
44. PPRSD	Plant Protection and Regulatory Services Department

45. RCC	Regional Coordinating Councils
46. SMS	Subject Matter Specialists
47. TOR	Tema Oil Refinery
48. UNCED	United Nations Conference on Environment and Development
49. UNEP	United Nations Environment Programme
50. UNIDO	United Nations Industrial and Development Organisation
51. UNITAR	United Nations Institute for Training and Research
52. USEPA	United States Environmental Protection Agency
53. WHO	World Health Organisation