

NATIONAL CHEMICAL
PROFILE OF



GUYANA

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PREFACE

In view of the recognition by the Government of Guyana of the essential need for acceptable regulatory management of chemicals in Guyana, the Pesticides and Toxic Chemicals Control Board (PTCCB) has developed this National Chemicals Management Profile (NCMP) to guide the importation, storage, trade, usage by the diverse spectrum of end users.

This document has been compiled through a consultative approach led by the PTCCB and involving pertinent local public and private sector agencies and relevant overseas based regional and international organizations which are directly involved in chemical management and usage and monitoring.

The Profile has been prepared in conformity with Government's deliberate policies associated with the safe usage of chemicals especially insofar as residual effects are concerned while taking note of the socio-economic importance of the need for chemical applications particularly in the agriculture, manufacturing and mining sectors.

There has been consensus among the consulting stakeholders that this Chemical Profile is a very comprehensive document which is reflective of the legislative and administrative provisions, as well as international agreements/protocols associated with chemical usage. Accordingly, it must be seen by all of the relevant stakeholders as a critical instrument to be consulted with towards ensuring that the principles enshrined therein are duly considered insofar as the importation, storage, trade, usage of chemicals in accordance with the commonly acceptable chemical management standards are concerned.

It is expected that this NCMP, which will be continuously updated as a work in progress in cognizance of new international and local developments. This will, consequently, lead to the development of a National Strategies Approach for International Chemical Management SAICM Implementation Plan which will be implemented in a systematic and timely manner. With this in mind, the entire network of importers, manufacturers and distributors and end-users must never lose sight of the need to continue to work with the PTCCB in furtherance of achieving chemical management in of the highest values in Guyana. To this end the Government of Guyana will maintain its focus of providing the relevant legislative and administrative support.

**Robert M. Persaud, MBA., MP.,
Minister of Agriculture,
1st February 2010.**

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INTRODUCTION

The Strategic Approach for International Chemical Management (SAICM) is a policy framework for international action on chemical hazards with its overall objective being the sound management of chemicals. The Overarching Policy Strategy (OPS) of SAICM indicates that implementation of SAICM could begin with an enabling phase to build the necessary capacity to develop, with stakeholder participation, a national SAICM implementation plan.

The United Nations Environmental Programme (UNEP) - acting on a resolution decided during the International Conference on Chemicals Management (ICCM) - has established the Quick Start Programme (QSP) for the implementation of the Strategic Approach Objectives.

The QSP builds upon the outcomes of the ICCM and the Bali Strategic Plan for Technology Support and Capacity building and aims to support initial enabling capacity building and implementation activities in developing economies.

Guyana developed a Project proposal with the assistance of the United Nations Institute for Training and Research (UNITAR) for funding under the QSP Trust Fund. The Project **“Developing an Integrated National Programme for the Sound Management of Chemicals and SAICM Implementation in Guyana”** was approved by the Trust Fund.

This project seeks to formally establish an interagency committee as well as making an assessment of the chemical management situation in Guyana by developing a National Chemicals Management Profile. In addition, through the project, Guyana aims to identify existing gaps among government agencies, business and industry, and public interest and labour organizations, and to identify and present their respective priorities. This identification will lead to the development of action plans to address these issues leading to the development of a National SAICM Implementation Plan to implement the Global Plan of Action in a systematic and timely manner.

This National Profile of Chemicals Management has been prepared as a key component of the enabling phase for Guyana towards implementation of the Strategic Approach. Additionally, it is hoped that this Profile will facilitate greater understanding of the functioning, strengths and weaknesses of the Guyanese chemicals management framework.

The guidance document “Preparing a National Profile to Assess the National Infrastructure for Management of Chemicals” and its accompanying supplementary guidance note, both prepared by the United Nations Institute for Training and Research (UNITAR), were invaluable aids in the completion

of the Profile. Under the aegis of the National Coordinating Team, the preparation process was at every stage informed by the recommendations and principles outlined in the UNITAR guidance documents along with other doctrines and directions provided by the UNITAR Secretariat.

In keeping with this document, this project focuses primarily on the development of a National Chemicals Management Profile (NCMP), with one of the major outcomes being a comprehensive assessment of the chemical management situation in Guyana. This Chemical Profile is the first part of the Project

The NCMP will provide information on the chemical industry and trade in Guyana.

The project involves examination of the legislations related to chemical management and the authorities associated with such management.

Upon completion, a major outcome of the comprehensive assessment will be the determination of common priorities and opportunities for specific multi-Agency projects involving government and other stakeholders with the objective of capitalising maximally on the said shared priorities while taking advantage of the existing opportunities.

EXECUTIVE SUMMARY

Conventional agricultural methodologies in Guyana, use a wide range of agricultural chemicals to improve the yield and quality of produce and to control weeds, insect pests and diseases. While recognizing the important role these chemicals play, relevant authorities and the users should be mindful that there are increasingly concerns with the level of chemical residues in produce which could have deleterious effects on consumers.

The main concern is when chemical residues are detected at unacceptable levels, as this may impact on human health and marketability of the product(s). Should produce contain residues above established acceptable levels, this could have serious repercussions for domestic and international trade.

Managing chemical residues, with specific focus on Good Agricultural Practice (GAP) is essential at the national level, Growers are responsible for ensuring that chemicals are used correctly to minimize any chance of unacceptable chemical residues occurring.

In acknowledgment of the need for a national comprehensive strategy to guide effective chemical management, the Pesticides and Toxic Chemicals Control Board (PTCCB) launched a project specifically to initially develop a National Chemicals Management Profile (NCMP). This involved conducting in-depth analyses of the pertinent issues pertaining to the legal provisions, responsible public and private sector organisations, and chemical importation storage, sale and usage in accordance with international best practices. The main objective of the Project is the documentation of a comprehensive evaluation of the chemical management situation in Guyana.

In addition, the project aims to perform a capacity assessment by identifying existing gaps among government agencies, business and industry, and public interest and labour organizations, and to represent their respective priorities along with the development of action plans to address these issues. These action plans is the main component of the development of a National SAICM Implementation Plan to implement the Global Plan of Action in a systematic and timely manner.

Fundamentally, the NCMP will provide information on the chemical industry and trade in Guyana. The Project focussed mainly on (i) identify existing, capacities, gaps and jeopardies between the respective government agencies and business organisations within the industry, and (ii) public interests and the principles of labour organizations with the view to identify and document their individual priorities. The identification of such capacities, gaps, jeopardies and priorities will lead to the development of suitable action plans to address these issues. This will lead to the development of a National

Strategies Approach for International Chemical Management SAICM Implementation Plan which will be implemented in a systematic and timely manner.

Another major component of the Project is the determination of common priorities and opportunities for specific multi-Agency projects involving government and other stakeholders with the objective of capitalising maximally on the said shared priorities while taking advantage of the existing opportunities.

This Profile on Guyana's chemical industry and trade was compiled to aid the development of a National Implementation Plan for Chemical Management. The document provides a country profile which describes Guyana's social and geographical characteristics, and including (i) information on the population, (ii) an outline of the economy, and (iii) a brief descriptions of the country's major sectors.

Guyana's chemical industry is represented by a network of importers, manufacturers and distributors. The PTCCB - a Statutory Government Agency, regulates importation and exportation of chemicals. The latter is done within the scope of Chemical production in Guyana being minimal and mainly limited to paints, soap and detergents and pharmaceuticals for local consumption. The Board also regulate chemical storage facilities, and the transportation of chemicals in excess of one hundred litres.

Chemicals enter Guyana as raw materials, intermediaries and finished products, mainly to meet the needs of gold and bauxite mining, paint production, agricultural industries and manufacturing of industrial and domestic cleaning compounds.

There are twelve storage bonds or holding facilities for chemicals in Guyana, and one for electrical equipment which contains Poly Chlorinated Biphenyls (PCB). However, none of these can facilitate the storage of bulk chemicals. Also, there is no transportation facility specifically for movement of chemicals to other countries or for local long distance haulage.

In Guyana, there are no waste disposal or treatment facilities for chemicals and chemicals related waste. Obsolete chemicals are stored in a sealed secured bond. However, disposal of chemicals from households is done in an ad hoc manner and is not monitored. It is not unusual for waste from the manufacturing sector to be disposed of in waterways when internal storage containers are full.

There is currently no known occurrence of import of chemical waste but used lead acid batteries are exported to various countries as hazardous waste. The

Environmental Protection Agency (Guyana) is currently assessing a hazardous waste strategy for implementation.

There is no inventory for unintentionally generated chemicals arising out of the incineration of waste, power generation and heating, transportation, disposal and land filling. Guyana is in the process of approaching the Global Environmental Facility, for developing a National Implementation Plan for the implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) which would incorporate inventories that will provide this type of information.

The lack of accurate data prohibits the prioritisation of the concerns relating to chemical production, trade, use, waste generation and disposal in Guyana. However, an attempt was made via the National Consultation on Chemicals Management Workshop (July, 2009) to prioritise the need for data collection pertaining to chemical management.

The analyses have revealed that there is the need for reporting procedures on chemical recovery operations to be established and that more health and safety inspections relating to chemical use and handling is required.

There are seventeen pieces of key legislation addressing the management of chemicals, wholly or partially, in Guyana. These legislation are enforced selectively by the PTCCB, Ministry of Labour, the Food and Drug Department of the Ministry of Health, the Guyana Geology and Mines Commission, the Guyana Energy Agency, the Ministry of Home Affairs, the Environmental Protection Agency, and the Ministry of Trade. Generally, the overlapping or responsibilities is resolved through appropriate of Memoranda of Understanding between or among the relevant Agencies. However, enforcement of existing legislation is often difficult because of a number of some mitigating factors such as limited human resources and budgetary constraints.

The Control of chemicals is heavily reliant on the prohibition or restriction of importation and manufacture. Pharmaceuticals, ozone depleting substances and pesticides are mostly subjected to this type of control.

The existence of Inter-ministerial bodies and Standing Committees allow for attaining inter-agency cooperation for conducting chemical management activities. However, two inherent problems are associated with such bodies i.e. prolonged periods of inactivity and reduced information sharing. The establishment of the PTCCB has eliminated the need for either body to be used. The Board is vested with the legal authority to establish Committees to address chemical management issues if it feels that it is not in possession of the required capabilities to unilaterally pursue such issues.

There is adequate qualitative and quantitative data available on pesticides, industrial chemicals, consumer chemicals and chemical waste to fulfil the information needs of national chemicals management in Guyana. This information is spread throughout a number of Agencies and some can only be accessed by written requests. It must be noted that the currency of the data is unknown at this point in time, and the format in which it is documented varies among the respective Agencies.

Pesticides and toxic chemical information is collected through mandatory submissions made by importers. National information on chemical management is circulated among Government Ministries and other Statutory Government Institutions using an ad hoc system for exchange of information.

There are a number of laboratories within Guyana, most of which have been accredited by the local accreditation body i.e. the Guyana National Bureau of Standard. The Pesticides and Toxic Chemicals laboratory is the only Statutory Organisation with the potential to fully support a national chemical management programme. The other laboratories involved with chemical management were set up to meet specific needs and are less likely to perform tasks outside of their mandate. The harmonisation of the functions and capabilities of all these laboratories will enhance national chemical management.

Governmental institutions in Guyana possess staff with a variety of expertise relative to chemical management. However, understaffing contributes to inadequate chemical management within some institutions. In view of this situation, there is the need for institutional capacity building and strengthening within the respective Governmental Institutions, especially pertaining to the regulatory and emergency response aspects of chemical management especially in the areas of chemical safety; poisoning prevention and treatment; environmental management; toxicology; epidemiology; risk analysis; logistics; conventions and international agreements; and socioeconomic and policy analysis.

Further professional development is also needed to support national chemical management. Locally, the University of Guyana could offer study courses on this subject with assistance from International Organisations like the United National Environment Programme (UNEP) and the Stockholm Convention. Currently, most government analytical facilities obtain their technical capabilities through initial training from the suppliers of the relevant equipment and from internal skills development programmes. Specifically, the Pesticides and Toxic Chemicals Control Board has the information technology capability to develop information systems, databases and inventories, and to access international information databases.

In the absence of a national chemical emergency preparedness, response and follow-up plan, the conduct of investigations of chemical incidents varies according to the responsible agencies. The investigations usually lead to prompt follow-up activities and formal enquiries pertaining to the cause(s) being made of the responsible parties. Harmonisation of the various coordinating mechanisms associated with national chemical emergency response and preparedness will improve chemical management significantly. Such harmonisation could generate more simulation exercises, a dedicated communication system for faster incident status updates and the establishment of specific medical facilities to treat chemically exposed individuals.

In the area of public awareness, governmental and non-governmental organisations independently employ a range of communication strategies such as print publications, television and radio programmes, exhibitions and seminars, to raise the awareness and understanding of workers and the public in general about chemical management issues.

The PTCCB is active in the training of farmers, extension agents, vendors, students, pest control operators and Customs and Trade Administration Officers throughout Guyana. In so doing, focus is centered on pesticide related topics with relevance to agricultural practices. The Board also raises public awareness through the development and distribution of training manuals and the publication of a quarterly newsletter. Further, the Board participates frequently at national exhibitions and television programmes featuring agriculture issues, in addition to hosting website with a comprehensive range of topics pertinent to its mandate.

Guyana is a party to several international chemical agreements. Further, the PTCCB is a member of the Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC), which has adopted the Food and Agriculture Organisation's International Code of Conduct on the Distribution and Use of Pesticides. These linkages offer access to technical assistance, pertinent information and potential funding. Unfortunately, these possibilities are not always fully exploited because chemical management may not be the priority of the international body or the focal point of the relevant local agency.

This NCMP seeks to provide a comprehensive strategy aimed at promoting the management of chemicals in Guyana within the legal and administrative framework which would result in consumer and consumer and environmental protection, and by extension, growth in domestic and international trade. The Profile is a work in progress and will be continually updated based on advancement in chemical research and development and new domestic and international policies associated with chemical management. This document will be of invaluable use as research tool and as a guide to importers, sellers and users of chemical in Guyana.

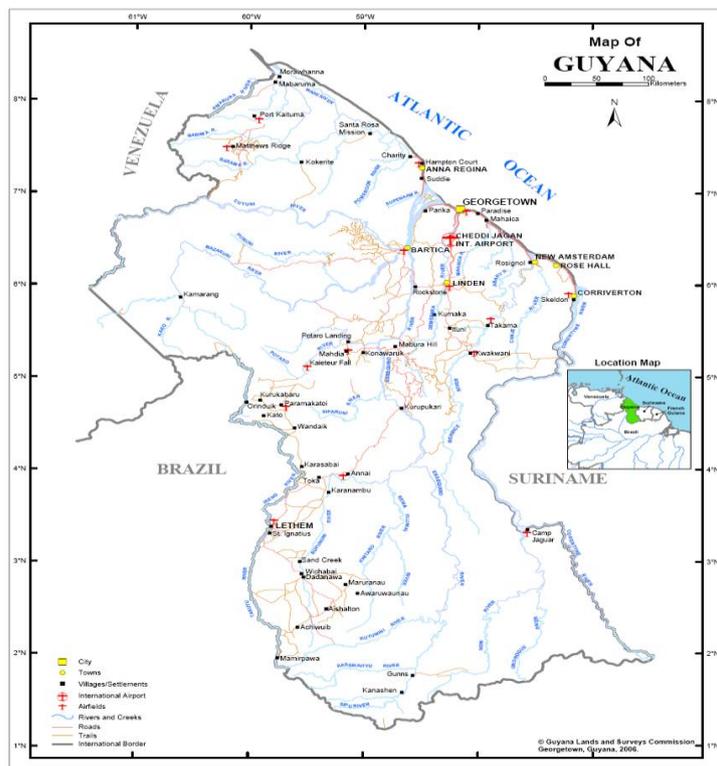
The examination and development of this NCMP has led to the conclusion that the overall legislative infrastructure for the management of chemicals in Guyana is adequate but some areas needs strengthening for effective implementation. The Profile also concluded that a more dynamic public awareness programme on chemical safety is required and this programme should be a cooperative effort between civil society, the private and public sector agencies.

The recommendations arising from the NCMP were made to improve the management of chemicals in Guyana and include identification of a mechanism for coordination and cooperation among the various agencies managing chemicals and for the institutionalization and broaden to cover the life cycle of chemicals.

CHAPTER 1

NATIONAL BACKGROUND INFORMATION FOR GUYANA

This chapter provides a brief summary of the physical, demographic, political and economic conditions in Guyana at the national and regional levels.



Guyana is a country in Northern South America and part of Caribbean South America, bordering the North Atlantic Ocean with a 430 kilometre coastline on the northeast. Guyana is bounded by Venezuela on the west, Brazil on the west and south, and Suriname on the east. The land area of the country is approximately 214,970 square kilometres and is situated between 10° &

9° North Latitude and 57° & 61° West

Longitude (Bureau of Statistics, Guyana).

Guyana, an Amerindian word meaning “land of many water” is a water-rich country. Numerous rivers flow into the Atlantic Ocean, generally in a northward direction. A number of rivers in the western part of the country, however, flow eastward into the Essequibo River, draining the Kaieteur Plateau. The Essequibo, the country's major river, runs from the Brazilian border in the south to a wide delta west of

Table 1 - Guyana at a Glance

Population	751,223 (Census 2002)
Size	214,970 square km
Location	Between 1° & 9° North Latitude and 57° & 61° West Longitude
Time Zone	GMT - 04:00
Currency	Guyana Dollar (G\$)
Per capita GDP (2008)	US\$1,233.60
Nominal GDP (2008)	G\$190,728 million
Real GDP (2008)	G\$6,253 million
Inflation Rate	Dec '07-Dec '08: 6.4
	Dec '08-Mar '09: 0.4
	Jan '09: 3.1
	Feb '09: -2.5
Average Exchange Rate (Mid Rate)	Mar '09: -0.1
	Jan-Dec '08: G\$ 201.89 to US \$1
	Mar '09: G\$ 202.44 to US \$1
	Apr '09: G\$ 201.96 to US \$1

Georgetown. The rivers of eastern Guyana cut across the coastal zone, impeding east-west travel to some extent and provide limited access to inland locations.

In general, waterfalls restrict water transport to the lower reaches of the rivers. Some of the waterfalls are spectacular; for example, Kaieteur Falls on the Potaro River drops 226 metres, more than four times the height of Niagara Falls.

Drainage throughout most of Guyana is considered inadequate in many areas while river flow in most cases is sluggish because the average gradient of the main rivers is only one meter for every five kilometres.

Swamps and areas of periodic flooding are found in all but the mountainous regions.

All new land projects require extensive drainage networks before they are suitable for agricultural use. The average square kilometre on a sugar plantation, for example, has six kilometres of irrigation canals, eighteen kilometres of large drains, and eighteen kilometres of small drains. These canals occupy nearly one-eighth of the surface area of the average sugarcane field. Some of the larger sugar estates have more than 550 kilometres of canals; Guyana has a total of more than 8,000 kilometres of drainage canals.

Georgetown, Guyana's capital and Guyana's only city, is below sea level and depends on dikes for protection from the Demerara River and the Atlantic Ocean.

Geographical Zones

The land mass of Guyana comprises four main geographical or natural zones: the low coastal plain, the hilly sand and clay regions, the interior savannahs and the highland region.

Low Coastal Plain

The low coastal plain, which occupies about 6% of the country's area, is home to more than 90% of Guyana's population. The plain ranges from five to six kilometres wide and extends from the Corentyne River in the east to Point

Playa in the northwest and borders the Atlantic Ocean, a seaboard of approximately 430 kilometres with a width variance of 16 – 64 kilometres.

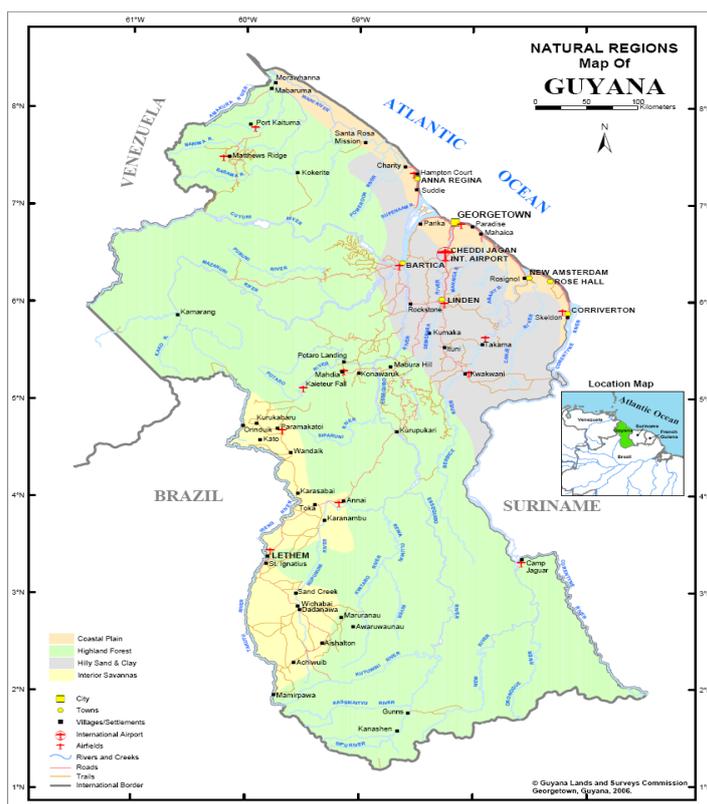
The low coastal plain is made up largely of alluvial mud swept out to sea by the Amazon River, carried north by ocean currents, and deposited on the Guyanese shores. A rich clay of great fertility overlays the white sands and other clays formed from the erosion of the interior bedrock and carried seaward by the rivers of Guyana. Historically, due to flooding of the coastal plain during high tides, efforts to dam and drain this area have been ongoing since the 1700s.

Guyana has no well-defined shoreline or sandy beaches. Approaching the ocean, the land gradually loses elevation until it merges with many areas of marsh and swamp. Seaward from the vegetation line is a region of mud flats, shallow brown water, and sandbars. Off New Amsterdam, Berbice, these mud flats extend almost twenty-five kilometres (outwards or along the shoreline?). The sandbars and shallow water, being major impediments to shipping, results in incoming vessels having to unload parts of their cargoes offshore in order to reach the docks.

A line of swamps forms a barrier between the white sandy hills of the interior and the coastal plain. These swamps, formed when water was prevented from flowing onto coastal croplands by a series of dams, serve as reservoirs from which water could be accessed during periods of drought.

Hilly, Sand and Clay Region

The white sand belt lies south of the coastal zone and takes up approximately 25 % of the country's area. This area is 150 to 250 kilometres wide and consists of low sandy hills interspersed with rocky outcroppings. The white sands support a dense



hardwood forest. These sands cannot support crops, and if the trees are removed erosion is rapid and severe. Most of Guyana's reserves of bauxite, gold, and diamonds are found in this region.

Interior Savannahs

The interior savannahs account for almost 6% of the country's area and is vegetated mostly by grasses, scrub and low trees. The human population is largely of the indigenous peoples living mostly in remote villages, with Lethem being the only town.

Much of the interior savannahs, as the name suggest, consist of grassland. The largest expanse of grassland, the Rupununi Savannah, covers about 15,000 square kilometres in southern Guyana. This savannah also extends far into Venezuela and Brazil. The Rupununi Savannah is split into northern and southern regions by the Kanuku Mountains. The sparse grasses of the savannah in general support only grazing. Amerindian groups engage in agricultural cultivation in a few areas along the Rupununi River and at the foothills of the Kanuku Mountains.

Interior Highlands

The largest of Guyana's four geographical regions is the interior highlands, a series of plateaus, flat-topped mountains, and savannahs that extend from the white sand belt to the country's southern borders and covers approximately 63 % of the country. The Pakaraima Mountains dominate the western part of the interior highlands. In this region are found some of the oldest sedimentary rocks in the Western Hemisphere. Mount Roraima, on the Venezuelan border, is part of the Pakaraima range and, at 2,762 metres, is Guyana's tallest peak. Farther south lies the Kaieteur Plateau, a broad, rocky area about 600 metres in elevation; the 1,000-metre high Kanuku Mountains; and the low Acarai Mountains situated on the southern border with Brazil.

Administrative Regions

In addition to the four natural regions, Guyana has ten Administrative Regions in keeping with legislation enshrined in the Constitution of Guyana. Some regions are divided into sub-regions, while others are divided into Neighbourhood Democratic Councils for the purpose of facilitating local governance.

The primary purpose of this division is to provide Guyanese with the opportunity to work for, and share in, the economic well-being of the respective Administrative Regions throughout the country. Guyanese are empowered to be involved in every stage of development, such as decision-making, planning and implementation. This is meant to create confident, self-reliant and productive communities managing their own affairs. These independent administrative bodies perform functions in accordance with the associated policy decisions of the central government. The ten Administrative Regions are as follows:

BARIMA-WAINI - REGION I

The **Barima - Waini** region got its name from its two main rivers. The region is predominantly forested highland, bordered at the north by a narrow strip of low coastal plain.

Approximately 18,590, who live mainly in Amerindian settlements, inhabit Region One.

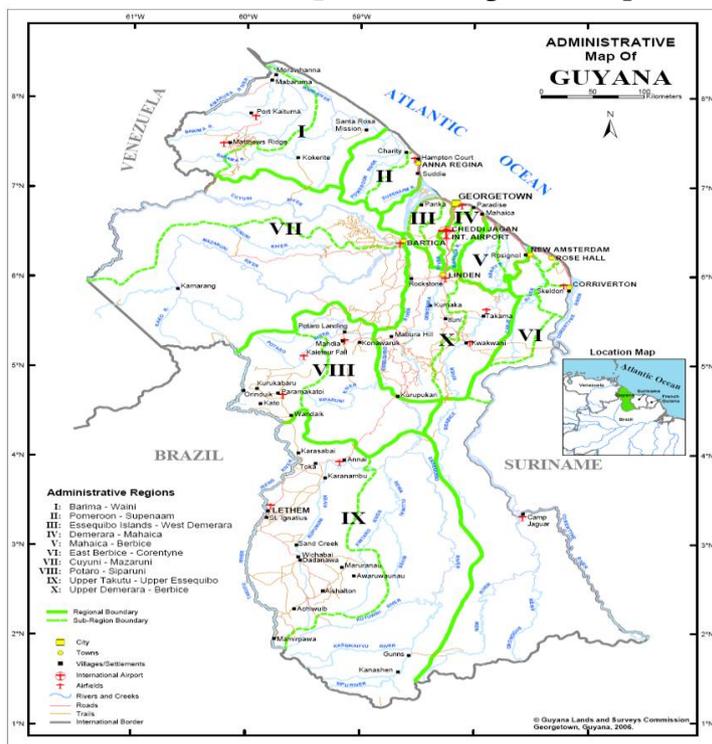
Logging is this Region's main economic activity. The largest logging operation is run by the Barama Company, which transports timber to Demerara to be processed into plywood. Many smaller timber operations exist in this Region, since the tropical rainforest yields vast amounts of many species of hardwood and other useful types of lumber.

Mining for gold and diamond is also done in some of the forested areas, mostly with the use of dredges.

The coast of Region One is known for its beaches, particularly Shell Beach, the only beach in the world to host four species of sea turtles, including the "Giant Leatherback" (the world's largest turtle), during their nesting period i.e. March to July each year. Among the sea turtles which visit Shell Beach is the "Olive Ridgley" which is almost extinct. The Scarlet Ibis, the national bird of Trinidad and Tobago, is also a common sight on this beach.

POMEROON-SUPENAAM - REGION II

The Pomeroon - Supenaam Region comprises forested highland and low



coastal plain, in addition to a small portion of the hilly sand and clay region.

Approximately 42,769 people of this region live in established villages concentrated along the coast and in some Amerindian settlements. The town of Anna Regina, on the west bank of the Essequibo River, grew out of a government land development scheme and

is made up of former plantations including Henrietta, Lima and La Belle Alliance.

The Tapakuma Project in this Region links the Tapakuma, Reliance and Capoey lakes into one large conservancy, which supplies irrigation water for rice cultivation, this being the dominant agricultural/economic activity in Region Two.

Besides rice farming, some people cultivate coconuts and rear beef and dairy cattle. Timber production is conducted on a very small scale in this region.

ESSEQUIBO ISLANDS-WEST DEMERARA - REGION III

The Essequibo Islands-West Demerara Region is made up of the islands in the Essequibo River such as Leguan, Hogg Island and Wakenaam, and the Western portion of mainland Demerara. It is made up of low coastland, hilly sand and clay, and a small portion of forested highland regions.

This Region has a population of approximately 91,328 people who live in established villages along the coastland. There is large scale rice and sugar

cultivation in this Region with coconut cultivation being done to a minimal extent.

The Boerasirie Extension Project converted the Boerasire Conservancy and the Canals Polder Conservancy into a single reservoir, thus resulting in thousands of hectares of land suitable for farming being reclaimed. The water from the conservancy is used during the dry seasons for irrigation purposes. Beef and dairy farming is also being done on a small scale commercial basis.

DEMERARA-MAHAICA - REGION IV

The Demerara-Mahaica Region extends east of the Demerara River to the Western bank of the Mahaica River, and is predominantly low coastal plain, with a small portion of the hilly sand and clay region further inland.

The population is concentrated along the coastland, particularly in Georgetown, Guyana's capital city, which has a population of approximately 56,095. The population of Region Four is approximately 297,162, are concentrated in this Region, especially in and around Georgetown. Guyana's administrative and commercial activities

There are many sugar estates, such as Diamond, Enmore and La Bonne Intention (LBI), owned and operated by the Guyana Sugar Corporation (GUYSUCO). Some residents of this region work on coconut plantations, while many engage in cash crop farming. Cattle are reared in small amounts for beef and dairy purposes.

MAHAICA-BERBICE - REGION V

The **Mahaica-Berbice** Region extends east of the Mahaica River to the west bank of the Berbice River. A large part of the region is low coastal plain. Further inland lie the Intermediate Savannahs and hilly, sand and clay region.

The population of Region Five is approximately 49,498.

Rice farming is the main economic activity of this region, followed by sugar cultivation, coconut farming, and beef and dairy cattle ranching. The Region has a water conservancy project aimed at improving the drainage and irrigation of the area. Massive dams were erected across the headwaters of the Mahaica, Mahaicony and Abary Rivers to prevent flooding of the farmlands,

being drained by them, during the rainy seasons. During the dry seasons, the dams are opened to allow the lands to be properly irrigated.

Amerindians living in inland settlements engage in the production handicraft items e.g. nibbi furniture, tibusiri baskets, which they sell to earn their living.

EAST BERBICE-CORENTYNE - REGION VI

The **East Berbice-Corentyne** Region is the only one to include parts of all the four natural geographic regions i.e. coastal plain, intermediate savannah, hilly and sandy clay area and forested highland. It is also the only Region with three towns i.e. New Amsterdam, Rose Hall and Corriverton. The population of the Region is approximately 142,839.

This Region, an important rice-producing, cattle-rearing and sugarcane-producing area, is very difficult to drain and irrigate. Because of this, the Torani Canal was dug to join the Berbice River and the Canje Creek thereby providing adequate water supply for irrigating the agricultural lands.

The area of Black Bush Polder, which was formerly a large swamp, was established through a land development scheme. The Government of Guyana gave people land for housing and for cultivating rice and cash crops.

Herds of cattle are reared for beef and dairy in the Intermediate Savannahs. Many of the other resources of this Region are not fully exploited. Logging is only conducted on a small scale, although the seasonal and montane forests of this Region can yield a variety of timber.

CUYUNI-MAZARUNI - REGION VII

The **Cuyuni-Mazaruni** Region contains two of the four natural regions i.e. forested highlands and a small portion of the hilly sand and clay region.

This Region brings to mind the majestic Pakaraima mountain range. Mount Roraima (2,810 metres high, standing at the point where Guyana, Brazil and Venezuela meet) and Mount Ayanganna are in this mountain range.

Most of the (approximately) 15,342 people living in this Region are involved in mining for gold and diamonds.

There are eight Amerindian settlements in the Pakaraimas area. The inhabitants of these settlements grow crops which they use internally as well as to supply the gold and diamond mining operations in the Region.

POTARO-SIPARUNI - REGION VIII

The **Potaro-Siparuni** Region gets its name from the Potaro and Siparuni Rivers, which are tributaries of the Essequibo River.

Predominantly forested highland with a small portion of hilly sand and clay, this Region is home to the famous Kaieteur and Orinduik Falls. The Kaieteur is one of the highest single-drop waterfalls in the world, and it is one of the premier tourist attractions in Guyana.

The people of this region, merely 5,737 in approximation, are involved in gold and diamond mining and forestry. Mazda Mining Company Ltd has the largest mining operation in this Region.

The Iwokrama Rainforest Project is partly located in this Region. This Project studies how the rainforest can be utilised in the country's development (e.g. timber extraction) without the forests being depleted or destroyed.

UPPER TAKUTU-UPPER ESSEQUIBO - REGION IX

The Kanuku and Kamoia highlands and the vast Rupununi savannahs make up the **Upper Takutu-Upper Essequibo** Region. The forested Kanuku Mountains divide this Region in two. The north savannahs are about 2,000 square miles in area, and the south savannahs are 2,500 square miles.

The population of approximately 15,087 people lives in scattered Amerindian villages and land settlement schemes.

The Rupununi, because of the grassy savannahs, is considered to be 'cattle country'. Most of the cattle are farmed to produce beef, while a small percentage is reared for milk. There exist large ranches at Aishalton, Annai, Dadanawa and Karanambo. Much of the beef produced here is sold in neighbouring Brazil, because transportation cost to the other Regions of Guyana, especially Region Four, is very expensive.

The people of this Region also mine semiprecious stones among the foothills of the Kamoia Mountains and among the Marundi Mountains. A wide variety

of handicraft is produced in many of the seventeen Amerindian villages, and sold mainly to Brazil.

UPPER DEMERARA-UPPER BERBICE - REGION X

The inland region of Upper Demerara-Upper Berbice contains the largest portion of the hilly sand and clay area. Guyana's principal bauxite deposits are found in the White Sands area.

Approximately 39,106 people who inhabit this Region work mainly with bauxite companies, Linmine (at the Linden and Ituni locations) and Bermine (at the Everton and Kwakwani locations). The extracted bauxite is exported to be processed into aluminium.

A small portion of the Iwokrama Rainforest Project is located in this Region. Cattle-rearing and forestry are also done on very small scales.

Language

The official language in Guyana is English, which is spoken mostly with a creole flavor. It is the language of education, commerce and government. Hindus and Moslems ritually use Hindi, Urdu and Arabic. The majority of Amerindians in the hinterland still adhere to one or more of the nine recognised tribal dialects namely, Akawaio, Arawak, Arecuna, Carib, Macusi, Patamona, Wai Wai, Warrau and Wapishana.

Population

The 2002 Population and Housing Census shows that the population of Guyana has risen to 751,223 persons - higher than the 1991 census - by a little more than 27,500 persons.

Table 2: Population Statistics for Guyana by Regions. (Source Bureau of Statistics - Population Census 2002)

REGION	NUMBER	PERCENT
Region 1	24,275	3.2
Region 2	49,253	6.6
Region 3	103,061	13.7
Region 4	310,320	41.3

Region 5	52,428	7.0
Region 6	123,695	16.5
Region 7	17,597	2.3
Region 8	10,095	1.3
Region 9	19,387	2.6
Region 10	41,112	5.5
TOTAL	751,223	100.0

Population Distribution

The population is concentrated in Regions 4 and 6, with 41.3 percent located in Region 4. Region 3 is the third most populous with almost 14%. Nationally, males outnumber females by a small percent (0.1). The sex distribution of the population of the Regions is similar to the national distribution with the exception of Region IV, where the proportion of males to females is higher than the other Regions.

Rural and Urban Population Distribution

Four of the ten Administrative Regions have urban centres, i.e. Regions II, IV, VI and X. The combined population of these towns and the capital city, Georgetown, totalled 213,705 or 28.5 percent of the population in 2002. The remaining 71.5 percent of the population live in villages, mainly along the coastal belt, while a few others are scattered deep in the hinterland of the country. Contrary to the National and Regional scales, females account for 51.7 percent of the urban dwellers compared to 48.3 percent for males. This situation is the reverse for the rural areas, where males account for 50.8 percent of the rural population and females 49.2 percent.

Urbanisation

Guyana has only one city, but there are five small towns of administrative and commercial importance at the Local Government level. In addition to the City of Georgetown, the five towns are recognised municipal districts, each with its own Mayor and Council charged with local government responsibilities.

Georgetown, founded over 200 years ago, is situated on the east bank and at the mouth of the Demerara River. It is the capital city and seat of Central Government; the main commercial centre and the principal harbour. It covers an area of 38 km² and has, with its environs, a population of approximately 215,000.

New Amsterdam, situated on the east bank and at the mouth of the Berbice River, is the capital of the East Berbice-Corentyne Region. It covers an area of 2.78 km² and has a population of about 20,000. It has an important seaport for the export of bauxite.

Linden, located on the Demerara River about 107 km from Georgetown, was



created a town in 1970 and incorporates the mining town of Mackenzie, and two former village districts, Wismar and Christianburg. The area of the town is approximately 142 km² with an estimated population of 30,000.

Corriverton, located on the western bank and at the mouth of the Corentyne River, formerly comprised three village districts. The town was established in 1970 and has an area of 126 km² and a population of about 15,000. There is a small seaport in this town.

Rose Hall, located along the Corentyne coastland about 29 km from New Amsterdam, was formerly a village district. The town was established in 1970 with an area of 13 km² and a population of about 10,000.

Anna Regina, situated about 19 km from Adventure on the Essequibo Coast, was established as a town in 1970. This town serves as the Administrative centre for the Pomeroon – Supenaam Region.

Bartica, though not a town, is considered as the most important hinterland mining town for small gold and diamond miners. It is situated at the confluence of the Essequibo, Mazaruni and the Cuyuni Rivers, and serves as the administrative centre of the Cuyuni – Mazaruni Region.

Population Composition

The population of Guyana is ethnically heterogeneous, composed chiefly of a native Amerindian population together with the descendants of immigrants

who came either as slaves or as indentured labourers. The population, therefore, comprise groups of persons with nationality backgrounds from Europe/Portugal, Africa, China, and India, with the Amerindians as the indigenous population.

In addition to persons of at least five distinct nationality backgrounds, and the native Amerindian population, over the centuries, there have been intermarriages between the various ethnic groups resulting in the emergence of a group of 'mixed heritage'. This is now a significant and growing group within the population. Persons from this group are generically referred to as 'mixed'.

The distribution of the population by ethnicity shows the highest proportions to be of East Indian and African heritage – 43% and 30% respectively. The third ranked is the mixed heritage with approximately 17% followed by the Amerindians comprising almost 10% of the population. The other groups represent are less than 1% of the national population.

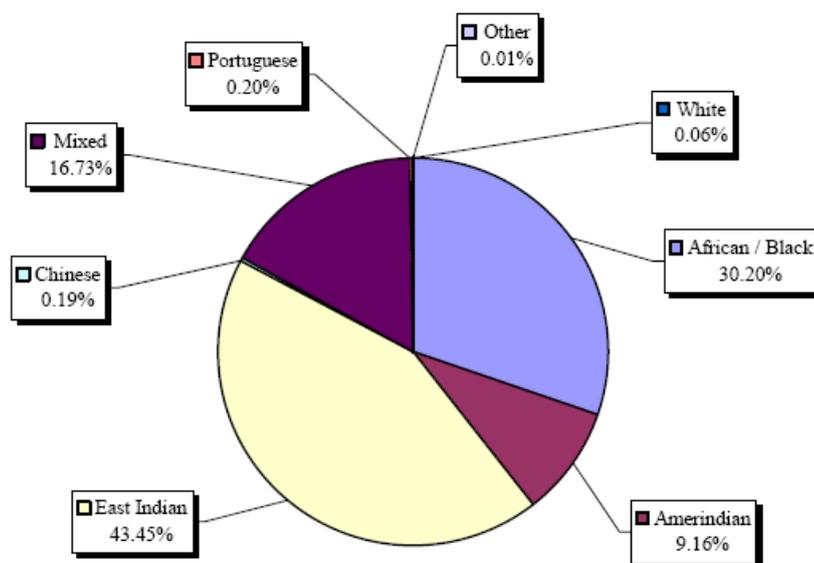


Figure 1: Population Distribution by Ethnicity

Life Expectancy

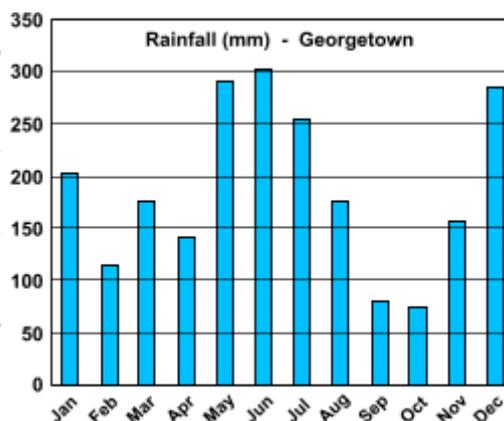
The life expectancy of Guyana is 65.5 years for males and females.

Employment

The agricultural sector provides employment for 22% of the population; the services sector 53%; and the manufacturing sector 24%. A large volume of the workers are paid employees followed by own account workers, with less than 4% engaged in unpaid family worker and employer group respectively. Also, 28.4% of the employees had elementary occupations, while in ranking order, craft and related trade workers (16.3%), service, shop and market sale workers (14.8%), and the remaining occupations (less than 10%) make up the labour force. The overwhelming proportion (21.6 percent) of the women's employment is in "service, shop and market sale categories", while "clerical" and "technical and associate" professions engage equal proportions of women (about 16 percent). The unemployment rate is about 11.7% (Bureau of Statistic 2002)

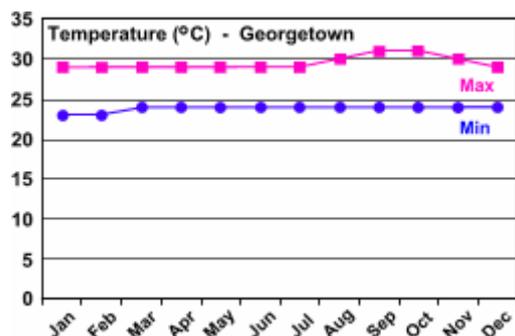
CLIMATE

Located near the equator, Guyana has a tropical climate, and temperatures do not vary much throughout the year. Guyana lies within the equatorial trough zone and its weather and climate are influenced primarily by the seasonal shifts of this trough and its associated zone of rain bands called the Inter-Tropical Convergence Zone (ITCZ).



The seasons are determined primarily by the variation in rainfall patterns. Along the coast, there are two wet seasons - from May to July and from November to January, and two dry seasons - from February to April and from August to October. In the savannah region, however, there is only one long wet season - from the end of April to the end of September, and one long dry season for the rest of the year.

Rainfall ranges from over 3,000 mm in the forested region to about 1,600 mm in the savannah region, and averages about 2,300 mm along the coast. During the rainy season, sunshine averages 5 hours per day but, during the dry seasons, 7 hours or more can be obtained.



Temperature ranges between 16°C and 34°C. Lower values can be experienced at higher elevations. Along the coast, temperatures rarely rise above 31°C or fall below 22°C, due to the stabilizing effect of the ocean and the north-east trade winds.

Relative humidity is high with 80 per cent or more along the coast, about 70 per cent in savannah region and sometimes 100 per cent in the forested region, especially in the mornings. Fog can be widespread and persistent in the hinterland regions

Although the temperature never gets dangerously high, the combination of heat and humidity can at times seem oppressive. The entire country is under the influence of the northeast trade winds, while during the midday and afternoon periods, sea breezes bring relief to the coast. Guyana lies south of the path of Caribbean hurricanes, none of which is known to have hit the country.

Temperatures in Georgetown are quite constant, with an average high of 32°C and an average low of 24°C in the hottest month (July), and an average range of 29°C to 23°C in February, the coolest month. The highest temperature ever recorded in the capital was 37.2°C and the lowest 16.6°C. Humidity averages 70 percent year-round. Locations in the interior, away from the moderating influence of the ocean, experience slightly wider variations in daily temperature, and night time readings - as low as 12°C - have been recorded. Humidity in the interior is also slightly lower, averaging around 60%.

GOVERNMENT

Guyana became an independent member of the Commonwealth in 1966 and in 1970 became a Cooperative Republic. Under the Constitution of October 6, 1980, executive power is vested in the President, who leads the majority party in the unicameral National Assembly and who holds office for the assembly's duration. The president appoints the Cabinet, which is responsible to the National Assembly. The minority members of the Assembly elect an Opposition Leader. The Assembly comprise members, who are elected in keeping with conditions associated with universal adult suffrage, for a term of five years.

The right to vote belongs to all Guyanese citizens 18 years of age or older. Voting is carried out by secret ballot under a system of proportional representation. Votes are cast for lists of candidates compiled by the political parties, and seats are allocated proportionally among the lists.

Local government is administered principally through the Regional Democratic Councils (RDCs), each led by a Chairman. The RDCs are elected for terms of up to five years and four months in each of the country's ten Regions.

Guyana has two legal traditions, the British common law and the Roman-Dutch code, the latter now largely relegated to matters of land tenure. The Constitution is the supreme law of the land. The structure of the Judicature consists of magistrate courts for civil claims of small monetary value and minor offenses; the High Court, with original and appellate jurisdiction in civil and criminal matters; and the Court of Appeal, with appellate authority in criminal cases. The Court of Appeal has the authority to conduct further hearings on matters dealt with by the High Court.

Religion

The single largest religious group is of the Hindu faith with a following of almost 28% of the population, however, about 50 percent are Christians, with the Pentecostal Faith – divided among a number of congregation- making up the majority followed by the Anglicans and Roman Catholic. The number of Muslim is approximately 8 percent. (Bureau of Statistics 2002).

Table 3: Religious Group and Distribution

Religious Group	2002 CENSUS					
	Absolute			Percentage		
	Male	Female	Total	Male	Female	Total
Anglican	25,838	26,096	51,935	3.4	3.5	6.9
Methodist	5,986	6,494	12,480	0.8	0.9	1.7
Pentecostal	57,624	69,207	126,831	7.7	9.2	16.9
Roman Catholic	30,689	29,869	60,558	4.1	4.0	8.1
Jehovah Witness*	3,636	4,550	8,185	0.5	0.6	1.1
Seventh Day Adventist	17,655	19,897	37,552	2.4	2.6	5.0
Bahai*	222	278	500	0.0	0.0	0.1
Muslim	28,201	25,849	54,050	3.8	3.4	7.2
Hindu	108,270	105,012	213,282	14.4	14.0	28.4
Rastafarian*	2,970	1,035	4,005	0.4	0.1	0.5
Other Christians	65,371	67,727	133,098	8.7	9.0	17.7
None	21,195	10,738	31,933	2.8	1.4	4.3
Other	4,743	5,141	9,884	0.6	0.7	1.3
Not Stated	3,634	3,297	6,931	0.5	0.4	0.9
Total	376,034	375,189	751,223	50.1	49.9	100

Education

In the 2006 school year 110,500 pupils were enrolled in 422 elementary schools in Guyana. Secondary, technical, and teacher-training institutions had a total of 70,800 students. The country's principal institution of higher education is the University of Guyana, which was founded in 1963 in Georgetown. Education is valued as a means of social mobility. In 2005 Guyana had a literacy rate of 99%, this being one of the highest in Latin America.

Economy

Immediately before independence in 1966, Guyana was in the early stages of developing its resources. This development continued under an economic plan drawn up by British, American, and Canadian experts. Manufacturing, which was on a small scale in the late 1960s, was expanded in the 1970s, but in the early 2000s the economy of Guyana was dominated by agriculture, mining, and service industries. The country had a gross domestic product (GDP) of \$190,727 million in 2008. The national budget in 2009 has a GDP of 206,030 million.

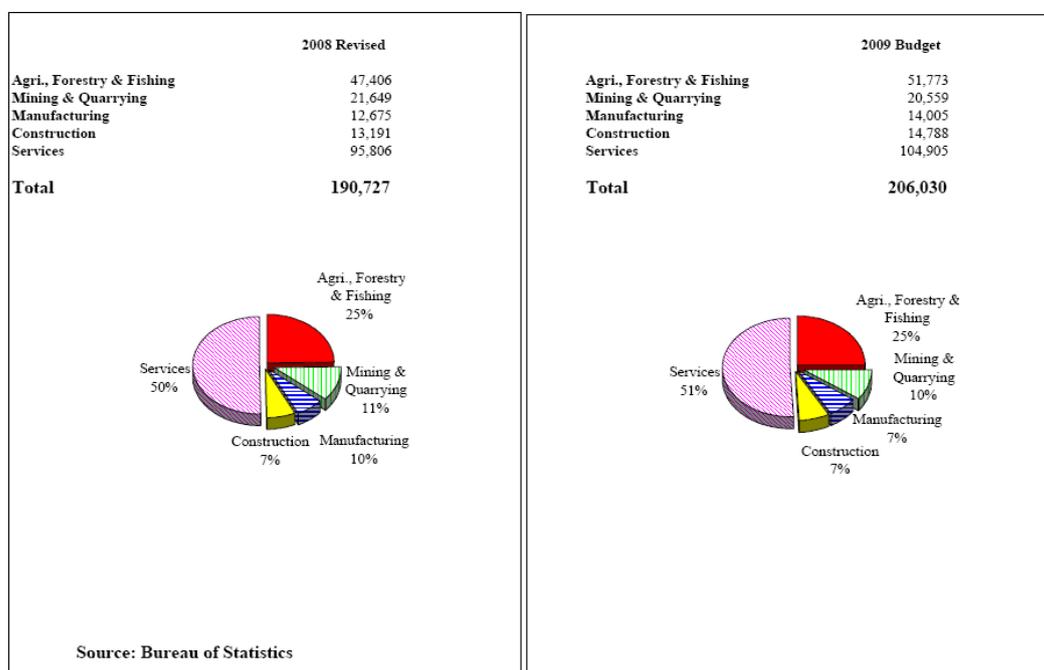


Table 4: GDP Contribution by Sector

SECTOR	Budget			Revised	Budget	
	2004	2005	2006	2007	2008	
AGRICULTURE, FORESTRY, FISHING	31.3	30.3	30.2	29.6	27.3	27.3
Sugar-cane	11.0	8.3	9.5	9.4	6.6	6.6
Rice Paddy	4.7	5.1	4.8	4.4	4.2	4.1
Other Crops	2.5	2.6	2.3	2.3	2.4	2.4
Livestock	4.5	5.0	4.6	4.4	4.9	5.0
Fishing	6.8	7.1	6.6	6.6	7.0	7.1
Forestry	2.0	2.2	2.4	2.4	2.1	2.2
MINING & QUARRYING	12.1	10.5	9.7	8.6	11.2	10.6
Bauxite	1.4	2.6	2.3	1.9	3.2	3.4
Other	10.7	7.8	7.4	6.7	8.1	7.2
MANUFACTURING	9.6	8.0	8.7	8.9	7.6	7.3
Sugar	4.4	3.4	3.8	3.8	2.6	2.6
Rice	2.1	1.1	1.2	1.5	1.2	1.0
Other	3.1	3.6	3.6	3.6	3.7	3.8
ENGINEERING & CONSTRUCTION	5.2	6.2	6.4	6.6	6.8	6.9
SERVICES	41.7	45.0	45.0	46.3	47.1	47.9
Distribution	4.1	4.7	5.2	5.4	5.8	6.0
Transportation	9.7	11.3	11.3	12.4	12.8	13.6
Rental of Dwellings	4.2	4.7	4.8	4.8	5.0	5.0
Financial Services	3.6	3.9	4.0	4.1	4.4	4.5
Government	18.3	18.4	17.6	17.3	17.0	16.5
Other	1.8	2.0	2.1	2.2	2.3	2.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Source: Bureau of Statistics.

Agriculture

Agriculture accounts for 25% of the GDP and employs 22% of the labour force. Sugar and rice, with their by-products, account for most of the agricultural exports. Cultivation of sugarcane and rice is confined primarily to the narrow coastal strip of rich, alluvial soil. Coconut, coffee, cacao, citrus fruits, corn, manioc and other tropical fruits and vegetables are grown primarily for home consumption. Large areas of rough pasture exist in the interior savannah where substantial numbers of cattle, hogs, and sheep are raised. Chicken rearing, including the production of eggs, is done on a large scale basis in the coastland areas resulting in self sufficiency.

Sugar

The total production of sugar for 2008 was 226,300 tonnes with 103,300 produced in the 1st crop (spring) and 123,000 in the 2nd Crop (autumn). The area harvested was 39,100 hectares. The volume of sugar exported for the year was 205,300 tonnes at a value of G\$ 27,738 M. This equates to 7% contribution to GDP.

Rice

The total area of rice cultivated and harvested for 2008 was 119,800 hectares producing 507,000 tonnes of paddy for a rice equivalent of 329,600 tonnes. 196,300 tonnes of rice was exported at a value of G\$ 23,830 M.

Forestry

In 2008 the timber harvest was 382,393 cubic meters. Almost all of the harvest was made up of hardwoods, used mainly in the construction, housing and furniture-making sectors.

Fishing

Fishing in Guyana is concentrated along the Atlantic coast. The industry expanded during the 1990s and early 2000s, with shrimp becoming a valuable export. The catch in 2008 was 24,800,000 kilogrammes of fish, 900,000 kilogrammes of prawns and 35,400,000 kilogrammes of small shrimp produced.

Mining

Guyana is a major producer of bauxite with 1,995,000 metric tons having been mined in 2008, with 1,454,000 tonnes being dried; 232,000 tonnes calcined; and 309,000 tonnes chemical. Guyana also produces gold and diamonds with 8,050 kilogrammes and 169,000 metric carats respectively having been produced in 2008.

Manufacturing and Energy

Manufacturing in Guyana largely involves the processing of minerals, especially bauxite, and of agricultural and forest products, including sugar, rice, rum, and lumber for export. Factories also produce foodstuffs, beverages, construction materials, clothing, soap, and paint for local use. The annual production for 2008 of some major output in the manufacturing sector are rum - 14.2 million litres, edible oil - 350 million litres, aerated - 3.9 million cases, margarine - 1.5 million kilogrammes, paints - 2.5 million litres and detergent - 737,000 kilogrammes.

Table 5: Agriculture Production for 2008 by Regions

CROPS	UNITS	REGION	REGION	REGION	REGION	REGION	REGION	REGION	REGION	REGION	REGION	TOTAL
		1	2	3	4	5	6	7	8	9	10	
Cereals and legumes												
Corn	MT	703.1	291.38	104.4	45.9	36.0	11.7	15.1	34.1	108.0	0.0	1,349.7
Black eye	MT	8.7	20.23	0.0	0.0	6.0	5.3	0.7	3.9	10.0	0.0	54.8
Minica	MT	2.4	284.50	0.0	3.4	7.0	6.0	0.0	15.9	18.0	0.0	337.2
Other Legumes	MT	0.0	8.10	0.0	0.0	0.0	2.0	0.0	0.0	6.0	0.0	16.1
Oil Seeds												0.0
Peanuts	MT	499.0	0.00	0.0	0.0	0.0	0.0	35.2	3.6	34.0	0.0	571.8
Coconuts	⁰⁰⁰ NUTS	6,100.5	49,975.00	355.0	399.0	10,850.0	3,955.0	0.0	0.0	150.0	0.0	71,784.5
Ground Provision												0.0
Cassava (bitter)	MT	3,266.1	3,075.80	0.0	341.7	136.0	85.0	136.1	2,722.5	2,210.0	0.0	11,973.2
Cassava (sweet)	MT	1,664.7	2,821.74	1,234.2	955.4	204.0	119.0	122.5	3,402.0	1,190.0	10.0	11,723.5
Sweet Potato	MT		37.15	480.4	217.3	91.8	30.9	0.0	0.0	357.0	2.8	1,217.3
Eddo	MT	1,653.4	489.72	870.4	481.4	139.4	93.8	0.0	0.0	884.0	15.6	4,627.8
Yam	MT	2,168.2	27.51	81.6	0.0	0.0	0.0	0.0	217.7	136.0	0.0	2,631.0
Tannia/Dasheen	MT	77.1	55.02	0.0	0.0	0.0	0.0	0.0	0.0	108.8	4.1	245.0
Plantain	MT	680.4	1,156.00	1,078.5	212.2	408.0	544.0	283.0	43.2	408.0	7.5	4,820.7
Vegetables												0.0
Tomato	MT	0.0	15.27	500.0	108.8	562.5	546.3	0.0	0.2	75.0	22.5	1,830.5
Cabbage	MT	1.6	35.45	780.3	183.6	297.5	174.3	0.0	0.0		28.5	1,501.2
Pumpkin	MT	217.7	275.20	816.0	161.8	204.0	103.4	10.2	0.0	272.0	8.7	2,069.0

Bora	MT	14.2	94.69	691.2	1,476.0	756.0	832.5	40.8	0.0	72.0	41.4	4,018.8
Ochro	MT	1.6	110.82	785.4	467.5	629.0	586.5	9.1	0.0	102.0	20.4	2,712.3
Boulangier	MT	21.8	110.55	355.5	188.1	270.0	321.8	13.6	0.0	180.0	20.3	1,481.6
Squash	MT	20.4	18.59	754.4	311.6	512.5	389.5	0.0	0.0		2.1	2,009.1
Cucumber	MT	87.1	84.00	579.6	241.2	378.0	292.5	0.0	0.0	36.0	8.1	1,706.5
Mustard	MT	0.0	0.00	0.0	0.0	20.3	11.3	0.0	0.0	4.8	0.0	36.3
Pak Choi	MT	0.0	5.06	190.4	97.7	54.0	22.5	0.0	0.0	10.5	8.3	388.4
Poi	MT	0.0	7.82	221.9	108.5	58.5	48.6	0.0	0.0		5.1	450.3
Corilla	MT	0.0	2.31	372.3	98.6	340.0	119.0	0.0	0.0		8.5	940.7
Other Vegetables	MT	209.6	47.27	160.2	117.4	31.5	13.5	544.3	5.6	7.1	11.9	1,148.4
Spices & Seasoning												0.0
Eschallot	MT	0.0	32.68	172.7	65.6	157.5	68.6	0.0	0.0		5.6	502.7
Hot Pepper	MT	0.0	77.67	416.1	277.0	433.2	484.5	0.0	0.0	45.6	6.3	1,740.4
Ginger	MT	521.6	0.00	0.0	0.0	0.0	0.0	0.0	0.0		0.0	521.6
Tumeric	MT	567.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0		0.0	567.0
Other Spices	MT	0.0	6.69	395.6	124.9	496.2	438.3	0.0	0.0	3.8	3.0	1,468.5
Citrus												0.0
Lime	MT	0.0	285.00	343.1	160.7	182.4	319.2	0.0	0.0	57.0	2.9	1,350.4
Grapefruit	MT	0.0	0.00	118.6	91.2	0.0	22.8	8.7	0.0		0.0	241.3
Orange	MT	0.0	2,963.00	606.5	329.5	0.0	102.6	0.0	0.0	228.0	1.1	4,230.6
Other Citrus	MT	410.6	205.00	161.9	90.1	0.0	11.4	40.8	0.0		0.0	919.7
Fruits												0.0
Banana	MT	0.0	4,955.28	1,011.8	414.8	435.2	584.8	0.0	0.0	217.6	9.5	7,629.0

Pineapple	MT	0.0	788.88	714.0	171.7	0.0	0.0	0.0	0.0	204.0	9.4	1,888.0
Avacado (Pear)	MT	0.0	735.30	34.8	21.7	17.1	28.5	0.0	0.0	5.7	1.1	844.1
Sapodilla	MT	0.0	21.85	5.1	0.0	74.1	68.4	0.0	0.0	0.0	0.0	169.5
Carambola	MT	0.0	134.45	93.5	36.5	62.7	64.0	0.0	0.0	2.9	0.0	394.0
Watermelon	MT	0.0	637.82	357.7	81.6	557.6	462.4	0.0	0.0	136.0	0.0	2,233.1
Cashew	MT	0.0	0.00	9.1	0.0	17.1	20.0	0.0	0.0	285.0	0.0	331.2
Mango	MT	0.0	816.40	738.4	409.0	533.0	512.5	0.0	0.0	600.0	0.0	3,609.3
Cherry	MT	0.0	37.81	126.5	146.5	96.9	45.6	0.0	0.0	11.4	2.3	467.0
Passion Fruit	MT	0.0	90.00	635.4	367.2	142.5	91.2	0.0	0.0	15.7	0.0	1,342.0
Bilimbi	MT	0.0	134.12	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	149.5
Other Fruits	MT	59.6	171.15	608.8	306.7	228.0	347.7	0.0	0.0	5.7	5.7	1,733.3
Coffee	MT	14.8	590.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	605.0
Cocoa	MT	260.8	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	260.8

Table 6: Employment by Major Industry - Males

CATEGORY	REGION									
	I	II	III	IV	V	VI	VII	VIII	IX	X
Agriculture, Hunting and Fishing	1525	3144	7547	6652	4360	11343	1024	645	2863	1743
Fishing Operator / Fish Farms	235	236	885	2096	538	1143	23	23	107	40
Mining and Quarrying	738	733	344	1808	197	263	1358	1258	77	2004
Manufacturing	366	1567	4058	10800	1684	4061	219	31	135	572
Electricity, Gas, Steam & Hot Water Supply	12	87	279	873	112	243	29	0	22	106
Construction	162	832	2345	8519	885	1925	213	34	186	811
Wholesale & Retail Trade; Vehicles Repair	320	1074	3419	12214	988	2917	353	83	135	824
Hotel and Restaurants	43	82	245	1121	81	299	38	7	12	58
Transport, Storage and Communication	147	757	2372	7921	749	1992	298	47	86	637
Financial Intermediation	0	53	160	916	33	163	9	0	1	23
Real Estate, Renting and Business Activities	59	179	439	2927	162	458	36	82	9	238
Public Administration & Defense; Compulsory Social Sector	145	588	1210	4629	538	927	136	52	124	338
Education	119	274	341	1329	161	487	67	20	124	192
Health & Social Work	53	87	140	626	39	147	22	32	75	65
Other Community Social and Personal Activities	210	728	1050	3017	256	701	177	31	46	282
Private Household with Employment	24	160	228	696	53	114	13	3	24	24
Extra Territorial Organisation & Bodies	0	1	4	169	4	41	0	0	5	3
Don't Know	6	9	10	1144	7	8	5	6	0	10
TOTAL	4164	10591	25076	67457	10847	27232	4020	2354	4031	7970

Table 7: Employment by Major Industries – Females

CATEGORY	REGION									
	I	II	III	IV	V	VI	VII	VIII	IX	X
Agriculture, Hunting and Fishing	438	341	470	838	178	605	504	149	1057	189
Fishing Operator / Fish Farms	6	7	36	168	5	25	2	0	5	7
Mining and Quarrying	48	27	9	150	6	30	52	65	5	299
Manufacturing	74	362	1103	4371	281	565	74	14	75	219
Electricity, Gas, Steam & Hot Water Supply	1	11	59	304	24	47	7	0	5	40
Construction	3	7	36	202	11	29	1	1	2	16
Wholesale & Retail Trade; Vehicles Repair	173	608	1943	8744	586	2201	280	63	82	900
Hotel and Restaurants	53	109	318	2247	111	377	133	20	29	218
Transport, Storage and Communication	12	35	198	1366	59	170	13	1	3	91
Financial Intermediation	0	51	221	1202	32	166	12	0	1	58
Real Estate, Renting and Business Activities	12	69	244	2007	63	201	25	7	9	214
Public Administration & Defense; Compulsory Social Sector	68	237	796	3949	292	554	114	24	61	310
Education	218	739	1253	4445	693	1359	218	98	174	764
Health & Social Work	86	226	421	2236	157	612	93	31	39	368
Other Community Social and Personal Activities	29	75	258	2224	61	232	46	7	31	222
Private Household with Employment	159	287	551	2812	173	514	85	25	115	131
Extra Territorial Organisation & Bodies	0	1	12	240	1	14	0	0	0	1
Don't Know	0	3	4	308	2	2	1	1	1	1
TOTAL	1380	3195	7932	37813	2735	7703	1660	506	1694	4048

Chapter 2

Chemical Production, Import, Export, Storage, Transport, Use and Disposal

2.0 Introduction

The aim of this chapter is to provide basic information on the production, import, export, storage, transport, use, recycling and disposal of chemicals in Guyana

ANNUAL EXPORTS OF SELECTED COMMODITIES BY VOLUME

('000)

Period	Sugar (tonne)	Rice (tonne)	Bauxite		Shrimp/ Prawns (kg.)	Rum (Litres)	Molasses (kg.)	Timber/ Plywood (cub. Mtrs.)
			Dried (tonne)	Calcined (tonne)				
1990	132	51	1,084	305	2,332	...	4	13
1991	157	50	975	353	2,998	...	1	16
1992	230	115	685	210	2,298	...	9	15
1993	239	124	603	238	3,123	...	32	18
1994	239	181	362	184	3,525	8,774	10	39
1995	225	201	1,735	212	3,429	11,106	11	35
1996	257	262	2,101	173	3,002	8,774	19	145
1997	248	285	2,148	178	...	8,458	16	164
1998	237	250	2,193	153	...	7,745	4	162
1999	275	252	2,284	110	...	4,709	61	166
2000	277	208	2,421	109	...	6,930	40	184
2001	252	209	1,707	98	...	8,653	24	187
2002	282	193	1,453	62	...	11,098	47	185
2003	312	200	1,584	76	...	8,675	52	151
2004	290	243	1,280	133	...	7,770	56	206
2005	230	182	1,365	172	...	2,869	42	231
2006	239	205	1,294	140	...	3,008	37	332
2007	246	269	1,986	213	...	2,750	25	241
2008	205	196	1,871	245	...	1,944	19	174

2.1 Chemical Production

The production of chemicals for local use or export is minimal. Most of the local chemical needs are met through importation. The importation of chemicals into Guyana is governed by a legislative process which is managed by the Pesticides and Toxic Chemicals Control Board.

Table 8: Chemical Production

Items	Unit	Production 2008
Paint	Litres ('000)	2,488.6
Soap	kg ('000)	28.5
Detergent	kg ('000)	737.4
Pharmaceutical Liquids	Litres ('000)	374.3
Pharmaceutical Ointments	Kg ('000)	8.2

2.2 Chemical Import

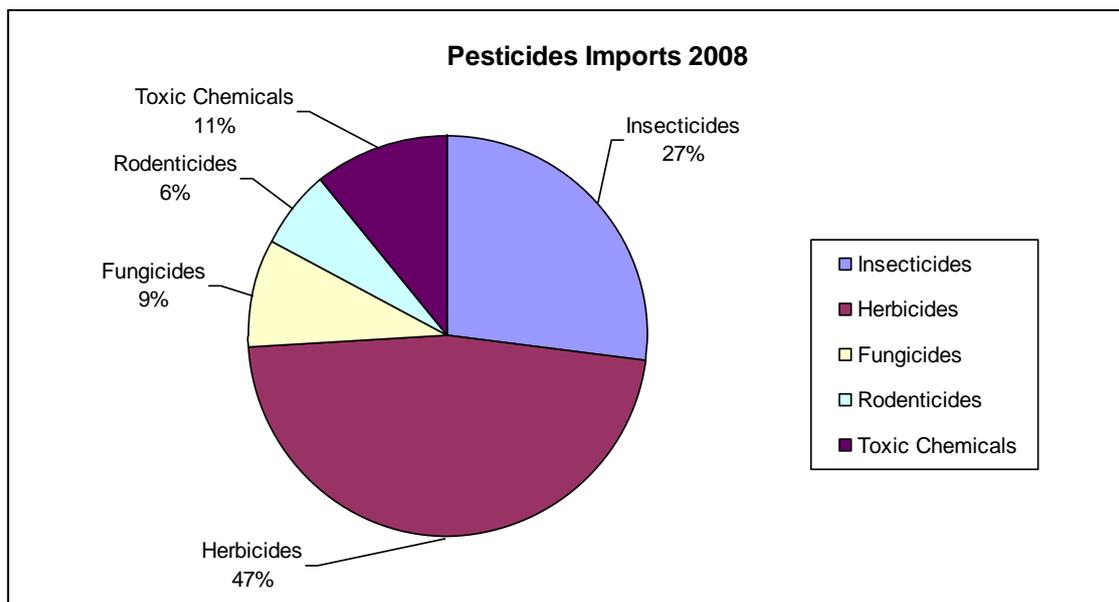
The average quantity and the monetary value of four major categories of chemical import are shown in Table 2 A. Table 2 B shows a breakdown of the pesticides imported for 2008. It should be noted that the cost in Guyana is valued at the Cost, Insurance and Freight (CIF) value of the goods and the values are shown in Guyanese dollars.

The chemical industry is represented by a network of individual importers, manufacturers and distributors. Of the over fifty (50) importers there are twelve large companies that are categorized as importers/distributors, serving the industrial and household markets. Chemicals are imported into the country as raw materials, intermediaries and finished products. The imports are mainly for gold and bauxite mining, paint, sugar, rice and other agricultural sub-sectors, and for the manufacture of industrial and domestic cleaning compounds.

Chemicals are imported mainly from the European Union (EU), Canada, United States of America (USA), India and China. However, other countries in Latin America and the Far East have supplied some chemical substances to local distributors.

Table 9: Chemicals Import

Pesticides	Cost	Amount (Quantity)	Amount (Active Ingredient)
Insecticides	\$271,432,677.43	365,584 litres 445 kilogrammes	150,758 kilogrammes
Herbicides	\$470,528,438.67	379,554 litres 30,377 kilogrammes	222,008 kilogrammes
Fungicides	\$86,951,744.88	3,835 litres 19,304 kilogrammes	1,210 kilogrammes
Rodenticides	\$64,639,477.72	425 litres 488,252 kilogrammes	14,196 kilogrammes
Toxic Chemicals (Only Disinfectant & Chlorine)	\$109,323,618.97		
TOTAL	\$1,002,875,957.67		



There are one hundred and thirty-two (132) vending premises for pesticides and toxic chemicals. These are distributed across Guyana as follows:

- (a) Region 1 - 0
- (b) Region 2 - 40
- (c) Region 3 - 17
- (d) Region 4 - 29
- (e) Region 5 - 9
- (f) Region 6 - 33
- (g) Region 7 - 0
- (h) Region 8 - 0
- (i) Region 9 - 0
- (j) Region 10 - 3

2.3 Chemical Export

All of the chemicals produced with the use of imported raw materials are utilized locally. Hence chemical export is not an issue at this time. However, there exist legislative provisions for chemical exports to be channelled through the Pesticides and Toxic Chemicals Control Board.

2.4 Chemical Storage

There is no bulk chemical storage or warehouse facility for the storage of chemicals in Guyana. There are twelve storage bonds or holding facilities, and

which are owned by major importers, for the storage chemicals. All of the pesticides are stored in their original containers on pallets in well secured bonds. However, paint manufacturers and users of other similar chemicals resort to storage in tanks. All chemicals storage facilities are marked accordingly with appropriate signs as stipulated under the Pesticides and Toxic Chemicals Regulations 2004. The storage of electrical equipment containing Poly Chlorinated Biphenyls (PCB) is stored at one location i.e. Sophia which is located on the outskirts of the city.

2.5 Chemical Transportation

There are no transportation facilities that are specifically used for transit of chemicals to other countries. Transport of chemicals to Guyana is via the Georgetown harbour. Chemicals are transported in containers from the wharves to bonds or tanks for storage, distribution and sale. There are no long distance haulage facilities available in Guyana. Any transportation of chemicals in excess of one hundred litres must be done with the acknowledgement of the Pesticides and Toxic Chemicals Control Board.

2.6 Chemical Use

Chemicals are used throughout the social echelon of society. However, the use of chemicals by minors (under 16 years of age) is prohibited. The use of paints, bleaches and disinfectants by minors is common. There are no quantitative data available on chemical use except for imports.

2.7 Recycling of Chemicals

There are no known cases of any manufacturing or other facility involved with the recovery or recycling of chemicals in Guyana.

2.8 Chemical Waste

There is one existing inventory of hazardous waste generation in Guyana. This inventory was done in 2007 to provide information for the development of a hazardous waste management strategy.

Hazardous waste was recorded for 24 of the Basel Convention's 47 waste streams in Guyana. The amounts generated in the waste streams varied

greatly. Four (4) waste streams contributed over 50,000 kgs of waste each. These were:

- **Y9:** 317,067.8 kgs; 42.74%; reported by 374 entities
- **Y6:** 180,025.50 kgs; 24.27%; reported by 116 entities
- **Y1:** 107,005.57 kgs; 14.43%; reported by 29 entities
- **Y34:** 53,186.78 kgs; 7.17%; reported by 27 entities

These four waste streams accounted for almost 95% of the total waste reported with one waste stream, waste oils/water, hydrocarbons/water mixtures, emulsions (Y9) accounted for over 55% of the total reported wastes

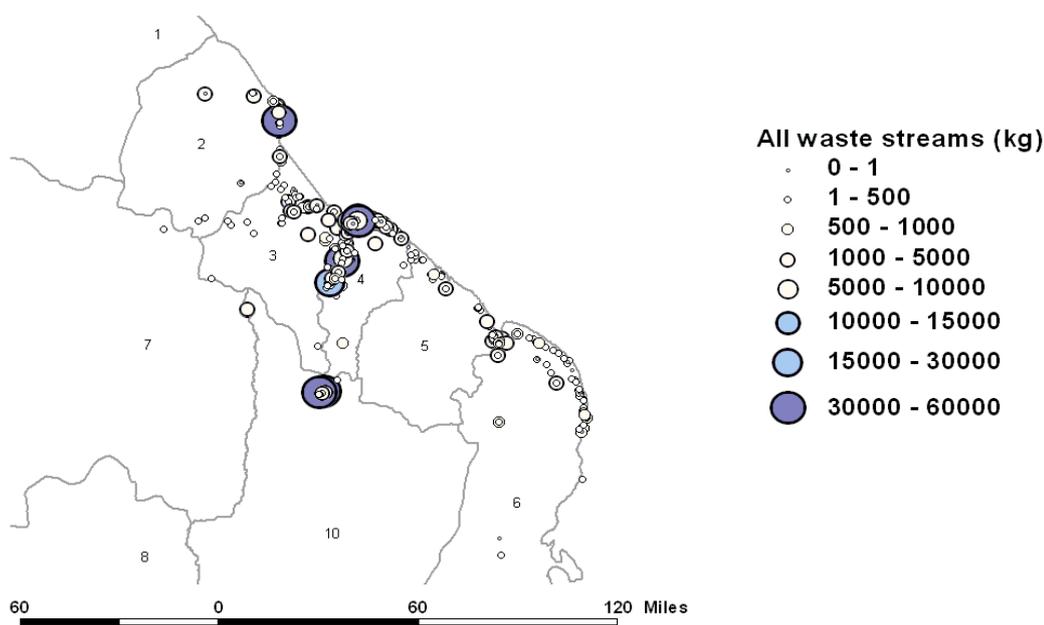


Figure 2. Spatial Distribution of Hazardous Waste Generated in Guyana in 2007 for all Categories

generated.

Table 9 provides a summary of the hazardous waste generated in Guyana in 2007 as reported by survey participants and Figure 2 illustrates the spatial distribution of generators (survey respondents) of hazardous waste.

Twenty-two (22) major sectors contributed to the 741,780 kgs of waste reported being generated in Guyana in 2007. Of these however, three sectors accounted for over 51% of the hazardous waste reported:

- 500 – 505: *Sale, maintenance and repair of motor vehicles and motorcycles including retail sale of automotive fuel (21.23%)*

- 520 – 526: *Retail trade, except of motor vehicles and motorcycles; Repair of personal and household goods (20.00%)*
- 510 – 519: *Wholesale trade except of motor vehicles; motorcycles; personal and household goods (10.18%).*

The six largest sectors generating hazardous waste were responsible for over 70% of the total waste in 2007 and accounted for 58% of the companies reporting.

Table 9: Categories of wastes to be controlled**Waste Streams**

Y Code	Description of Waste Category	Number of Entities Generating Waste	Volume (Kgs)	% of Total Waste Generated
Y1	Clinical wastes from medical care in hospitals, medical centers and clinics	29	107,005.57	14.43
Y2	Wastes from the production and preparation of pharmaceutical products	1	27.00	0.00
Y3	Waste pharmaceuticals, drugs and medicines	21	4,067.31	0.55
Y4	Wastes from the production, formulation and use of biocides and phytopharmaceuticals	3	102.13	0.01
Y5	Wastes from the manufacture, formulation and use of wood preserving chemicals	3	1.89	<0.01
Y6	Wastes from the production, formulation and use of organic solvents	116	180,025.50	24.27
Y7	Wastes from heat treatment and tempering operations containing cyanides	1	0.51	<0.01
Y8	Waste mineral oils unfit for their originally intended use	9	2912.32	0.39
Y9	Waste oils/ water, hydrocarbons/ water mixtures, emulsions	374	317,067.80	42.74
Y10	Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)			
Y11	Waste tarry residues arising from refining, distillation and any pyrolytic treatment			
Y12	Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish	110	24,897.27	3.36

Y13	Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives	2	242.67	0.03
Y14	Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known	5	1,384.62	0.19
Y15	Wastes of an explosive nature not subject to other legislation			
Y16	Wastes from production, formulation and use of photographic chemicals and processing materials	5	160.76	0.02
Y17	Wastes resulting from surface treatment of metals and plastics	1	1.32	<0.01
Y18	Residues arising from industrial waste disposal operations			
Y19	Metal carbonyls	2	34.27	<0.01
Y20	Beryllium; beryllium compounds			
Y21	Hexavalent chromium compounds			
Y22	Copper compounds			
Y23	Zinc compounds			
Y24	Arsenic; arsenic compounds			
Y25	Selenium; selenium compounds			
Y26	Cadmium; cadmium compounds			
Y27	Antimony; antimony compounds			
Y28	Tellurium; tellurium compounds			
Y29	Mercury; mercury compounds	263	3,282.26	0.44
Y30	Thallium; thallium compounds			
Y31	Lead; lead compounds	139	46,622.82	6.29
Y32	Inorganic fluorine compounds excluding calcium fluoride	1	6.77	<0.01
Y33	Inorganic cyanides	9	50.58	0.01

Y34	Acidic solutions or acids in solid form	27	53,186.78	7.17
Y35	Basic solutions or bases in solid form	1	183.75	0.02
Y36	Asbestos (dust and fibres)			
Y37	Organic phosphorus compounds	6	513.46	0.07
Y38	Organic cyanides			
Y39	Phenols; phenol compounds including chlorophenols			
Y40	Ethers			
Y41	Halogenated organic solvents	1	1.80	<0.01
Y42	Organic solvents excluding halogenated solvents			
Y43	Any congener of polychlorinated dibenzo-furan			
Y44	Any congener of polychlorinated dibenzo-p-dioxin			
Y45	Organohalogen compounds other than substances referred to in this Annex (e.g. Y39, Y41, Y42, Y43, Y44)			
		1	0.24	<0.01

Table 10 contains the reported generation of hazardous waste by sectors in Guyana for 2007.

ISIC Codes	Sector Description	No of Entities	Percent
122	Farming Animals including production of animal products	2	0.35%
132	Mining of non-ferrous metal ores	1	0.18%
141	Quarrying of Stone, sand and clay	5	0.88%
150 - 155	Manufacture of food products and beverages	40	7.02%
181	Manufacture of wearing apparel	1	0.18%
192	Manufacture of foot wear from leather	1	0.18%
200 - 202	Manufacture of wood and wood products except furniture	48	8.42%
210	Manufacture of paper and paper products	1	0.18%
220 - 222	Printing and publishing	9	1.58%
240 - 243	Manufacture of chemicals and chemical products	4	0.70%
250 - 252	Manufacture of rubber and plastics products	3	0.53%
314	Manufacture of accumulators, primary cells and primary batteries	1	0.18%
343	Manufacture of parts and accessories for motor vehicles and their engines	2	0.35%
369	Manufacturing of items not elsewhere classified	33	5.79%
401	Production , collection and distribution of electricity	2	0.35%
410	Collection, purification and distribution of water	6	1.05%
450 - 455	Construction	10	1.75%
500 - 505	Sale, maintenance and repair of motor vehicles and motorcycles including retail sale of Automotive fuel	120	21.23%
510 - 519	Wholesale trade except of motor vehicles; motorcycles; personal and household goods	58	10.18%
520 - 526	Retail trade, except of motor vehicles and motorcycles; Repair of personal and household goods	114	20.00%
550 - 552	Hotels and Restaurants	31	5.44%
600 - 603	Land transport; Transport via pipelines	5	0.88%
611	Sea and coastal water transport	3	0.53%
621	Scheduled air transport	2	0.35%
630	Supporting and auxiliary transport activities; activities of travel agent	1	0.18%
642	Post and courier activities	1	0.18%
711	Renting of transport equipment	2	0.35%
725	Maintenance and repair of office, accounting and computing machinery	4	0.70%

731	Research and experimental development on natural sciences and engineering	2	0.35%
740 - 749	Other business activities including legal, accounting, business and management consultancy, architectural and engineering, advertising	18	3.16%
800 - 803	Education	6	1.05%
850 - 853	Health and Social Work	26	4.56%
924	Sporting and other recreational activities	1	0.18%
930	Other service activities	6	1.05%
Total		569	100

The Environmental Protection Agency is currently assessing the Hazardous Waste Management Strategy for implementation in Guyana.

There are no known imports of chemical waste to Guyana and only used lead acid batteries are exported from Guyana. In addition, Guyana is a transit point for many chemical shipments enroute to various destinations for recycling or final disposal.

2.9 Intransit Waste

There are a number of hazardous waste intransit in Guyana from French Guiana. Table 11 shows the types of waste and the quantity.

Table 11: Intransit Hazardous Waste from French Guiana

<i>Waste</i>	<i>Amount</i>
Abestos	180 tons
Scrap and bulky: wastes of ferrous and non ferrous.	200 tons
Transformers containing or having contained PCBs.	150 tons
Tables set scrapping equipment containing hazardous components such as Cell, ampoules and bottles containing SF6.	50 tons
Wastes of electric and electronic facilities, junks, ferrous and non ferrous metals, VHU, sterile.	200 tons.
Asbestos wastes linked; fibrocements, steamrooms, material and facilities put to rubbish, materials of insulation and construction, tiles, false ceiling	80 tons
Free asbestos wastes: flocking, elements protection (combinations, filters, gloves), dust, soil, and glues, tablets brake, steamroom materials of insulation, construction.	20 tons
Glass fibers and glass wool	10 tons
Wastes containing or contaminated by PCB and/or PCT and/or PBB:hydraulic oils, insulating and heat transmission, transformers and capacitors, discarded equipment.	120 tons
Wastes of hospitals, related to medical cares	100 tons
Accumulators of acid lead used, whole or in pieces.	240 tons
Alumina of combustion, active coal and catalyst	10 tons
Liquid of cooling (thermal fluid)	10 tons

Wastes, in scattered quantity, descended of the use of resin, latex, grease, covering with plastic, glue and adhesive.	30 tons
Non halogenated solvents (alcohol isopropyl, methyl-ethyl-ketone, diestone, white spirit...).	40 tons
Halogenated solvents (di-chlorine-flourine-ethane, tri-chlorine-ethylene, tri-chlorine-ethane...).	40 tons
Wastes of us of ink, colouring, painting, lacquers of varnish, toner of impression	50 tons
Sprays and gases in container to pressure (including halons) containing or having contained dangerous substance.	20 tons
Wastes in scattered quantity, of the reprographics and photograph (chemical products of the photograph, baths, photographic papers...).	40 tons
Wastes, in scattered quantity, exit of the use of laboratory chemical products in mixture (chemical products of lab, currents, papers, revealing, reactive tubes...).	60 tons
Magnetic tapes, disks...	10 tons
Waste resulting from phytopharmacological and plant health products, including pesticides and weedkillers.	20 tons
Wastes of pharmaceutical products and medicines.	20 tons
Agents of extinction, conduits graphites, pasty/solid not reagents.	50 tons
Empty packing cleaned or not cleaned contained dangerous substances.	50 tons
Absorbents, filter materials, rags of wiping and protective clothing contaminated or not by dangerous substances.	100 tons
Waste of acid or basic solutions	25 tons
Cooling gas, CFC, HCFC, HFC (R11, R12, R22...)	30 tons
Aqueous rejections containing of dangerous substances.	200 tons
Grounds and stones containing dangerous substances	50 tons
Piles in mixture, piles saltworks, alkaline, lithium, mercury, cadmium-nickel, buttons.	10 tons
Mercury waste and residues (fluorescent tubes and lamps, piles, liquid mercury, solid materials contaminated with mercury, amalgams dentaries, ...).	20 tons
Piles in mixture, piles saltworks, alkaline, lithium, mercury, cadmium-nickel, buttons.	20 tons
Mercury waste and residues (fluorescent tubes and lamps, piles, liquid mercury, solid materials contaminated with mercury, amalgams dentaries, ...).	20 tons
Waste oil (liquid hydrocarbon, mixture and emulsion oil/water, sludge hydrocarbon).	150 tons
Scrap electrical equipment and electronic.	500 tons
Alumina of combustion, active coal, catalyst.	10 tons
Liquid of cooling (thermal fluid)	10 tons
Wastes, in scattered quantity, descended of the use if resin, latex, grease, covering with plastic, glue and adhesive.	30 tons
Non halogenated solvents (dimethylcarbinol, methyl-ethyl-ketone, white spirit...).	80 tons
Halogenated solvents (di-chlorine-flourine-ethane, tri-chlorine ethylene, tri-chlorine-ethane...).	40 tons
Wastes of use of ink, colouring, painting, lacquers of varnish, toner of impression.	50 tons
Sprays and gases in container to pressure (including halons) containing or having contained dangerous substance.	20 tons
Wastes, in scattered quantity of the reprographics and photograph	40 tons

(chemical products of the photograph, baths, photographic papers...).	
Wastes, in scattered quantity, exit of the use of laboratory chemical products in mixture (chemical products of lab, currents, papers, revealing, reactive tubes...).	60 tons
Magnetic tapes, disks	10 tons
Waste resulting from phytopharmacological and plant health products, including pesticides and weedkillers.	20 tons
Wastes of pharmaceutical and medicines.	20 tons
Agents of extinction, conduits graphites, pasty/solid non reagents.	50 tons
Empty packing cleaned or not cleaned having contained dangerous substances.	50 tons
Absorbents, filter materials, rags of wiping and productive clothing contaminated or not by dangerous substances.	100 tons
Waste of acid or basic solutions	25 tons
Cooling gas, CFC, HCFC, HFC (R11, R12, R22...).	30 tons
Aqueous rejections containing of dangerous substances.	200 tons
Grounds and stones containing of dangerous substances.	50 tons
Piles in mixture, piles saltworks, alkaline, lithium, mercury, cadmium-nickel, buttons.	10 tons
Mercury waste and residues (fluorescent tubes and lamps, piles, liquid mercury, solid materials contaminated with mercury, amalgams dentaries ...).	20 tons

2.8 Chemical Disposal

There are no waste disposal facilities for chemicals and chemical related waste. Chemical disposal is a critical issue for obsolete chemicals, expired and other similar chemicals. The obsolete chemicals are currently stored in a sealed secured bond. Disposal of chemicals from households are not monitored and is done in an ad hoc manner. There are no facilities for the treatment of waste produced by the manufacturing sector. These wastes are disposed of in waterways when the internal storage containers are full.

2.9 Unintentionally Generated Chemicals

There is no inventory for unintentionally generated chemicals such as dioxin, furans and other similar chemicals arising out of the incineration of waste, power generation and heating, transportation, disposal and land filling.

Guyana is currently approaching the Global Environmental Facility through the United Nations Environmental Programme under the Stockholm Convention on Persistent Organic Pollutants (POPs) for developing its National Implementation Plan which would incorporate inventories that will provide this type of information.

In the interim, a management plan is being developed by the Environmental Protection Agency that will examine the management of hazardous waste in Guyana.

2.10 Comments / Analysis

The capacity to collect data relating to the import and export of chemicals is adequate. Information pertaining to the import and export of chemicals is normally captured at the various ports of entry across the country by the Pesticides and Toxic Chemicals Board by virtue of the issuance of licenses and from information gathered from the Department of Customs and Trade Administration.

With respect to chemical usage, information can be collected at the various points of sale across the country or captured at the ports of entry to the country. The importation of chemicals is based on their usage requirement and demand; as such all of the imports can be accepted as the amount of chemicals utilised in the country.

Information on the generation of waste and more importantly hazardous waste management is the responsibility of the Environmental Protection Agency (EPA). However, this Agency's capacity for data collection on waste disposal of chemicals is inadequate. Currently it is possible, although not encouraged, to dispose of chemical waste in the sanitary landfill. Since chemicals wastes are intermingled with municipal waste, it is not possible to collect data on the quantities or types of waste disposed.

With respect to the technical infrastructure for recovery of chemicals, reporting procedures need to be established with the various recovery operations to:

- ensure that in cases where the recovered waste is shipped overseas, this is done in keeping with the provisions enshrined the Basel Convention to which Guyana is a signatory; and
- increase the awareness of the public to the quantities of wastes, namely used oil and lead-acid batteries that needs to be recovered.

The manufacturing entities are periodically examined by the Ministry of Labour's Occupational Health and Safety Department to identify and, where necessary, address occupational health and safety issues pertaining to, among

other things, the use and handling of chemicals. At present these agencies conduct inspections spontaneously and in most cases in response to complaints of malpractice. It would be prudent therefore for the Department to conduct more frequent inspections to ensure compliance with the existing legislation and procedural policies that exist under the EPA via Memorandum of Understanding between the two bodies.

Chapter 3

Priority Concerns Related to Chemical at All Stages of Their Life Cycle

3.0 Introduction

This chapter provides an overview of the concerns related to chemicals at all stages of their life cycle and is associated with environmental and health problems associated with chemicals production, importation, storage, use, waste generation, pollution and disposal in Guyana. Moreover, to the extent known, the chemicals or the categories of chemicals which are causing the concerns are highlighted.

Table 3.A: Description of Problem Areas

Nature of Problem	City/Region	Brief Description of Problem	Chemical(s)/Pollutants(s)
Water Pollution	Countrywide	Excess use of Pesticides Disposal of contaminated empty pesticide containers Gold Mining Operation Discharge of untreated effluents Improper discharge of waste oils Improper disposal of chemicals with other municipal waste Fertiliser runoff	All chemicals Mercury Petroleum Products Paints Disinfectants Detergents
Marine Pollution	Countrywide	Rivers discharge in the Ocean	All chemicals Mercury
Drinking Water Pollution	Region 7.8, 1	Waterways are source of drinking water Extent of drinking water pollution is not known	Mercury
Chemicals Residues	Countrywide	Improper post harvest handling Extent of food contamination not known Use of contaminated water for irrigation Use of inorganic fertilisers Contamination via air pollution	Pesticides, Nitrates, ammonium,
Air Pollution	Country wide	Car exhaust Recovery of gold from amalgamated mercury Refrigeration and Air conditioning Servicing workshops Vehicle body work shops spraying paints Dumpsites Cleaning facilities	Mercury Lead Carbon Monoxide Paints Solvents
Hazardous Waste Disposal	Country wide	Lack of proper disposal facilities Poor storage Lack of awareness	Phosphates, Nitrates, Mercury
Occupational Health	2,3,4,5,6,10	Lack of awareness of potential dangers of chemicals Lack of knowledge on proper storage, handling, use and disposal of chemicals Lack of safety gears Lack of regular medical check up	All chemicals
Storage and Disposal of	Country wide	Lack of proper disposal facilities	All chemicals

obsolete chemicals		Expired chemicals Improper storage facilities Unlabelled pesticides Seized chemicals of unknown composition Importation of low quality chemicals	
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3.1 Operational Concerns related to Chemical Management

Each stage in the chemical life cycle can make significant contributions to social and economic development of the country, but also has the potential to impact negatively on various areas of development. The main concerns with the activities at the different stages of the life cycle of chemicals are directly related to the associated health, environmental and economic implications.

Chemicals are present in all segments of human life, in all stages of the life cycle from production, treatment processing, distribution, storing, transport and use, to chemical waste management and disposal.

Chemicals that are produced, traded and used in Guyana can be placed in three broad categories i.e. industrial, agricultural and consumer/household chemical products.

3.2 Contamination of Ground Water

Ground water quality may be at risk of contamination from agricultural activities, industrial facilities, hazardous waste generation with improper storage facilities, urban development, domestic waste disposal, mining activities, and hospital waste generation and improper disposal.

3.3 Coastal and Marine Pollution

Improper use and disposal of contaminants from agricultural activities, mining and industrial facilities carries the potential for degradation of aquatic and water quality for both coastal and marine ecosystems that can be detrimental to plant and animal life especially in mangroves which serves as a key habitat and can pose a medium and long term problem for the fisheries sector.

3.4 Chemical Residues in Food

There are concerns about the potential dangers of the increasing amounts of toxic chemicals being imported into developing countries such as Guyana.

The limited expertise and experience in identifying poisoning by toxic chemicals will probably result in most incidents going undetected and unreported. Misuse of pesticides can lead to excess pesticides remaining on agricultural products leading to health problems. In addition, monitoring for chemical residues in foods and the environment is not conducted, although mechanisms are in place for the monitoring of residues.

3.5 Air Contamination

The incineration of solid waste produces air pollutants via the combustion process that can lead to poor air quality and resulting in health problems associated with respiration. The same could also be said for uncontrolled burning of plant materials in houses and in general other forms of burning that can be associated with the production of furans and dioxins, which are hazardous materials that is persistent organic pollutants.

3.6 Hazardous Waste Disposal

The improper disposal of untreated effluent from industrial facilities, and waste oils in the drainage system, pose a threat to human and environmental health.

The disposal of hazardous waste, including chemical wastes, remains a challenge for the country.

The origin of the chemical waste and the manner in which they are managed varies. Industrial chemical wastes, for example, are mostly stockpiled for indefinite periods. In some cases, this waste is inappropriately stored thereby posing a threat to human health and the environment.

Residual household chemicals are not separated from the remainder of domestic waste and is disposed of in the municipal garbage and sent to the country's disposal sites, which are classified as sanitary landfills. The non-segregation of household chemical waste at source or at the country landfill sites poses potential occupational health and safety as well as environmental risks.

There is also the problem of the interim storage and ultimate disposal of chemicals seized by the competent local authorities.

3.7 Storage and Disposal of Obsolete and Expired Chemicals

The safe disposal of obsolete and expired chemicals is a major concern. There is a lack of or minimal information on the presence, type, size and location of such chemicals. Long-term storage of chemicals can result in containers being damaged and degraded, with the potential for leakage and contamination of the environment.

Guyana does not have any centralized or dedicated hazardous waste storage, treatment or disposal facility. Hence, the country is restricted in its ability to dispose of its chemical wastes in an environmentally sound manner. Due to the lack of appropriate facilities for the disposal of chemical wastes, these substances are either stored at the site of generation or are indiscriminately disposed.

There is need for dedicated facilities to store and treat chemical wastes, particularly the more toxic substances. There is also the need to upgrade the landfill site to a sanitary landfill to include a hazardous waste cell or to develop a sanitary landfill with the requisite infrastructure to manage some categories of the chemical wastes.

3.8 Occupational Health and Safety

Chemical production of household/consumer chemicals have been increasing over the years. This is most evident in paint production which is primarily influenced by the increased activities in the construction industry. However, while the increase in production will stimulate economic development, this brings about serious concerns in the area of occupational health.

There are several challenges related to the enforcement of occupational health safety standards (such as the use of protective gears), which at times are disregarded or are poorly enforced or non-existent in some production facilities. If workers continue to handle toxic chemicals without adequate protection and a clear understanding of the chemical hazards there is the potential risk of chemical exposure. This seems to be very common in small gold mining activities with exposure to mercury contamination at all stages of production.

There is minimal sensitivity to the importance of personal protective equipment (PPE) in the agricultural, household and industrial sectors.

Training, education and public awareness is minimal and need to be increased at all levels. In acknowledgement of this need, the PTCCB has been working persistently with key stakeholders to increase public awareness at all levels, but more specifically at grass roots level through public interactive forums.

3.9 Environmental Pollution of Land and Inland Water

The use of mercury for gold mining activities in the hinterland regions poses severe risk to the environment, wild and aquatic life and land pollution. Also, improper disposal of pesticides and household containers lead to such pollution.

3.10 Priority Concerns Related to Chemical Production, Import, Storage and Use

The levels of concern and priority rankings were determined with input of stakeholders participating in the National Consultation on Chemicals Management for Developing an Integrated National Programme for the Sound Management of Chemicals and SAICM Implementation in Guyana which was held in July 2009. A preliminary list of potential problems was determined by the participants, and were then evaluated as a group, with the use of a scale of medium, high, and low, while the level of concern that they attributed to each identified problem area were determined by the potential for negative environmental and human health impacts. The participants also assigned each area of concern with a priority ranking. Concerns deemed to be in the most pressing need for attention were ranked as 1, or high priority, while lesser immediate concerns were assigned lower rankings of 2 or 3 as may be the case. Several issues for which data is unavailable have been assigned a high priority ranking, representative of the urgent need for data to allow for evaluation of the scope of the problems identified. It must be mentioned that, due to a lack of statistical data, it is difficult to prioritise the problems objectively.

Table 3.B Priority Concerns Related to Chemicals

<i>Nature of Problem</i>	<i>Scale of Problem</i>	<i>Level of Concern</i>	<i>Ability to control problem</i>	<i>Availability of Statistical Data</i>	<i>Specific Chemicals Creating Concerns</i>	<i>Priority Ranking</i>

<i>Air Pollution</i>	National	Medium	Low	No data available	Mining and Agriculture burning	4
<i>Pollution of Inland Waterways</i>	National	High	Low	No data available	Mercury	1
<i>Marine Pollution</i>	National	Medium	Low	No data available	All chemicals	3
<i>Ground Water Pollution</i>	National	Medium	Low	No data available	Pesticides	3
<i>Soil Contamination</i>	National	Low	Medium	No data available	Mercury	4
<i>Chemical residues in Food</i>	National	High	Medium	No data available	Pesticides	1
<i>Hazardous Waste Treatment/Disposal</i>	National	High	Medium	No data available	Industrial chemical	2
<i>Occupational Health: Agriculture</i>	National	High	Medium	No data available	Pesticides	2
<i>Occupational Health: Industrial</i>	National	Medium	Medium	No data available	Industrial Chemical	3
<i>Public Health</i>	National	Medium	Medium	No data available	Pesticides	4
<i>Chemicals Accidents: Transport</i>	National	Low	High	No data available	All Chemical	5
<i>Storage/Disposal of Obsolete Chemicals</i>	National	Medium	High	No data available	Aldrin	5
<i>Chemical Poisoning/Suicides</i>	National	Medium	Low	No data available	Pesticides	4
<i>Persistent Organic Pollutants</i>	National	High	Medium	No data available	PCB's	3
<i>Others</i>						

3.11 Problems Areas Identification and Prioritization.

High priority concerns are pollution of inland water ways through gold mining activities, chemical residues in food, hazardous waste treatment and disposal, occupational health in agriculture, and persistent organic pollutants.

Problems of medium ranking include air, marine and ground water pollution from industrial and other activities such as power generating plants, occupational health in industries, public health, storage and disposal of obsolete chemicals, and chemical poisoning associated with suicides.

Other problems in the environmental area are soil pollution and chemical accidents during transportation.

The problems are addressed by the responsible agencies and relevant regulatory bodies, namely the Pesticides and Toxic Chemicals Control Board,

the Environmental Protection Agency, Guyana Geology and Mines Commission, Ministry of Health, the Department of Food and Drugs and the Occupational Health and Safety Department of the Ministry of Labour.

In reality, an effective management scheme at the national level requires a strong coordinating endeavour. This is justifiable as a high priority need, since chemical management has become a major issue that can affect trade in agricultural commodities as well as economic expansion and social security.

3.12 Waste Generation and Pollution

The generation of waste in industries is monitored by the EPA, who in the initial process provides recommendations to the generators to reduce environmental pollution. A management strategy has been developed to be implemented by the Environmental Protection Agency. The strategy is currently under intense consideration for implementation. This will provide the necessary infrastructure for the improved management of waste generation and pollution in Guyana.

3.13 Comments / Analysis

Generally, there is insufficient or no data available to facilitate informed conclusions and decisions regarding the priority concerns for Guyana in relation to chemical production, trade, use, waste generation and disposal.

Some of the missing data and gaps are as follows:

- (a) Comprehensive inventories documenting on persistent toxic substances and other chemicals have not yet been compiled in Guyana. Hence, a complete understanding of the prevalence of these substances and their deleterious effects is lacking;
- (b) Data to determine the relationship between national levels of environmental contamination and human health;
- (c) Inventories on mercury, lead and cadmium; and
- (d) Pollutant Release and Transfer Register (PRTR).

An ongoing national monitoring and inventory programme is required to facilitate the provision of adequate comprehensive information to determine what suitable strategies for implementation to address the identified concerns.

Chapter 4

Legal Instruments and Non-Regulatory Mechanism for Managing Chemicals

4.0 Introduction

This chapter provides an overview of the existing legal instruments and non-regulatory mechanisms for managing chemicals, including their implementation and enforcement, and to identify relevant strengths, weaknesses and gaps.

4.1 National Legislative and Non-Regulatory Framework

4.10 National Legislation

There are several pieces of legislation that are specifically concerned with the management of chemicals, wholly or partially, in Guyana. These legislations are as follows:

- (a) Environmental Protection Act 1996;
- (b) Environmental Protection (Air Quality) Regulations 2000;
- (c) Environmental Protection (Hazardous Waste Management) Regulations 2000;
- (d) Environmental Protection (Water Quality) Regulations 2000;
- (e) Food and Drug Act 1971;
- (f) Guyana Energy Agency Act 1997;
- (g) Guyana Geology and Mines Act;
- (h) Ministry of Trade Act;
- (i) Narcotic Drug and Psychotropic Substances (Control) Act;
- (j) Occupational Health and Safety Act;
- (k) Pesticides and Toxic Chemicals Control Act 2000;
- (l) Pesticides and Toxic Chemicals (Amendment) Regulations 2007;
- (m) Pesticides and Toxic Chemicals Control (Amendment) Act 2007
- (n) Pesticides and Toxic Chemicals Regulation 2004;
- (o) Petroleum and Petroleum Products Regulations 2004;
- (p) Pharmacy and Poison Ordinance 1956; and
- (q) Sulphuric Acid Act 1928.

<i>Legal Instrument</i>	<i>Responsible Ministry or Agency</i>	<i>Chemical Use Categories Covered</i>	<i>Objective of Legislation</i>	<i>Relevant Section</i>	<i>Resources Allocated</i>	<i>Enforcements / Ranking</i>
<i>(i) Pesticides and Toxic Chemicals Control Act (No. 13 of 2000)</i>	Pesticides and Toxic Chemicals Control Board	Pesticides	To regulate the manufacture, importation, exportation, transportation, storage, sale, use and disposal of pesticides and toxic chemicals, and to provide for the establishment of the Pesticides and Toxic Chemicals Control Board, and its functions and secretariat .	Section 7, 11 - 35	Budget and manpower adequate	Effective
<i>(ii) Pesticides and Toxic Chemicals (Amendment) Act 2007 (No. 13 of 2007)</i>		Toxic Chemicals				
<i>(iii) Pesticides and Toxic Chemicals Regulations 2004 (No. 8 of 2004)</i>		Industrial Chemicals				
<i>(iv) Pesticides and Toxic Chemicals (Amendment) Regulation 2007 (No. 8 of 2007)</i>		Disinfectants Detergents Paints				
<i>Occupational Safety and Health Act 1997 (No. 32 of 1997)</i>	Ministry of Labour	Occupational safety and health at work	To provide for the registration and regulation of industrial establishments, for occupational safety and health of persons at works	Section 10 – 14, 59 - 74	Budget and manpower inadequate	Fair
<i>Food and Drug Act 1971 (No. 12 of 1971)</i>	Food and Drug Department	Drugs and Cosmetics Consumer chemicals	To provide for foods, drugs, cosmetics and therapeutic devices.	Section 9 - 32	Budget and manpower inadequate	Fair
<i>Pharmacy and Poison Ordinance 1956 (No 36 of 1956)</i>	Food and Drug Department	Pharmaceuticals and pharmaceutical products Drugs Poisons Consumer chemicals	To provide for the control of drugs and poisons	Section 25 – 38	Budget and Manpower inadequate	Fair
<i>Environmental Protection Act 1996 (No. 11 of 1996) via a Memorandum of Understanding for its implementation in the Mining Sector</i>	Guyana Geology and Mines Commission	Mining Mercury Cyanide	To provide for the management, conservation, protection and improvement of the environment, the prevention or control of pollution, the	Section 4, 19 -29	Budget and Manpower inadequate	Fair

<i>Legal Instrument</i>	<i>Responsible Ministry or Agency</i>	<i>Chemical Use Categories Covered</i>	<i>Objective of Legislation</i>	<i>Relevant Section</i>	<i>Resources Allocated</i>	<i>Enforcements / Ranking</i>
<i>Petroleum Act 1930 (No. 7 of 1930)</i>	Guyana Energy Agency	Petroleum Products Methylated spirits Ether Carbon bisulphide Carbide of calcium	assessment of the impact of economic development on the environment and the sustainable use of natural resources. To regulate the importation, storage and sale of petroleum.	Section 2 - 10, 19 - 21	Budget and manpower adequate	Effective
<i>Narcotic Drug and Psychotropic Substance (Control) Act 1988 (No. 2 of 1988)</i>	Ministry of Home Affairs	Precursor chemicals used in Production of Narcotic Drugs	To provide for the management of precursor chemicals for the production of narcotic drugs and psychotropic substances.	Section 15 A - 15 C Fourth Schedule	Budget and manpower adequate	Effective
<i>Environmental Protection Act 1996 (No 11 of 1996)</i> <i>Environmental Protection (Hazardous Waste Management) Regulation 2000 (No. of 2000)</i> <i>Environmental Protection (Air Pollution) Regulation 2000 (No. of 2000)</i> <i>Environmental Protection (Water Quality) Regulation 2000 (No. of 2000)</i>	Environmental Protection Agency	Waste generation and environmental pollution Air Emissions Water Emissions	To provide for the management, conservation, protection and improvement of the environment, the prevention or control of pollution, the assessment of the impact of economic development on the environment and the sustainable use of natural resources.	Section 4, 19 -29	Budget and manpower inadequate	Fair
<i>Sulphuric Acid Act 1928 (No. 7 of 1928)</i>	Ministry of Home Affairs	Sulphuric Acid	Management of importation, storage, removal and sale of sulphuric acid	Section 3 - 9	Budget and manpower adequate	Effective
<i>Trade Act 1958 (No. 34 of 1958)</i>	Ministry of Trade	Ozone Depleting Substances (ODS)	To provide for the maintenance and regulation of supplies and for other matter incidental - use to control the use and import of ODS.	Section 3 - 9	Budget and manpower adequate	Effective

4.2 Summary Description of Key Legal Instruments Relating to Management of Chemicals

4.21 Pesticides and Toxic Chemicals Control Act, Its Amendment and Regulations

(i) Pesticides and Toxic Chemicals Control Act 2000 (No 13 of 2000)

The management of chemicals in Guyana is governed by the Pesticides and Toxic Chemicals Control Act 2000 (No.13 of 2000). This Act provides for the establishment of the Pesticides and Toxic Chemicals Control Board, which comprise representatives from the Ministry of Agriculture, Ministry of Health, Environmental Protection Agency and other representatives from the private sector and non-governmental organisation. The maximum number of directors on the Board is seven.

All major decisions of the Board are made through a consultative process involving key stakeholders throughout the country. The Pesticides and Toxic Chemicals Control Regulations 2004 (No. 8 of 2004) were developed through this consultative process. These Regulations outline the management process for pesticides and toxic chemicals in Guyana.

A Secretariat has been established for the management of pesticides and toxic chemicals with the administrative head being the Registrar of Pesticides and Toxic Chemicals. The Registrar is supported by a number of Inspectors. The Secretariat is tasked with responsibility for licensing, registration, training, inspection and enforcement.

All chemicals used in Guyana must be registered by the Board. The decision to register or not is done based on registration submission to the Board. The relevant documentation are examined along with international guidance and previous decisions emanating from international agencies such as the Food and Agricultural Organisation of the United Nations (FAO), United Nations Environmental Programme (UNEP), Stockholm Convention on Persistent Organic Pollutants (POPs), the Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals in International Trade, European Union and United States of America Environmental Protection Agency (US EPA).

The Principal functions of the Board are:

- (a) to register pesticides and toxic chemicals;

- (b) to license persons to import or manufacture registered pesticides and toxic chemicals;
- (c) to authorise persons to sell restricted pesticides;
- (d) to register premises in which a restricted pesticide may be sold;
- (e) to license pest control operators;
- (f) to consider and determine applications made pursuant to the Act and to deal with all aspects of the importation, manufacture, transportation, storage, packaging, preparation for sale, sale, use and disposal of pesticides and toxic chemicals, and to advise the Minister on all matters in relation thereto; and
- (g) to advise the Minister on matters relevant to the making of regulations under this Act, and to monitor the implementation of the regulations.

Part IV of the Act, Registration and Licences, provides for registration, storage, sale, import, licensing, prohibition and restriction of pesticides and toxic chemicals.

The Board is powered to establish any committee to improve the management of pesticides and toxic chemicals as outlined in Section 9 of the principal Act.

Section 34 of the Act provides for dealing with offences and penalties and includes fines and imprisonment commencing from five thousand dollars and three month imprisonment for a first offence and ranging to five hundred thousand dollars and three years imprisonment for subsequent offences.

(ii) Pesticides and Toxic Chemicals (Amendment) Act 2007 (No. 13 of 2007)

This Amendment provides for the regulating of exports and accession to international Agreements governing pesticides and toxic chemicals management by providing for the adoption of Agreements containing legally binding instruments.

(iii) Pesticides and Toxic Chemicals Regulations 2004 (No. 8 of 2004)

These Regulations were established under Section 32 of the Act and provide the instruments and requirements for the implementation of the Act in the following areas:

- (a) Pesticide and Toxic Chemical Registration and Classification Procedure;
- (b) Pesticide labelling;
- (c) Certification of Pesticide Applicators;
- (d) Pesticide Manufacturing and Distribution Certificate;

- (e) Experimental Pesticides and Toxic Chemicals Studies;
- (f) Transportation, Storage, Disposal and Recall of Pesticides and Toxic Chemicals;
- (g) Ministerial Emergency Registration and Exemptions;
- (h) Pesticide Residues; and
- (i) Pesticide Worker Protection.

All pesticides used in Guyana must be registered by the Board and only the registrant of a pesticide is allowed to import that chemical.

Registration of a pesticide requires the submission of the complete formula and a full description of the tests made and the results upon which the potency claims of the pesticide are made. Data submitted includes the following:

- (a) Physical characteristics;
- (b) Chemical characteristics;
- (c) Chemical composition;
- (d) Toxicological properties;
- (e) Certified Limits of the ingredients;
- (f) Environmental fate;
- (g) Toxicity data;
- (h) Foliar dissipation; and
- (i) Soil dissipation data.

Under the Regulations, all information submitted is treated as confidential and can only be shared with the public with the written authority of the registrant.

Pesticides are classified as Prohibited, Restricted or General Use.

A prohibited pesticide is not allowed for use and is classified based on toxicity, use pattern under local conditions and the respective decisions of the following international agencies:

- (a) United Nations Food and Agricultural Organisation (FAO);
- (b) Rotterdam Convention;
- (c) Stockholm Convention;
- (d) United Nations Environmental Programme; and
- (e) World Health Organisation.

A restricted pesticide is permitted for use only on certain stated crops and is classified based on the following:

- (i) the pesticide, as formulated, has an acute oral LD₅₀ of 50 mg/kg or less;
- (ii) the pesticide, as formulated, has an acute dermal LD₅₀ of 200 mg/kg or less;
- (iii) the pesticide, as formulated, has an acute inhalation LC₅₀ of 0.05 mg/l or less, based upon a 4-hour exposure;
- (iv) the pesticide, as formulated, is corrosive to the eyes or causes corneal irritation persisting more than 21 days;
- (v) the pesticide, as formulated, is corrosive to the skin causing scarring or tissue destruction;
- (vi) the pesticide, as diluted for use, has an acute dermal LD₅₀ of 15 g/kg or less;
- (vii) when used in accordance with label directions or widespread and commonly used practice, the pesticide may cause significant sub-chronic toxicity, chronic toxicity or delayed toxic effects on man, as a result of single or multiple exposures to the product ingredients or residues;
- (viii) under normal conditions of label use or widespread and commonly recognized practice, the pesticide causes discernible adverse effects on non-target organisms such as significant mortality or effects on the physiology, growth, population levels or reproductive rates of such organisms, resulting from direct or indirect exposure to the pesticide, its metabolites or degradation products; or
- (ix) any other factor that poses a serious risk of causing human injury or environmental harm despite the normal labelling restrictions, packaging requirements and other cautions as determined by the Board

Under the Regulations, chemicals can only be sold from certified premises while the sale of restricted chemicals must be carried out only at premises approved for the sale of such types of chemicals.

Enforcement of the Act and its associated Regulations is done through the inspectorate of the Board. The Inspectorate is divided into two sections, the inspection and registration section and the enforcement and training section. The enforcement mechanisms available under the Regulations are notice of warning, civil penalties, stop sale, use or removal order, seizure, injunction and criminal proceedings.

Information of the activities of the Board is publicly available on the internet at <http://www.ptccb.org.gy> and covers prohibited, restricted and registered products along with information on monthly import of any chemical into Guyana, vending premises, legislations, reports, and news pertaining to current and ongoing developments. Other methods of dissemination of information include the publication of a Quarterly Newsletter, and the use of the print and television Media for public and general notices.

Under the Pesticides and Toxic Chemicals Control Act 2000, the relevant Amendment and associated Regulations, the following chemicals are currently registered, for use in Guyana, by the Pesticides Board:

Name of Chemicals	Type	Common Name	Registration
Syngenta Co. Ltd			
Amistar 50WG	Fungicide	Azoxystrobin	General Use
Gramoxone Super	Herbicide	Paraquat Dichloride	General Use
Krismat	Herbicide	Ametryn	General Use
Fusilade	Herbicide	Fluazifop-p-butyl	General Use
Touchdown IQ	Herbicide	Glyphosate	General Use
Dual Gold 960EC	Herbicide	S-Metolachlor	General Use
Igran 500SC	Herbicide	Terbutryn	General Use
Reglone	Herbicide	Diquat Dibromide	General Use
Actara 25WG	Insecticide	Thiamethoxam	General Use
Demon MaX	Insecticide	Cypermethrin	General Use
Ninja 5EC	Insecticide	Lambda Cyhalothrin	General Use
Trigard 75WP	Insecticide	Cyromazine	General Use
Vertimec 1.8EC	Insecticide	Abamectin	General Use
Match 50EC	Insecticide	Lufenuron	General Use
Engeo	Insecticide	Thiamethoxam & Lambda Cyhalothrin	General Use
Pegasus 500Sc	Insecticide	Diafenthiuron	General Use
Daconil 720Sc	Insecticide	Chlorothalonil	General Use
Demand 2.5CS	Insecticide	Thiamethoxam & Lambda Cyhalothrin	General Use
Klerat Wax Blocks	Rodenticide	Brodifacoum	General Use
Actellic 50Ec	Insecticide	Pirimiphos methyl	General Use
Dupont Chem. Co			
Kocide 101	Fungicide	Hexazinone	General Use
Mankocide	Fungicide	Mancozeb & Copper Hydroxide	General Use
Manzate 75DF	Fungicide	Mancozeb	General Use
Velpar DF 25%	Herbicide	Hexazinone	General Use
Velpar DF 75%	Herbicide	Hexazinone	General Use
Karmex DF	Herbicide	Diuron	General Use
Vydate L	Insecticide	Oxamyl	General Use

Lannate L	Insecticide	Methomyl	General Use
Lannate LV	Insecticide	Methomyl	General Use
Rentokil Initial			
Bromard	Rodenticide	Bromadialone	General Use
Bromatrol Concentrate	Rodenticide	Bromadialone	General Use
Difenard	Rodenticide	Difenacoum	General Use
Fentrol Concentrate	Rodenticide	Difenacoum	General Use
BASF			
Bellis 38WG	Fungicide	Pyraclostrobin & Boscalid	General Use
Herbadox 40Ec	Herbicide	Pendimethalin	General Use
Arsenal 24Sc	Herbicide	Imazapyr	General Use
Pirate 24Sc	Insecticide	Chlorfenapyr	General Use
Storm 0.005BB	Rodenticide	Brodifacoum	General Use
Acrobat MZ 69WP	Fungicide	Mancozeb & Dimethomorph	General Use
Insecticidas Internacionales			
Designee 40Sc	Herbicide	Bispyribac Sodium	General Use
Mentor EC	Herbicide	Fenoxaprop-p-ethyl	General Use
Batazo 80PM	Herbicide	Diuron	General Use
Cyper 25EC	Insecticide	Cypermethrin	General Use
Sofion 200Sc	Insecticide	Fipronil	General Use
Inimectin	Insecticide	Avermectin	General Use
Inithion 57	Insecticide	Malathion	General Use
Inisan 60SC	Insecticide	Monocrotophos	General Use
Glyfosan	Herbicide	Glyphosate	General Use
Thionil 35EC	Insecticide	Endosulfan	General Use
Tropel 40EC	Insecticide	Triazophos	General Use
Danol 60Ec	Insecticide	Diazinon	General Use
Aminex 720	Herbicide	2,4 D Amine	General Use
Propanol 360EC	Herbicide	Propanil	General Use
Torpedo 350EC	Insecticide	Chlorpyrifos & Cypermethrin	General Use
Amidor	Insecticide	Methamidophos	General Use
Biesterfeld Chemical Company			
Alpha Cypermethrin 5Ec	Insecticide	Alpha Cypermethrin	General Use
Metolachlor 960g/l	Herbicide	S-Metolachlor	General Use
Paraquat	Herbicide	Paraquat Dichloride	General Use
Excel Ag. Corporation			
Assex 80%DF	Herbicide	Asulam	General Use
Therminex 2.5%SC	Insecticide	Fipronil	General Use
Swift Gel	Insecticide	Fipronil	General Use
Agil 100EC	Herbicide	Propaquizafop	General Use

Fifa 20%SC	Herbicide	Glufosinate ammonium	General Use
Aval 20%SP	Insecticide	Acetamiprid	General Use
Agree 50WP	Insecticide	Bacillus Thuringiensis	General Use
Flip 800DF	Insecticide	Fipronil	General Use
Assex 40%SL	Herbicide	Asulam	General Use
Bayer CropScience			
Merlin 75WG	Herbicide	Isoxaflutole	General Use
Antracol 70WP	Fungicide	Propineb	General Use
Verita 71.1 WG	Fungicide	Fenamidone & Fosetyl-al	General Use
Larvin 37.5 SC	Insecticide	Thiodicarb	General Use
Sevin 85WP	Insecticide	Carbaryl	General Use
Estallion 13.75WG	Herbicide	Ethoxysulfuron & Indosulfurom methyl	General Use
Atul Limited			
2,4 D Amine Salt 720g/l	Herbicide	2, 4 D	General Use
Lambda Cyhalothrin 5%EC	Insecticide	Lambda Cyhalothrin	General Use
Metsulfuron Methyl 60WDG	Herbicide	Metsulfuron Methyl	General Use
Imidacloprid 17.8%	Insecticide	Imidacloprid	General Use
Indoxacarb 15%SC	Insecticide	Indoxacarb	General Use
Agro-Care Chemical Industry Group Limited			
Fastak 5EC	Insecticide	Alpha Cypermethrin	General Use
Chlorpyrifos TC	Insecticide	Chlorpyrifos	General Use
Leafguard	Insecticide	Cyromazine	General Use
Sev7en 85%	Insecticide	Carbaryl	General Use

(iv) **Pesticides and Toxic Chemicals (Amendment) Regulation 2007 (No. 8 of 2007)**

This Amendment provides the instruments for regulating exports of pesticides and toxic chemicals.

4.22 Environmental Protection Act and its Associated Regulations

(i) **Environmental Protection Act 1996 (No 11 of 1996)**

The Environmental Protection Act provides for the management, prevention and control of environmental pollution. One of the functions of the Agency as delineated in the Act is “to prevent and control environmental pollution” and “formulate standards and codes of practice to be observed for the improvement and

maintenance of the quality of the environment and place limits on the release of contaminants into the environment”.

Part V of the Act deals with the Prevention and Control of Pollution, which examines the discharge or permits the entry of any contaminant into the environment whether it is solid, liquid or gas and covers the amount and concentration of the contaminant.

In the mining sector, the Guyana Geology and Mines Commission, in compliance with a Memorandum of Understanding with the Environmental Protection Agency, is responsible for the implementation of some Sections of the Environmental Protection Act 1996 and the associated Regulations.

Implementation of the Environmental Protection Act and its associated Regulation is the responsibility of the Environmental Management Division of the Environmental Protection Agency.

Information on the activities of the Environmental Protection Agency is publicly available on the Agency’s website <http://www.epaguyana.org>. The Agency also has a public awareness unit that is responsible for disseminating information on its activities via the publication of public notices and environmental messages through the print and broadcasting media. The unit also focuses on the development of suitable information brochures and posters for students and the general public.

(ii) Environmental Protection (Hazardous Waste Management) Regulations 2000

These Regulations covers the management of waste including chemical waste and cover industrial, commercial and any other activity that produces waste. Some of the key activities which are covered under the Regulations are generation, treatment and disposal of hazardous waste. The Regulations is read and construed as being in addition to, and not in contravention of the Pesticides and Toxic Chemicals Control Act 2000 (No. 13 of 2000). Based on the definition all chemical wastes including persistent organic pollutants (POPs) are covered under these Regulations for the purposes of management.

Under the Regulations, disposal is defined as “the discharge, deposit, injection, dumping or placing of any hazardous waste into or on any land so that it may enter the environment, be emitted into the air or discharged into any waters, including

groundwater”, whereas hazardous waste is any “waste or combination of wastes which, because of its quantity, concentration or physical, chemical or infectious characteristics, may pose a substantial hazard to human health, and belong to any category contained in Schedules I, unless they do not contain any of the characteristics contained in Schedule II and includes waste that is hazardous industrial waste, acute hazardous waste chemical, hazardous waste chemical, severely toxic waste, flammable waste, corrosive waste, reactive waste, radioactive waste, clinical waste, leachate toxic waste or polychlorinated biphenyl waste.

Permits are required for the generation of waste which is/are are monitored throughout the production, storage, transport and release phases. The waste streams on which focus is centred for control are as follows:

- (a) Clinical Wastes from medical care in hospitals, medical centres and clinics;
- (b) Wastes from the production and preparation of pharmaceutical products;
- (c) Wastes from the production , formulation and use of biocides and phytopharmaceuticals;
- (d) Waste pharmaceuticals, drugs and medicines; and
- (e) Wastes from the manufacture, formulation and use of wood preserving chemicals.

More specifically, wastes containing the following constituents are controlled:

- (i) Metal carbonyls;
- (ii) Beryllium, beryllium compounds;
- (iii) Hexavalent chromium compounds;
- (iv) Copper compounds;
- (v) Zinc compounds;
- (vi) Arsenic, arsenic compounds;
- (vii) Selenium, selenium compounds;
- (viii) Cadmium, cadmium compounds;
- (ix) Antimony, antimony compounds;
- (x) Tellurium, tellurium compounds;
- (xi) Mercury, mercury compounds;
- (xii) Thallium, thallium compounds;
- (xiii) Lead, lead compounds;
- (xiv) Inorganic fluoride compounds excluding calcium fluoride;
- (xv) Inorganic cyanides;
- (xvi) Acidic solutions or acids in solid form;
- (xvii) Basic solutions or bases in solid form;
- (xviii) Asbestos (dust and fibres)\Organic phosphorous compounds;

- (xix) Organic cyanides;
- (xx) Phenols, phenol compounds including chlorophenols;
- (xxi) Ethers;
- (xxii) Halogenated organic solvents;
- (xxiii) Any congener of polychlorinated bibenzo-furan;
- (xxiv) Any congener of polychlorinated dibenzo-p-dioxin; and
- (xxv) Organohalogen compounds.

Environmental Protection (Air Quality) Regulations 2000;

These Regulations were formulated to protect the air quality and provide the necessary infrastructure for controlling the amount of contaminants by stipulating specific allowable levels of emissions that are released into the atmosphere at any given time.

Parameters are specified for the following contaminants:

- (a) Smoke;
- (b) Solid Particles;
- (c) Sulphuric acid mist or sulphuric trioxide;
- (d) Fluoride compounds;
- (e) Hydrogen chloride;
- (f) Chlorine;
- (g) Hydrogen sulphide;
- (h) Nitric acid or oxides of nitrogen; and
- (i) Carbon monoxide.

Environmental Protection (Water Quality) Regulations 2000

These Regulations were developed to manage the discharge of waste matter into inland and coastal water bodies. They provide for minimizing the contamination of potential and existing water supply sources.

Limits are specified for the following substances:

- (a) Ammonical Nitrogen;
- (b) Sulphate;
- (c) Chloride;
- (d) Cobalt;
- (e) Colour;
- (f) Detergents, Anionic;

- (g) Fluoride (as F);
- (h) Molybdenum;
- (i) Phosphate (as P);
- (j) Polychlorinated Biphenyls;
- (k) Selenium;
- (l) Silver;
- (m) Beryllium;
- (n) Vanadium;
- (o) Radioactive Material;
- (p) Nitrate Nitrogen;
- (q) Temperature;
- (r) Pesticides, fungicides, herbicides, insecticides, rodenticides, fumigants or any other biocides or any other chlorinated hydrocarbons; and
- (s) A substance that either by itself or in combination with other waste or refuse may give rise to any gas, fume or odour or substance which causes or is likely to cause pollution

4.23 Guyana Energy Agency Act 1997 (No. 31 of 1997)

This Act provides for the establishment of the Guyana Energy Agency (GEA) with responsibility for the management of the energy sector in Guyana and including petroleum and petroleum products.

Information on the activities of the Agency is available on its website at <http://www.gea.org.gy>.

The Legal and Licensing Division of the Agency is specifically tasked with enforcing the Laws and Regulations governing all activities involving petroleum and petroleum products in Guyana. The Division grants and issues licences to all individuals, companies and agencies that import, wholesale, retail, store, transport in bulk quantity, or otherwise deal with petroleum and petroleum products. Licences are issued after a site visit is conducted to ensure compliance with the Regulations and approved standards.

Marking of fuels is governed by the Fuel and Marking Division of the Agency in accordance with the the associated provisions enshrined in the **Guyana Energy Agency Act 1997** as amended by the **Guyana Energy Agency (Amendment) Act 2004**, **Guyana Energy Agency (Amendment) Act 2005**, and the **Petroleum and Petroleum Products Regulations 2004**.

4.24 Petroleum Act 1930 (No. 7 of 1930)

The Petroleum Act 1930 provides for the establishment of regulations for the management of importation, storage, sale and use of petroleum and petroleum products in Guyana.

This Act is management by the Guyana Energy Agency.

4.25 Petroleum and Petroleum Products Regulations 2004

These Regulations provides the instruments for the management of petroleum and petroleum products under the Guyana Energy Agency Act 1997.

The Regulations provide for licensing of persons and companies to import, retail, wholesale, store, and transport of petroleum and petroleum products.

4.26 Trade Act 1958 (No. 34 of 1958)

The **National Ozone Action Unit** was established under the Montreal Protocol for the management of Ozone Depleting Substances (ODS). This Unit is affiliated with and exists within the Hydrometeorological Department of the Ministry of Agriculture. The importation of ozone depleting substances is governed under the Trade Act 1958 (No. 34 of 1958). Section 3 of this Act provides for the establishment of a competent authority by the Minister for the management and control of any relevant programmes. The National Ozone Action Unit was appointed as the competent authority for the management of ozone depleting substance under Section 3 of this Act.

Under Section 5 of the Trade Act 1958, the Minister, by Order, provides for the importation and exportation of goods of any class. The Minister of Trade, Industry and Commerce, through the Trade Order 2007 (No. 19 of 2007) - Restrictions on Import of Ozone Depleting Substances - have determined the ODS controlled in Guyana.

The following ODS are controlled under the Minister's Order: Trichlorofluoromethane; Dichlorofluoromethane; 1,1,2-Trichlorotrifluoroethane; Carbon tetrachloride; Dichlorotetrafluoroethane; Monochloropentafluoroethane; Methyl Chloroform; Bromochlorodifluoromethane; Bromotrifluoromethane; Dibromotetrafluoroethane; Bromochloromethane; and Methyl Bromide.

4.27 Food and Drug Act 1971

The Food and Drugs Act 1971 provides for the control of drugs and cosmetics. Implementation of This Act is vested in the Food and Drug Department. The Act provides for the control of chemicals used in the disinfection of premises or control of vermin in food premises; and in the control of plants and disease pests. The Act also covers importation, standards and misleading representation.

The Act is administered through the Inspectorate Division of the Department.

4.28 Narcotic Drug and Psychotropic Substances (Control) Act 1988 (No. 2 of 1988)

This Act provides for the control of precursor chemicals for the production of narcotics. It covers transportation, labeling and record keeping for precursor chemicals. It also delineates the precursor chemicals managed in the Fourth Schedule. The chemicals listed are as follows:

- (a) N-Acetylantranilic acid;
- (b) Acetic anhydride;
- (c) Acetone;
- (d) Anthranilic acid;
- (e) Benzene;
- (f) Benzyl chloride;
- (g) Benzyl cyanide;
- (h) 2-Butanone (methyl ethyl ketone);
- (i) Ephedrine;
- (j) Ergonovine;
- (k) Ergotamine;
- (l) Ethyl ether;
- (m) Hydrochloric Acid;
- (n) Methylene chloride;
- (o) 3,4 Methylene-dioxphenyle-2-propanone;
- (p) Norpseudo ephedrine;
- (q) Phenylacetone acid;
- (r) Phenylacetone;
- (s) Piperidine;
- (t) Potassium permanganate;
- (u) Pseudo ephedrine;
- (v) Sulphuric acid;
- (w) Toluene;

- (x) 1-Phenyl-2-propanone;
- (y) Phenylacetic acid and its salt;
- (z) Phenylpropanolamine;
- (aa) Bromobenzyl cyanide;
- (bb) Lysergic acid;
- (cc) Ergometrine and its salt;
- (dd) Sodium sulphate;
- (ee) Potassium carbonate;
- (ff) Sodium carbonate;
- (gg) Isosafrol;
- (hh) Piperonal;
- (ii) Safrole; and
- (jj) Methyl ethyl ketone.

This Act is administered by the Guyana Police Force supported by the Food and Drug Department with respect to the declaration of the chemical products imported.

The Guyana Police Force has a website, <http://www.guyanapoliceforce.org> but no information on these chemicals is posted.

4.29 Occupational Safety and Health Act 1997 (No. 32 of 1997)

The provisions for registration and regulation of industrial establishments and for occupational safety and health of persons at work are enshrined in the Occupational Safety and Health Act 1997. The Act covers hazardous chemicals at workplaces which can endanger the health of workers, and allows for the limited or restricted use of such chemicals. It also covers the introduction of new chemicals in the workplace.

This Act provides for a hazardous material inventory to be kept by the employer covering the following:

- (i) Toxic properties, both acute and chronic health effects in all parts of the body;
- (ii) Chemical and physical characteristics of the chemical;
- (iii) Corrosive and irritant properties;
- (iv) Allergenic and sensitizing effects;
- (v) Carcinogenic effects;
- (vi) Teratogenic and mutagenic effects;
- (vii) Effects on the reproductive systems;
- (viii) Labeling of the chemical;

- (ix) Provision of material safety data sheet; and
- (x) Instruction and Training in the chemicals used.

Implementation of this Act is the responsibility of the Occupational Safety and Health Department of the Ministry of Labour.

4.210 Pharmacy and Poison Ordinance 1956

Pharmaceuticals, drugs and poisons are governed by the Pharmacy and Poison Ordinance 1956 (No. 36 of 1956), and is managed through a registration and licensing process controlled by the Food and Drug Department.

The Ordinance provides the names of the chemicals and the form of sale allowed in the Guyana.

4.211 Sulphuric Acid Act 1928

The management of sulphuric acid is covered under the Sulphuric Acid Act 1928 (No. 7 of 1928). This Act regulates the importation, storage, removal and sale of the acid. Importation, sale, transport and storage are governed by the Commissioner of Police. A license is required for each activity.

Table 6.B: Overview of Legal Instruments to Manage Chemicals by Use Category

Category of Chemical	Importation	Production	Storage	Transport	Distribution/Sale	Use & Handling	Disposal
Pesticides	X	X	X	X	X	X	X
Fertilisers							
Industrial Chemicals (used in manufacturing and processing facilities)	X	X	X	X	X	X	X
Petroleum Products	X	X	X	X	X	X	X
Consumer Chemicals	X	X	X	X	X	X	X
Chemical Wastes	X	X	X	X	X	X	X
Others (Paints and Detergents)	X	X	X	X	X	X	X

4.3 Description Of Key Approaches And Procedures For Control Of Chemicals

The key policy and procedures used to control the entry of various classes of chemicals in Guyana is to prohibit or restrict the importation or manufacture of the chemical or class of chemical in question. At present, the classes of chemicals that are directly controlled by legal instruments are pharmaceuticals, ozone depleting

substances and pesticides. These classes of chemicals are controlled by three legal instruments, namely the Pharmacy and Poison Ordinance, the Trade Act and the Pesticides and Toxic Chemicals Control Act 2000.

The chemicals listed under the Trade (Restrictions on Import of Ozone Depleting Substances) Order 2007 (No. 19 of 2007) are listed below in Table 4C.

Name of Chemical	Level of Restriction (ban (B) or severe restriction (SR))	Details of Restriction
Trichlorofluoromethane	Restricted	Ozone Depleting Substance - listed under the Montreal Protocol
Dichlorofluoromethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
1,1,2-Trichlorotrifluoroethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Dichlorotetrafluoroethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Monochloropentafluoroethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Bromochlorodifluoromethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Bromotrifluoromethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Dibromotetrafluoroethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Bromochloromethane	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Methyl Chloroform	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Carbon tetrachloride	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol
Methyl Bromide	Restricted	Ozone Depleting Substance- listed under the Montreal Protocol

The Pesticides and Toxic Chemicals Control Board, through its principal Act, has prohibited/restricted the use of a twenty five chemicals of which twenty three are prohibited, one restricted and the other will only be made available (upon request) to the Ministry of Health. The list of chemicals is shown in Table 4D. The entire chemical list under the Rotterdam and Stockholm Convention is governed by the Board.

Name of Chemical	Level of Restriction (ban (B) or severe restriction (SR))	Details of Restriction
2,4,5-T and its salt and esters	Prohibited	Persistent effect on the environment and has bioaccumulation potential. The substance also forms toxic contaminants such as 2,3,7,8-TCCD which has carcinogenic and teratogenic properties
Aldrin	Prohibited	Organochlorine pesticide with a high mammalian toxicity is persistent and can bioaccumulate in the food chain and body tissues of man
Captafol	Prohibited	Has caused dermatitis (contact and allergic) in man. There are also reported cases of severe irritation of the respiratory tract with exposure along with eye damage and other systemic effects.
Chlordane	Prohibited	Highly toxic to human and animals as well as being persistent and is bioaccumulative with the possibility of being carcinogenic.
Chlordimeform	Prohibited	principal metabolites are considered probable human carcinogens
Chlorobenzilate	Prohibited	Carcinogenic effects on mammals, with risk of cancer and adverse testicular effect.
Dieldrin	Prohibited	Persistent in the environment and bioaccumulate in the food chain
Dinoseb	Prohibited	High risks of birth defects and male sterility in animal studies and high acute toxicity
1-2-Dibromoethane	Prohibited	Health concerns and persistence of the chemical especially in groundwater. High acute toxicity also with possibility of reproductive, carcinogenic and genotoxic effects.
Fluoroacetamide	Prohibited	High acute toxicity to man, other mammals and birds
Heptachlor	Prohibited	Persistent in the environment and bioaccumulate in the food chain

Hexachlorobenzene	Prohibited	Persistent in the environment and bioaccumulate in the food chain
Lindane	Prohibited	Persistent in the environment and bioaccumulate in the food chain
Mercuric chloride	Prohibited	Toxic to man, aquatic organisms, and residues accumulate in the aquatic biota
Methyl Parathion	Prohibited	Acute hazard classification and concern as to their impact on human health under conditions of use in Guyana
Mirex	Prohibited	Human carcinogen and is persistent in the environment
Parathion	Prohibited	Acute hazard classification and concern as to their impact on human health under conditions of use in Guyana
Pentachlorophenol	Prohibited	High toxicity to human and animals. Developmental and reproductive effects and liver and kidney pathology were noted in animal studies. However, the compound is also highly toxic to aquatic organisms. Pentachlorophenol contains several highly toxic dioxins which have shown carcinogenic effects in experimental animals.
Phosphamidon	Prohibited	Acute hazard classification and concern as to their impact on human health under conditions of use in Guyana
Toxaphene	Prohibited	Risk to human health related to the use
Tributyltin	Prohibited	Compounds are moderately to highly persistent organic pollutants that bioconcentrate up the marine predators' food chain
Mixed Isomers of Hexachlorocyclohexane	Prohibited	Possible oncogenic effects in combination with persistence and bioaccumulation.
Endrin	Prohibited	Persistent and toxic to man

Phosphine	Restricted	Concern on the possible health effects that can arise out of the use of the fumigant (formulation) as a rodenticide
DDT	Severely Restricted	Approved for use only by the Ministry of Health for malaria control in accordance with WHO stipulations

4.4 Regulatory Instruments for Related Activities which Impact on Chemicals Management

There are no known regulatory instruments that have an impact on the life cycle management of chemicals in Guyana.

4.5 Comments / Analysis

The management of chemicals is covered under the Pesticides and Toxic Chemicals Control Act 2000 (No. 13 of 2000), its amendment, the Pesticides and Toxic Chemicals Control (Amendment) Act 2007 (No. 13 of 2007), their Regulations, the Pesticides and Toxic Chemicals Control Regulations 2004 (No. 8 of 2004), its amendment, the Pesticides and Toxic Chemicals (Amendment) Regulations 2007 (No. 8 of 2007). Under the principal act, pesticide is defined as *“any substance or mixture of substances intended for preventing, destroying or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animal causing harm during or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural and industrial commodities, wood and wood products, or animal feedstuffs or which may be administered to animals for the control of insects, arachnids or other pests in or on their bodies but the term does not include any anti-septic, disinfectant or drug”* and toxic chemical is defined as *“any disinfectant or any other substance known to be poisonous, corrosive, irritating, sensitizing or harmful to man or animal that is used in agriculture, the arts, commerce or industry, or for any domestic or other purpose, other than any antiseptic, drug or pesticide”*. Based on these two definitions all chemicals are managed under this Act with the exception of pharmaceuticals, antiseptics and drugs.

A number of overlaps exist with respect to the chemicals classified as precursor chemicals which are governed under the Narcotic Drug and Psychotropic Substances (Control) Act - which is managed by the Ministry of Home Affairs in collaboration with the Food and Drug Department.

Whilst, sulphuric acid is governed by the Sulphuric Acid Act 1928 (No 7 of 1928) and is managed by the Commissioner of Police, this chemical would be classified as a toxic chemical under the Pesticides and Toxic Chemicals Control Act 2000. This Act does not make a determination or reference to this chemical (sulphuric acid) so the overlap will continue until a legal reference is made.

This overlap is further exemplified under the Food and Drugs Act 1971 (No. 12 of 1971) where a drug is defined as *“any substance or mixture of substances manufactured, sold or represented for use in (a) the diagnosis, treatment, mitigation or prevention of a disease, disorder, abnormal state of health, or the symptoms thereof, in man or animal; (b) restoring, correcting or modifying organic functions in man or animal; (c) disinfection in premises in which food is manufactured, prepared, preserved, packaged or stored for sale or sold, or for the control of vermin in such premises; or (d) the control of plants or animal pests.”*

Notwithstanding the above, by virtue of a Memorandum of Understanding with the Food and Drug Department, the management of pesticides and toxic chemicals is the sole responsibility of the Pesticides and Toxic Chemicals Control Board, with the exception of the precursor chemicals and sulphuric acid. The management of these two named chemicals is the responsibility of the Ministry of Home Affairs and the Food and Drug Department of the Ministry of Health.

There is a lack of legislation for the management of fertiliser in Guyana. Whilst this category of chemical is licensed by the Ministry of Agriculture’s Plant Health Unit and the Chief Crops and Livestock Officer; the Ministry of Trade; and the Food and Drug Department. The current system of management is leading to poor reporting with a lack of coherence between the various departments where no one wants to take the lead and responsibility for the precise management and data collection required for proper management of fertilisers. Legislation is under development for remedying this situation where the establishment of the Plant Health Unit as a semi autonomous unit by law will lead to the legal management of fertilisers firmly under the Ministry of Agriculture.

Enforcement of the existing legislation is restricted due to inadequate human resources and administrative challenges, especially within some of the key Agencies. Further, a number of other factors severely hinder the effective enforcement of some of the Regulations. These include an inadequate number of trained inspectors and inadequate budgetary allocations. Efforts are now concentrated on the training and retaining inspectors by way of offering longer term contracts.

Chapter 5

Ministries, Agencies and Other Institutions Managing Chemicals and Waste

5.0 Introduction

This chapter describes and analyzes the mandates and programmes of different Ministries, Agencies and other governmental institutions responsible for, and concerned with, various aspects of chemicals management.

5.1 Responsibilities of Different Government Ministries, Agencies and Other Institutions

Table 5.A provides a general overview of Ministerial responsibilities and activities related to chemicals management for each stage of the chemical life cycle from production / import through disposal. Each cell of the table provides an indication of which government ministry has responsibility for control of various stages of the chemical life cycle.

Table 5 : Responsibilities of Government Ministries, Agencies and Other Institutions

Life Cycle Agency	Importation	Production	Storage	Transport	Sale	Use & Handling	Disposal
PTCCB	X	X	X	X	X	X	X
GEA	X	X	X	X	X		
EPA							X
Customs*	X						
Occupational Safety and Health						X	
Home Affairs	X		X	X			
F & D	X	X			X		
GGMC			X			X	X
Ozone Unit	X						

* refers to the Department of Customs and Trade Administration of the Guyana Revenue Authority

Table 5 A: Responsibilities of Government Ministries, Agencies and Other Institutions – Pesticides

Life Cycle Agency	Importation	Production	Storage	Transport	Sale	Use & Handling	Disposal
PTCCB	X	X	X	X	X	X	X
EPA							X
Customs	X						

Table 5 B: Responsibilities of Government Ministries, Agencies and Other Institutions - Petroleum Products

Life Cycle Agency	Importation	Production	Storage	Transport	Sale	Use & Handling	Disposal
GEA	X	X	X	X	X		
EPA							X
Customs	X						
Occupational Safety and Health						X	

Table 5 C: Responsibilities of Government Ministries, Agencies and Other Institutions - Industrial Chemicals

Life Cycle Agency	Importation	Production	Storage	Transport	Sale	Use & Handling	Disposal
PTCCB	X	X	X	X	X	X	X
Home Affairs	X		X	X			
F & D	X	X			X		
EPA							X
GGMC			X			X	X
Customs	X						
Occupational Safety and Health						X	

Table 5 D: Responsibilities of Government Ministries, Agencies and Other Institutions - Consumer Chemicals

Life Cycle Agency	Importation	Production	Storage	Transport	Sale	Use & Handling	Disposal
PTCCB	X	X	X	X	X	X	X
Home Affairs	X		X	X			
F & D	X	X			X		
EPA	X						X
Ozone Unit	X						
Customs	X						
Occupational Safety and Health						X	

5.2 Description of Ministerial Authorities

Brief descriptions of the responsibilities and activities of each Ministry / Agency mentioned in Table 5 are presented below. Where applicable, reference is made to the relevant subsidiary Agency(ies) with specific responsibility for, or involvement in chemicals management at the national level.

5.2.1 Pesticides and Toxic Chemicals Control Board

The Pesticides and Toxic Chemicals Control Board, which was established under the Pesticides and Toxic Chemicals Control Act 2000, is the authority responsible for the management – importation, production, transportation, use, disposal and storage - of pesticides and toxic chemicals in Guyana. By definition, all chemicals such as pesticides, industrial chemicals, disinfectant, detergents, and paints and paint products are managed by this Agency.

This Agency is also responsible for the implementation of the Stockholm Convention of Persistent Organic Pollutants, the Rotterdam Convention on the Prior Informed Consent on Hazardous Chemicals in International Trade, and the Strategic Approach for International Chemical Management in Guyana.

Resources are allocated through the Ministry of Agriculture via subvention. This is used along with administrative fees rendered on the importation of pesticides and toxic chemicals. The resources allocated are considered to be adequate based on the Board's current activities involved with chemical management.

The Board is staffed with expertise in technical fields such as chemistry, environmental science, environmental toxicology, agriculture science and biology. The qualification ranges from first degree to second degree.

5.2.2 Ministry of Home Affairs

The Ministry of Home Affairs is responsible for the management of precursor chemicals and sulphuric acid. However, importation of these chemicals is managed by the Food and Drug Department of the Ministry of Health.

5.2.3 Guyana Energy Agency

The Guyana Energy Agency was established under the Guyana Energy Agency Act 1997 (No. 31 of 1997), and is responsible for the management of petroleum and petroleum products in Guyana. Budgetary allocation is considered adequate and released through parliamentary allocation along with licensing fees for storage and

other facilities. The expertise of the staff is broad ranging and includes chemical engineering, chemistry and other technological fields.

5.2.4 Food and Drug Department

The Food and Drug Department of the Ministry of Health is responsible for the management of drugs, poisons, and pharmaceuticals. The Department is also responsible for the management of precursor chemicals in conjunction with the Ministry of Home Affairs and the Guyana Police Force. Budgetary allocation is considered inadequate. The staff of the Departments is broad ranging in their expertise which includes pharmacy, chemistry, public health and food chemistry.

5.2.5 Guyana Geology and Mines Commission

The Guyana Geology and Mines Commission, through a Memorandum of Understanding with the Environmental Protection Agency, is responsible for the implementation of the Environmental Protection Act in the mining sector, and has the overall responsibility for the management of mercury and cyanide specifically.

5.2.6 Ministry of Labour's Occupational Safety and Health Department

Under the Occupational Safety and Health Act, the Ministry of Labour's Occupational Safety and Health Department regulates matters concerning health and safety in the workplace for workers.

5.2.7 Environmental Protection Agency

The Environmental Protection Agency was established under the Environmental Protection Act 1996 (No. 11 of 1996), and is tasked with the maintenance of the environment in a safe and healthy condition. The Agency works cohesively with the relevant Ministries and other Departments and Agencies to implement the environmental Regulations at the national level. The Agency is currently implementing environmental Regulations and standards in the mining, forestry and agriculture sectors via the respective memoranda of understanding.

The Guyana Geology and Mines Commission is responsible for the implementation of the Environment Act and its associated Regulations in the mining sector. This

Agency is tasked specifically with the management of mercury and cyanide in the gold mining sector.

The implementation of the Basel Convention on the Transboundary Movement of Hazardous Waste is the responsibility of the Environmental Protection Agency.

The staff is mostly qualified in Biology, Chemistry and Environment Science and resources is considered inadequate.

5.2.8 Department of Customs and Trade Administration

The Department of Customs and Trade Administration of the Guyana Revenue Authority does not have a licensing or permitting influence over chemicals in Guyana. However, this Agency is responsible for accepting licenses issued by the other Agencies and carries out the first activity of the inspection process pertaining to the entry of chemicals in Guyana.

5.2.9 Ministry of Agriculture's National Ozone Action Unit

The National Ozone Action Unit is subsumed within the Hydro Meteorological Office of the Ministry of Agriculture, and is responsible for the management of ozone depleting substances in Guyana.

The Unit is also responsible for the implementation of the requirements of the Montreal Protocol, and for reporting under the said Protocol for Guyana.

5.3 Comments / Analysis

Collectively, the various Ministries involved with chemicals management, either directly or indirectly, ensure that all aspects of the life cycle management of chemicals are addressed. Each Ministry has clearly defined mandates, and where legislation exists, the responsibilities of the Ministries are clearly stipulated. Nonetheless, there are a few instances of overlapping mandates among some of the Departments within the respective Ministries. The most notable example of overlapping mandates is that of Ministry of Home Affairs, the Pesticides and Toxic Chemicals Control Board, the Food and Drug Department and the Occupational Safety and Health Department of the Ministry of Labour.

A case in point is that the Pesticides and Toxic Chemicals Control Board and the Ministry of Home Affairs both have responsibility for some type of chemicals,

especially the precursor chemicals and sulphuric acid. Another example is that the Board, in compliance with the Workers Protection Regulations, and the Department and Occupational Safety and Health Section of the Ministry of Labour, address chemical management in the context of occupational health and safety in workplaces.

These overlapping can best be handled by transferring all the responsibilities for chemicals to the Pesticides and Toxic Chemicals Control Board since they are the Agency best equipped to manage these chemicals and already has the legal, financial and operating mechanism in place. However, the relationship with the Ministry of Labour would have to be inclusive in light of the labour requirement for the International Labour Organisation (ILO). Operations should be carried in a joint effort with no duplication and reports submitted to both agencies by their inspectorate or inspections carried out with the presence of representatives from both agencies agreed jointly so as to reduce expenditure but not burden the other.

Chapter 6

Relevant Activities of Industry, Public Interest Groups, and the Research Sector

6.0 Introduction

This chapter describes and review the activities of non-governmental bodies and entities which support national efforts to manage chemicals.

6.1 Non Governmental Stakeholders in the Chemical Industry

In addition to Government Ministries, Departments, and Statutory Boards, there are a number of other agencies that are considered as primary stakeholders in the chemicals industry in Guyana. These consist of the following:

6.11 Guyana Rice Producers Association

The Guyana Rice Producers Association (GRPA) is a non governmental body that looks after the interest of rice farmers and provides training in the management of pesticides with respect to the welfare of the farmers in the use and management of pesticides in rice production. The GRPA was established to protect, promote and advance the interest of rice farmers.

6.12 Pesticide and Toxic Chemical Importers

All the importers of chemicals are concerned with the proper use and management of pesticides. They also provide training in appropriate use and management of pesticides in agricultural production. Simple levels of chemical comparison in field are done by most companies to promote their products. These companies are strongly supported by their suppliers who provide protective gears and measuring equipment for farmers to assist in the proper use of chemicals.

6.13 Labour Unions

The labour unions are all involved in the management of chemicals in their respective areas. The Guyana Agricultural and General Workers Union (GAWU) is the largest trade union in Guyana. This Union has successfully represented workers rights in the sugar industry for the implementation of personal protective and safety equipment for workers, including chemical applicators.

6.2 Non Governmental Organisations

Non Governmental Organisations (NGOs) and other civic entities which support national efforts to manage chemicals are mostly in embryonic stages. However, environmental organisations are now beginning to play a significant role in public education and advocacy pertaining to environmental issues. There are currently fewer than ten NGOs with an interest in environmental matters. Though limited in number, these NGOs have been involved mainly in the monitoring of the actions of companies in forestry and mining. The most common contribution of all NGOs is in the area of public awareness and environmental education.

6.21 Beacon Foundation

Beacon Foundation is primarily an urban based NGO that is involved in social work but they have been known to provide agricultural inputs and training to farmers of the hinterland.

6.22 Red Thread

The Red Thread is a community group which organises poor, rural and semi-rural based women in economic activities for wider development and income generation. Some of the work of the group has a direct relevance to the use of chemical in agricultural production.

6.23 Guyana Agricultural Producers Association

The Guyana Agricultural Producers Association (GAPA) is an informal group without any legal status whose main function is to look into the problems of small farmers, except those that produce rice. This Agency was dormant in the past but has been resuscitated in 2009. This Agency provides training to farmers in chemicals management and addresses their concerns in the field of chemicals management.

6.24 Guyana Cane Farmers Association

The Guyana Cane farmers Association was set up to represent the interest of small cane farmers, particularly with respect to prices, grading and support services. This Association, which became dormant for several years, has been replaced by the National Cane Farming Committee.

6.25 Canadian Hunger Foundation (CHF)

The Canadian Hunger Foundation (CHF) is a non-profit organization dedicated to enabling poor rural communities in developing countries to attain sustainable livelihoods.

CHF is recognized as a leader in international development and is responsible for the implementation of the Future Fund Project which was funded by the Canadian Government. This project included the training of rural farmers and householders in the management of pesticides in Guyana.

6.26 Institute for Private Enterprise Development

The Institute for Private Enterprise Development (IPED), which is a financial institution established with support from the USAID, has provided technical training to farmers and farm workers in the management of pesticides in agricultural production.

6.27 Society for Sustainable Operational Strategies

The Society for Sustainable Operational Strategies is an Agency that conducts trials in crop production utilising chemicals provided by donor agencies. Chemical evaluation is not an optimal part of their activities, but is strategic in the agricultural sector.

6.28 Guyana Consumers Association

The Guyana Consumer Association monitors consumer welfare and is the watch dog for consumers, especially pertaining to the quality and standards of consumer goods, and including some monitoring of consumer chemicals. However, the Association's overall interest in the management of chemicals is minimal to non-existent.

6.3 Public Interest Groups

Public interest groups have emerged with focus on specific issues concerning chemicals hazards and safety management such as occupational health and safety, industrial pollution, social and environmental justice, agricultural alternatives, and clean technology. Their activities encompass information dissemination, research and out reach, monitoring, campaigning for community rights and community capacity building.

6.4 Research Institutions

6.41 University of Guyana

The University of Guyana teach and conduct academic and research activities, related to chemistry and/or chemical use in diverse aspects including chemical safety and environmental protection. Specifically, the School of Earth and Environmental Science focuses on environmental toxicology and health risk assessment from pollution and chemical contamination.

6.42 Guyana School of Agriculture

The Guyana School of Agriculture (GSA) is an educational institution designated for the training students and farmers in agricultural practices and production. The School offers this in the form of Diploma and Certificate programmes. Minor research of pesticide effects on weeds in some crops are carried out by this institution.

6.43 Rice Research Station

The Guyana Rice Development Board's Rice Research Station conducts evaluation of herbicides and screening of pesticides for rice cultivation. This organisation also conducts some research activities on pesticides that are relevant for the rice sector, but this is based on chemicals submitted by manufacturing and importing agencies for experimental trials to be done at the research station. This Agency's chemicals research programme is for rice production only and the research personnel are usually specialists in rice research.

6.44 Agricultural Research Centre

The Guyana Sugar Corporation's Agricultural Research Centre evaluates herbicides response in sugar cane production as a pre-emergent, early post and post emergent. The Centre also evaluates for herbicide compatibility to develop combination for broad leaf and grass control.

Research on biological control of insect pest of sugar cane is also carried out at this Centre.

Field evaluation of rodenticide and response to the pesticide is also carried out at this research institution. This Centre is responsible for specialised research for the sugar industry.

6.45 National Agricultural Research Institute

The National Agricultural Research Institute (NARI) is the responsible body for research in pesticides for the agricultural sector with the exception of rice and sugar. The Institute is mandated to conduct evaluation and screening of pesticides for crop production in Guyana.

6.5 Comments / Analysis

There is present in Guyana a limited number of non-governmental stakeholders and interest groups in chemicals management issues. However, to some extent the knowledge and skills present in these organisations are not being fully and efficiently utilised in regards of national chemicals management. The expertise held in nongovernmental organisations could be of great benefit if adequately integrated into the development and implementation of a comprehensive national chemicals management programme. Further to this, several of the agencies included in this chapter have linkages with regional and international organisations, and these linkages offer opportunities to access and take advantage of wider pools of resources and information.

Any national plan or programme to strengthen the chemicals management framework in Guyana would be enhanced by provisions for the establishment of formal linkages and cooperation between governmental agencies and mechanisms and non-governmental chemicals management stakeholders.

Particular benefits could be reaped in the areas where non-governmental agencies have a wealth of expertise, such as monitoring and data collection, training and education, and awareness raising.

NGOs should be encouraged to establish public interest group in chemicals management issues and the leading players should be the Guyana Consumers Association since chemicals are a consumer concern in the food imported and those produced locally. The establishment of the group can be tied to similar regional and international watchdog group such as International POPs Elimination Network (IPEN) and using resources available within similar agencies. These Groups can work with the already established Regulations that have determined the safety standards of pesticides in food using the local maximum Residue Limits as well as Codex Standards for food used and produced in Guyana.

Chapter 7

Inter-Ministerial Commissions and Coordinating Mechanisms

7.0 Introduction

This chapter describes and analyze mechanisms which facilitate co-ordination and cooperation among Ministries, Agencies and other relevant governmental and non-governmental bodies in particular areas of chemicals management

7.1 Available Mechanisms

Nationally, there are two mechanisms available for facilitating cooperation among various agencies and organizations in executing tasks within the scope of chemical management. These coordinating mechanisms are established as might be deemed necessary:

1. Inter-Ministerial bodies, appointed by the Cabinet to undertake policy formulation, monitoring and evaluation. No Inter-Ministerial body is currently in existence.
2. Standing Committees have been established, by legislative Acts, to regulate and manage chemicals in various aspects throughout their life cycle. The Pesticides and Toxic Chemicals Control Board is such a body.

Since the establishment of the Pesticides and Toxic Chemicals Control Board in 2000, there has been no need to utilise any of the abovementioned mechanisms for the management of chemicals in Guyana. Under the Act, the Board can establish a committee to assist in any particular area of chemical management about which the Board feels that it is not adequately knowledgeable.

The Board of Directors of the Pesticides and Toxic Chemicals Control Board is legislatively comprised of at least one representative from the Environmental Protection Agency, the Ministry of Agriculture and the Ministry of Health. The composition of the Board allows for decisions reflecting the interest of all the participating Agencies. Further, the need for broad based involvement and led to the development of Memoranda of Understanding (MOU) with other key Agencies involved in the management of chemicals.

MOUs were signed with the Food and Drug Department of the Ministry of Health, the Department of Customs and Trade Administration and the Ministry of Trade, Industry and Tourism.

The MOU with the Department of Customs and Trade Administration, which was signed on the 27th August 2001, allow for the provision of training to custom officers to enable them to understand pesticide labels. The Board also agreed to the provision of any information requested by Customs for pesticides used in Guyana and the Department agreed to accept licenses issued by the Board for the importation of pesticides.

Both Agencies agreed to monitor trade protocols, regulations and guidelines involved with the trade of pesticides and toxic chemicals and to develop and implement appropriate inter-agency coordinating mechanisms.

The MOU with the Ministry of Tourism, Industry and Commerce was signed on the 4th September 2001 and provides for the sound practices pertaining to the licensing of chemicals for importation into Guyana to be implemented by the PTCCB, as well as for the provision of information to the Ministry on quantity and value of pesticides imports.

The Ministry accepted the Board's autonomy in the management of pesticides and transferred responsibility for the licensing process for pesticides to the Board.

Both Agencies agreed to further develop and implement appropriate inter-agency coordination mechanisms to improve the management of pesticides and toxic chemicals

The MOU with the Food and Drug Department was signed on the 28th August 2001, and provides for the PTCCB to (i) implement sound practices relative to the management and licensing of chemicals for use and importation into Guyana, and (ii) provide information to the Department on the quantity and value of pesticide imports.

The Food and Drug Department, on the other hand, agreed to continue monitoring of the Narcotic Drug and Psychotropic Substance Act.

Both Agencies agreed to develop and implement appropriate Inter-Agency coordinating mechanisms to improve the management of pesticides and toxic

chemicals as well as the monitoring of food associated with the diverse usage of pesticides and toxic chemicals.

7.2 Comments / Analysis

Generally, Inter-Ministerial Commissions and co-ordinating mechanisms function effectively relative to their roles in addressing pertinent aspects of chemicals management. Stakeholders from the respective Ministries are normally represented on the various Committees and Boards, and where additional input from governmental and nongovernmental agencies is needed, adequate actions taken with the objective of ensuring that the needs are met.

There are, however, some challenges that hinder the operations of these Inter-Ministerial Commissions and co-ordinating mechanisms. The most prominent of those are outlined as follows:

- (i) it is not unusual for administrative issues to impact negatively on the operations of some of the mechanisms resulting in prolonged periods of inactivity; and
- (ii) each mechanism is independent, thus the sharing of information occurs at a reduced scale. Consequently, the mechanisms do not always benefit from nor compliment each others' information.

The current inter-ministerial coordinating mechanism referred to as the Pesticides and Toxic Chemicals Control Board has shown that once the mandate and the responsibilities are clearly defined. This Board has been operating since 2000 and there have never been any problems with its operations. This Group is given the political support required since the group is named by the Minister of Agriculture and is supported by the secretariat with clearly defined functions with their own office space and technological and financial resources.

The Group is mandated that if the need should arise (under what ever circumstances) they have the legal authority to establish a committee or committees that will provide a determination as required on any issue that they may define and the members of the group can be drawn from any institution of Government, private sector or any agency within the country as the need may require. To date this Group has never found it necessary to convene another similar mechanism for any purpose facing them. In this regard it can be accepted that the Group is functioning effectively and efficiently.

Chapter 8

Data Access and Use

8.0 Introduction

This chapter provides an overview of the availability of data for chemicals management and the related infrastructure, and to analyze how information is used for national and local chemical risk reduction.

8.1 Availability of Data for National Chemicals Management

Data access and use are important in many aspects, particularly in policy formulation and decision-making as they relate to national and local chemical risk reduction. Table 8.A provides an overview of the availability of data for decision making and other activities that may be required as part of a chemicals management programme; and identifies the Agencies responsible for gathering the various types of data listed. An “X” indicates that sufficient data is available, but not necessary in a simple format but in a technical format.

Table 8A: Quality and Quantity of Available Information

Data Needed for	Pesticides*	Industrial Chemicals	Consumer Chemicals	Chemical Waste
Priority Setting	X		X	X
Assessing Chemicals Impact under local conditions	X		X	
Risk Assessment	X	X	X	
Classification / Labelling	X	X	X	X
Registration	X			
Licensing	X	X	X	
Permitting	X	X	X	X
Risk Reduction Decisions	X			
Accident Preparedness and Response	X	X	X	X
Poisoning Control	X			
Emissions Inventories				X
Inspections and Audits (Environmental and / or Occupational Health and Safety)				
Information to Workers	X	X	X	
Information to Public	X	X	X	

* include agricultural, public health and consumer use

8.2 Location of National Data

Table 8.B indicates the storage location and retrieval accessibility of national data related to chemicals and chemicals management. It should be noted that it is not known how often the data at these locations are updated and consequently, the data's state is unknown.

Table 8B: Location of National Data

Type of Data	Location (s)	Data Source	Who has Access?	How to gain Access?*	Format
Production Statistics	Manufacturers Producers	Company Records	Government	Write	Paper e-mail
Export Statistics	Statistical Bureau	TRIPS	Public with restriction	Written Request	Database
Chemical Distribution and Use	Importers	Company Records	Government	Write	Paper e-mail
Industrial Accident Reports	Labour Department	Employers	Government Labour Union	Written Request	Paper
Occupational Health Poisoning	Labour Department Ministry of Health	Employers Hospitals Police	Public Public	Written Request Written Request	Paper Paper
PRTR	NA	NA	NA	NA	NA
Hazardous Waste	EPA	Companies	Public	Written Request	Paper
Register of Pesticides	PTCCB	Manufacturer	Public with restriction	Website	Digital
Register of Toxic Chemicals	PTCCB	Manufacturer	Public with restriction	Website	Digital
Inventory of Existing Chemicals	NA	NA	NA	NA	NA
Register of Imports	Statistical Bureau	TRIPS	Public with restriction	Written Request	Paper
Register of Producers	NA	NA	NA	NA	NA
PIC Decisions	PTCCB	Rotterdam Secretariat	Public	Website	Digital

NA - Not Available

* all request is made to the functional Head of the Agency

8.3 Procedures for Collecting and Disseminating National / Local Data

Under the Pesticides and Toxic Chemicals Control Act, registrants wishing to register pesticides in Guyana are required to provide accredited data to the Board relating to the chemistry, toxicity, environment degradation and concerns, target organisms, and efficacy on target and non target organisms.

For chemicals, apart from agro-chemicals regulated by the Pesticides Board, the same information is required with the exception of crop evaluation and other similar studies that are relevant to agriculture, food and feedstuff production.

Although there are a few programmes explicitly targeted towards disseminating information to the public, by and large, the Guyanese public has free access to the decisions of the Board, except in specific cases whereby some information supplied for registration are termed “trade secret” and is classified as confidential and cannot be accessed by the public. The decisions of the Board are compiled in the Annual Report of the Board and are posted on the Board’s website. The information contained in the annual report is presented to Parliament and is publicly available through this means. Importation quantities of chemicals of the year is also included in this report and is used by the Importers for their future management plans.

8.4 Availability of International Literature

Whilst there is a number of International and Regional institutions present in Guyana, they do not make information accessible to the public, but some research institutions and individuals may have access via direct requests and recommendations. While the information is available, it is used by the respective Agencies for research and for internal reference. None of the Agencies have a library for external use, nor a dedicated librarian to offer assistance to the public. However, most International information is available through the websites of the individual organisations.

Literature	Locations	Who has Access?	How to Gain Access?
Environmental Health Criteria Documents (WHO)	PAHO Ministry of Health	Restricted	By Appointment*
Health and Safety Guides (WHO)	PAHO Ministry of Health	Restricted	By Appointment
International Chemical Safety Data Cards (IPCS/EC)	Ministry of Labour PTCCB	Restricted	By Appointment
Decision Guidance Documents for PIC Chemicals (FAO/UNEP)	PTCCB	Restricted	By Appointment
FAO/WHO Pesticides Safety Data Sheets	PTCCB PAHO	Restricted	By Appointment

Documents from the FAO/WHO Joint Meeting on Pesticide Residues	PTCCB Food and Drug Dept.	Restricted	By Appointment
Materials Safety Data Sheets (Industry)	Ministry of Labour PTCCB	Restricted	By Appointment
OECD Guidelines for the Testing of Chemicals	PAHO PTCCB	Restricted	By Appointment
Good Laboratory Practice Principles	Bureau of Standards	Restricted	By Appointment
International Organisation for Standardisation (ISO)	Bureau of Standards	Restricted	By Appointment

* data used under supervision provided by the Agency when available

8.5 Availability of International Databases

Nowadays international databases are accessible through their respective websites by the general public.

There appear to be no designated location(s) where literature on chemicals management can be accessed from international databases such as IRPTC; ILO CIS; IPCS INTOX; Chemical Abstract Services Database; Global Information Network on Chemicals; STN Database or relevant databases for other countries. Consequently, individual persons or entities would have to source such information on their own.

8.6 National Information Exchange Systems

No information is available on national activities, programs or policies which facilitate information flow from international organizations to all concerned parties in Guyana. A system for the exchange of information between Ministries and other government institutions exists and is used for the exchange of national information on chemicals management issues. Whenever necessary, this information is also provided to other concerned parties. This mechanism is available for exploitation by NGOs and Industry but to date its not utilised, however, when the information is such that an impact will be created within industries, these information is made public through the print media.

8.7 Comments / Analysis

There is scope for improvements to the current arrangements for managing information exchange and flow from International Agencies to concerned parties within the country and among the various Ministries, Departments, Agencies and stakeholder groups within the country.

In respect of the flow of information from International organisations to national Agencies, a lack of clarity about which local agency has specific responsibility, or is the focal point, for particular areas of chemicals management can result in information being misdirected to the inappropriate Agency or contact person. This can be improved by convening a meeting with the agencies involved and determine the information needs of each agency so that the flow of information can be corrected and regularise with one of the agency taking the responsibility of providing the clearing house mechanism.

The convening of the abovementioned meeting will also reduce significant delays experienced before the information is received by the Agency best suitable to make use of it.

International literature and databases on chemical safety management are available for accessibility in many formats and systems from universities, government agencies and on the internet. This covers statistical data, research information, data from production enterprises and international information. In acknowledgment of many agencies being mandated to oversee chemical management relevant to their functions, information of chemical management in Guyana are collected and analyzed for specific purposes in accordance with the preferred format of the respective entities, hence is not generally presented in a consistent and comparable fashion.

The National Chemicals Management Profile is expected to highlight this concern and stimulate the creation of a mechanism to promote the availability and reliability of systematic information on a permanent basis. The development of inter-organizational networks that share the responsibility for acquiring quality information without repetitive efforts has been an issue of discussion in the national master plan, but this thrust needs appropriate strategies to expedite the process. Dissemination of the available information to the public for better awareness and understanding is also the key step for safe handling and sustainable consumption of chemical products.

There are acute hurdles to be cleared in attempting to obtain data on chemicals management in Guyana. This should not be interpreted to mean that there is no data; there is data. However, a number of factors contribute to prohibiting access to and effective use of such data. One such factor is the format in which the data is stored. Observation has revealed that data is typically collected in a format which meets the specific requirements of the collecting agency; this format may not be

convenient for use for other purposes or by persons external to the procuring organisation.

Additionally, the type of data collected is also specific to the collecting agency. The Pesticides and Toxic Chemicals Control Board (PTCCB), holds a wealth of information on agricultural chemicals. This is a result of the existence of a clear legislative framework governing the operation of the Board.

The Government Statistical Bureau remains the primary repository of data on chemicals import/production, export and trade. Outside of this department, there only are bits and pieces of data to be found elsewhere, as indicated in Table 8.B.

In respect of other groups of chemicals, which do not fall within the ambit of these two Agencies, difficulty may be encountered in determining which Agency has responsibility for gathering and collating specific types of data.

Chapter 9

Technical Infrastructure

9.0 Introduction

The purpose of this chapter is to provide an overview of the technical infrastructure in Guyana pertaining to the management of chemicals.

9.1 Overview of Laboratory Infrastructure

Guyana has one facility that is capable of providing the chemical analyses required to support the implementation of a chemicals management programme for the country. This laboratory is the Pesticides and Toxic Chemicals Laboratory, which is managed by the PTCCB. The major evaluating equipment in the laboratory is a gas chromatograph / mass spectrometer (GC/MS). This laboratory is working towards local accreditation with the Guyana National Bureau of Standards. The proposal is for the laboratory to utilise methods and guidelines promulgated by the Collaborative International Pesticides Analytical Council (CIPAC) Limited

This laboratory is a multi-purpose facility with the capacity to analyse agrochemical formulations and residues for agricultural produce, soil, water and animal tissues. It possesses the capacity to undertake qualitative and quantitative analyses of pesticides and toxic chemicals. This include (i) analysis to determine the composition of any pesticide and identification of the active ingredients, inert ingredients and other chemical components present within any of the pesticides registered for use in Guyana; (ii) analysis to determine the concentration of the composition of pesticides and to determine the percentage concentration of the active and inert ingredients within a sample, or more specifically, against the information submitted for registration.

The Laboratory possesses the capability to conduct evaluations upon request from any national or regional entity.

There are other laboratories which are operational in Guyana. However, they have been set up to perform specified functions, hence they are not accessible to conduct tasks outside of their mandate. The Food and Drug Department's Laboratory, in particular, is equipped with the facilities to control the quality of imported and manufactured food and drugs. With the exception of a few laboratories, the Guyana

National Bureau of Standards (GNBS) has certified all of the laboratories as being in compliance with the established local standards.

Nationally, there are no programmes available to improve the quality and quantity of laboratories to be able to evaluate pesticides. This can only be done through private sector initiative to capitalise on this sector. Whilst the Government is promoting bilateral and regional relationship, there is no cooperation with respect to sharing laboratory facilities or test results. However, this could be due to the fact that the current laboratory constructed specifically for pesticide analysis is not fully functional but there are regional programmes currently being developed that can be utilised.

9.2 Overview of Government Information Systems / Computer Capabilities

The Pesticides and Toxic Chemicals Control Board has the all encompassing capability to carry out the entire range of activities relevant to chemical management. This includes the development of information systems, databases, inventories and accessing international information databases.

The Board is currently revising the Guyana Pesticides Management Information System (GPMIS), which was originally developed by the Pan American Development Bank, but which failed to generate the desired results.

All of the Government ministries houses varying computer capabilities in the format of desktop single standing computers. As stand alone computers operating in the Windows environment, they are all compatible with each other with facilities to communicate over the internet with others.

9.3 Overview of Technical Training and Education Programmes

Technical training in Government controlled analytical facilities focuses primarily on in-house and external training. In addition, Government departments have formulated and implemented their own internal capacity building programmes.

Opportunities for professional development may also become available through the capacity building components of Regional and International technical assistance and cooperation initiatives through the United National Environment Programme (UNEP) and other similar agencies.

The Stockholm Convention is another Agency that can provide support through the Global Monitoring Plan of POPs for effective evaluation of the Stockholm Convention. One of the primary objectives of project is to train the developing countries on the conduct of POPs analysis in laboratories in accordance with international standards.

The University of Guyana (UG) is the tertiary institution in Guyana which offers courses subjects relevant to chemicals management.

9.4 Comments / Analysis

The current technical infrastructure is inadequate to fully support an effective chemicals management programme. The main weaknesses in the existing infrastructure can be categorised as lack of accreditation and training.

The absence of accreditation can significantly impede the enforcement component that is necessary for any chemicals management initiatives. The Pesticides and Toxic Chemicals Laboratory is working towards accreditation to ISO 17025, with support from the Inter-American Development Bank funded project i.e. the Agricultural Diversification Programme.

Training and ongoing professional development are of paramount importance. Training attachments at labs that routinely monitor for certain compounds, and that are accredited for the associated analyses.

Additional benefits of such attachments include:

- The establishment of relationships with labs that can assist with method development (especially for those methods that accreditation is being sought)
- Development of quality control procedures applicable to the methods
- The opportunity to benefit from the years of experience in problem-solving that these labs have acquired.

It will not always be necessary to have technicians travel overseas. In some cases, it may be more beneficial to have experienced people come in and provide training for more than one person with the equipment currently available at the local facilities.

In addition to the development of equipment, staffing and technical expertise, the technical infrastructure in Guyana would also benefit greatly from the harmonisation of laboratory facilities, their functions and capabilities.

Chapter 10

Chemical Emergency Preparedness, Response and Follow-up

10.0 Introduction

The following is intended to provide an overview of the facilities in Guyana related to preparedness for, response to, and follow-up of, emergencies involving chemicals.

10.1 Chemical Emergency Planning

Appropriate contingency planning by the primary national response agencies is a crucial component to an effective response in any emergency. Guyana's emergency arrangement in the event of a chemical incident is not outlined in any response plan.

A clear and definitive plan needs to be developed with the overall objective of setting a course of action targeted at minimising public and environmental harm in the event of a chemical incident.

Chemical planning and management is included in all Environment Management Plan as part of the permit system granted by the Environmental Protection Agency. Under the Pesticides and Toxic Chemicals Regulations, emergency planning is mentioned with respect to spillage from storage facilities and via transportation.

The Civil Defence Commission of Guyana has a Disaster Preparedness Plan. Under the plan there is a Committee responsible for hazardous materials and toxic waste which caters for hazardous materials and toxic chemicals spills. The Plan provides for an advisory council which is chaired by the Prime Minister of Guyana and includes all the key agencies - Health, Agriculture, Red Cross, Fire Service, Police, Voluntary Organisations, Communication Networks, Media, etc - inclusive of the private sector and regional and international agencies present in Guyana. The Plan also provides for simulated testing and evaluation and based on these responses the plan is modified as required. The Plan is currently being revised with the assistance of the Inter American Development Bank.

There are some major concerns with respect to chemical spills and the available response such as lack of appropriate equipment, improper fire fighting equipment, lack of antidotes for all chemicals used in Guyana and lack of a poison center.

10.2 Chemical Incident Response

There has not been any agrochemical spill in Guyana. However, in August 1995, 3.2 billion litres of cyanide contaminated tailing (28 parts per million (ppm) of sodium cyanide and 1 ppm of copper) were released into the Essequibo River when a dam collapsed at the Omai Gold Mines. Studies by the Pan American Health Organisation showed that all aquatic life in the four kilometres long Omai creek that runs from the mine to the Essequibo River was killed.

The Civil Defence Commission of Guyana is the agency responsible for making plans and conduct operations to deal with all types of disasters in Guyana. There is a National Disaster Preparedness Plan which is currently being updated with funding from the Inter American Development Bank.

10.3 Chemical Incident Follow-Up and Evaluation

There is no national mechanism in place to investigate chemical incidents and their outcomes. Procedures for investigating chemical incidents vary depending of the Agency that is investigating the incident. Consequently, there is no standardized format for collecting information about an incident. It follows therefore that there is also no national register of chemical incidents. However, each agency keeps records of the incidents that it investigates and is responsible for updating its records.

Despite there not being a standardized format for collecting information about an incident, investigations can lead to a formal enquiry into the causes and responsibilities of the parties involved, and prompt follow-up activities.

It should be noted that the cost for clean-up after an incident generally lies with the party or parties responsible for the incident with any necessary technical assistance from the environmental authorities. On the other hand, the costs and responsibility for rehabilitation of person exposed to chemicals who may suffer long term disabilities lies with that person unless some recourse can be found through the courts or a company health insurance scheme.

10.4 Comments/Analysis

The capacity in Guyana to respond to chemical emergencies can be described as insufficient but there is significant room for rapid improvement. Essentially, there needs to be a programme for conducting frequent simulation exercises. This would greatly increase the ability of the relevant Agencies to respond to emergencies and to

be aware of their individual role(s) during such emergencies. The lead agency in the development of an emergency response plan outlining the various cases should be with the Pesticides and Toxic Chemicals Control Board strongly supported by the Ministries of Health, Local Government and Home Affairs. This plan should be incorporated into the current plan that is now being revised.

Further, there is an urgent need for the creation of a dedicated communication system so that status updates on incidents can be exchanged between all of the emergency responders. Currently, the Guyana Police Force and Guyana Fire Service have access to such a dedicated communication system.

The harmonisation of the various coordinating mechanisms would improve the holistic approach to national chemical emergency response and preparedness. At this time, a chemical emergency response and preparedness is non-existent.

Additionally, specific medical facilities should be established to care for persons who are exposed to chemicals.

Chapter 11

Awareness/Understanding of Workers and the Public; and Training and Education of target Groups and Professionals

11.0 Introduction

This chapter provides an overview of the mechanisms available to provide information to workers and to the public concerning the potential risks associated with chemical production, import, export, handling, use and disposal along with the capacity for training and education of target groups affected by chemicals and related waste, and of professionals involved in sound life cycle management of chemicals.

11.1 Awareness and Understanding of Chemical Safety Issues

Workers are considered an important component for sound management of chemicals because they directly handle chemicals in occupational settings. Moreover, the general public, including those who are in the vicinity of chemical industry area, and who are the end-users of chemical products, have the right to gain access to appropriate information that can be applied to their respective situations. Workers and the general public need information to enable them to assess potential risks of chemicals and to make informed decisions. A number of measures have been conducted by government and non-government agencies to provide relevant and comprehensive information about chemical risks in order to raise the awareness and understanding of workers and the public. These measures include operations according to the Regulations, publications, television & radio programs, education, exhibitions and seminars.

The Agencies that lead the way with these activities are the Pesticides and Toxic Chemicals Control Board, Ministry of Agriculture, Guyana Rice Development Board, the Guyana Sugar Corporation, Pan American Health Organisation, Institute for Inter American Cooperation and the Guyana Marketing Corporation.

The Environmental Protection Agency and the Ministry of Health are institutions that provide information to reduce risk to the environment, health and safety. These Agencies also lead in the awareness drive in this sector with focus also placed on waste and hazardous waste management.

The Ministry of Labour examines chemical management issues, particularly occupational health and safety issues and leads the drive with the awareness campaign in this area.

The main legal instrument pertaining to the monitoring and regulation of chemicals in Guyana is the Pesticides and Toxic Chemicals Control Act, which makes provisions for information to be provided to workers and the public through the labelling requirement.

The Regulations also provide for the protection of worker and the rights of employers and employees with the Workers Protection Standard. This Regulation also provide for the workers having the right to determine whether they want to work with a particular chemical and the right to know requirement.

Decision makers and legislators are guided as required by the Pesticides and Toxic Chemicals Control Board and the other related agencies and they are aware of the risks and hazards of chemicals.

11.2 Education and Training for Sound Management of Chemicals and Waste

Both of the post secondary education institutions, the University of Guyana and the Guyana School of Agriculture provide educational programmes in chemistry and environmental studies. The Guyana School of Agriculture offers Certificate and Diploma programmes in agriculture science and forestry to provide students with up to date knowledge of agricultural issues and the basic skills needed to address them. The University of Guyana offers a degree programme in chemistry, agriculture, a course in environmental science, and other courses of lesser relevance to chemical management.

The Pesticides and Toxic Chemicals Control Board is active in the training of farmers throughout Guyana. The training takes the form of interactive presentations and takes into consideration the level of literacy of the farming population. Training is carried out indoors at appropriate locations and covers the following topics:

- (a) legal responsibilities of pesticides in Guyana;
- (b) safe handling and correct use of pesticides;
- (c) common handling practices, storage and disposal of pesticides; and
- (d) Practical demonstrations in the area of the use of personal protective equipment and the safe application of pesticides.

A training manual “Farming with Bohdoo and Bains”, developed by the Board, in cartoon format is used to enhance the training of farmers and is distributed free of cost.

The Board also provides training to extension agents, vendors, and students of the Guyana School of Agriculture (GSA). The training for these are more specific and generally covers the understanding of pesticides and their mode of action, importance of pests and disease identification, monitoring, threshold levels, bio control, cultural control, Integrated Pest Management (IPM), Good Agricultural Practices (GAP) and the importance of personal protective equipment.

Regular training is carried out with members of the Customs and Trade Administration targeting their officers at the ports of entry on the licensing procedures and the importance of their inputs in the management of chemicals as well as the categorisation of pesticides and toxic chemicals.

At the school level, whilst training is not directly provided, guest lectures and discussions are carried out upon requests by secondary schools. Some schools have a pesticides corner in their libraries, which are maintained by the Board through the provision of documents on pesticides and agriculture production in general. This also aids the raising of awareness on the issues governing the use of pesticides in agriculture production.

The board produces a quarterly newsletter, copies of which are distributed free of cost to farmers and other interested persons. The Newsletter covers the activities of the Board and provides information on pests of economic importance in Guyana along with a profile of a pesticide in each edition.

The Board has a website, <http://www.ptccb.org.gy> where all the information is available on the activities of the Board as well as all publication, importation, registered chemicals, restricted chemicals, legislation, vendors, annual report, newsletter and other publications.

Pest Control Operators in Guyana are trained under the training programme of the Board. This training is offered in three categories that cater for applicators through to supervisors.

Participation in Farmers Field School activities are carried out by the Board, especially with the Guyana Rice Development Board (GRDB) and the Rice Producers

Association, for the training of farmers in pest and pesticide management in the rice sector.

The Television call-in Programme hosted by the Ministry of Agriculture i.e. "Farmers Connection" is used by the Board to address issues of concern with respect to pesticides use in the agriculture sector and to raise awareness of pesticides management.

The Pesticides Board also raises awareness on pesticides at national exhibitions through participation and displays.

The print media is utilised to share information on issues of national interest through press releases and public notices.

Training of health professional are carried out by the Ministry of Health through the Chief Medical Officer and the Pan American Health Organisation. The Health professional are part of the emergency response team.

11.3 Comments / Analysis

Currently, there is a dearth of specific policy initiatives to address the need for public awareness and understanding. Although individual organisations may have internal policies with regards to occupational health and safety and the dissemination of information to their workers, this does not diminish the need for a better national policy to promote and encourage greater awareness of the need for sound chemicals management. Employers must be made aware of the need to inform emergency response organisations, such as the Guyana Fire Service, of the presence of stocks of chemicals and dangerous goods. Further, the provision of ongoing training in safe chemicals use, handling and management, and to put in place effective occupational health and safety provisions to workers is a necessity.

Chapter 12

International Linkages

12.0 Introduction

This chapter identifies those chemicals management stakeholders in Guyana, both within and outside of Government, that have linkages with international organisations or that participate in international agreements concerned with the management of chemicals. Such linkages would offer possibilities for stakeholders to access technical assistance, information and potentially funding that would be of benefit to the Guyanese chemicals management infrastructure.

A number of organisations and agencies in Guyana have connections to Regional and International bodies which are concerned with various aspects of the sound management of chemicals. Although not all of the agencies have ongoing chemicals management initiatives, they may still be able to provide resources that would facilitate and inform the establishment of a national management programme.

In addition to Government Ministries, Departments, and Statutory Boards, there are a number of International and Regional Agencies that are considered as primary stakeholders in the chemicals industry in Guyana. They consist of International, Regional and National Organisations.

International Organisation	National Point	Focal	Other Ministries / Agencies Involved	Related National Activities
UNEP	Office of the President	of the	PTCCB, Climate Change Unit, EPA	Environmental Governance, Climate Change and Harmful Substances
WHO	Ministry of Health	of	Food and Drug Department, Guyana National Bureau of Standards	National Public Health
PAHO	Ministry of Health	of	Food and Drug Department, Guyana National Bureau of Standards	National Public Health
FAO	Ministry of Agriculture	of	PTCCB, Food and Drug Department, Guyana National Bureau of Standards	Food Production, Pest and Disease Management, Aquaculture, Food Standards

IICA	Ministry of Agriculture	of PTCCB, NARI	Food Production Pest and Disease Management
CARDI	Agriculture	PTCCB, NARI	Food Production Pest and Disease Management
ILO	Office of the President	the Ministry of Labour	Internationally recognized human and labour rights.
World Bank	Office of the President	Ministry of Finance	Financial Matters and Poverty Reduction
IDB	Office of the President	Ministry of Finance	Financial Matters and Poverty Reduction
CDB	Office of the President	Ministry of Finance	Financial Matters and Poverty Reduction
OECD	Ministry of Foreign Affairs	of Ministry of Finance	Economic, social and governance challenges
CARICOM	Office of the President	the Ministry of Foreign Affairs, Ministry of Trade	Regional Development and Trade
Basel Convention	EPA	Ministry of Trade	Trans boundary Movement of Hazardous Waste
Stockholm Convention	Office of the President, PTCCB	Ministry of Foreign Affairs, EPA	Persistent Organic Pollutants Management
Rotterdam Convention	Ministry of Foreign Affairs	of PTCCB	Prior Informed Consent for Hazardous Chemicals
CGPC	PTCCB		Pesticides

12.1 International and Regional Organisations

Guyana is home to the Offices of a number of Regional and International Agencies with some levels of involvement in chemicals management.

12.11 Food and Agricultural Organisation of the United Nations

The Food and Agricultural Organisation of the United Nations (FAO), as part of its mandate, oversees the broad management of pesticides and chemicals safety as this relates to agriculture and food production. Areas of involvement include chemicals inventories, policy analysis, and development of legislation, administration of International Conventions, and training and education.

12.12 Inter-American Institute for Cooperation in Agriculture

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialised Agency for agriculture of the Inter-American system. It is a development Agency

that promotes the sustainable development of agriculture, food security and the prosperity of rural communities in the Americas.

The Institute collaborates with the FAO and the Pan American Health Organisation (PAHO) in areas covering agricultural health and safety, including the safe handling and use of chemicals and toxic materials. Collaborations also exist at the national and Regional levels with the Ministry of Agriculture. Additionally, IICA conducts distance education courses in occupational health and safety and organic farming as part of the Agency's objective to promote safe and sustainable agricultural practices.

12.13 Pan American Health Organisation

The Pan American Health Organisation (PAHO) is a regional Office of the World Health Organisation. Their involvement in national and Regional efforts to manage chemicals relates primarily to the mitigation and reduction of human and environmental health impacts resulting from chemical production, use and disposal. PAHO provides technical assistance and advice on matters relating to environmental quality and environmental health, as well as developing and implementing training and capacity-building programmes in the country. PAHO is also a repository of useful information and guidance on issues related to sound chemicals management, and seeks to continuously facilitate the dissemination of this information to other stakeholders.

12.14 Inter American Development Bank

The Inter American Development Bank (IDB), which was established in 1959 to support the process of economic and social development in Latin America and the Caribbean, is the main source of multilateral financing in the Region. The IDB Group provides solutions to development challenges by partnering with governments, companies and civil society organizations, thus reaching its clients ranging from central governments to city authorities and business entities.

The local Office of the Inter American Development Bank (IDB) has an involvement with chemicals management in the agricultural sector and has provided funding for training of farmers in improved chemical management as well as in the establishment of a pesticides laboratory.

12.15 Caribbean Community

The Secretariat of the Caribbean Community (CARICOM), which is located in Guyana plays an important part in chemical management in the areas of agricultural

production. The Secretariat is currently the hub for developing a strategy for the implementation of the International Chemical Convention in the Region.

The Secretariat, in partnership with the United Nations Environmental Programme (UNEP), is responsible for the four year project designed to build capacity for CARIFORUM countries for the implementation of Multi-lateral Environmental Agreements (MEAs).

12.16 Caribbean Agricultural Research Development Institute

The Caribbean Agricultural Research Development Institute is the sole Regional research and development institution that is tasked with the responsibility for an effective technology and innovation system within the Region.

The CARDI Unit in Guyana coordinates the Caribbean Rice Development Network (CRIDNET) Regionally.

12.17 Partners of America

Partners of the Americas, a non profit voluntary organisation, work towards improving the life of communities across the Western Hemisphere by providing the necessary skills to fulfil their agricultural needs and protect the environment. In Guyana, they have implemented a “farmer to farmer” programme, funded by the United States Agency for International Development (USAID), that is targeting non traditional and speciality crops. Partners of the Americas also provide training to farmers and farm workers in pesticide and chemical management.

12.18 United States Agency for International Development

The United States Agency for International Development (USAID) is a United States of America (USA) Federal Agency that provides support for economic growth, agriculture and trade. This Agency has been active in the agriculture sector in Guyana. Its work includes the management of pesticides and chemicals used in agriculture and food production in Guyana.

12.2 International and regional agencies

Guyana is a party to following international chemical agreements:

- (a) **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (abbreviated as Hazardous Waste).** The objectives of this convention is to reduce transboundary movements of wastes subject to the Convention to a minimum consistent with the environmentally sound and efficient management of such wastes; to minimize the amount and toxicity of wastes generated and ensure their environmentally sound management as closely as possible to the source of generation; and to assist Least Developed Countries in environmentally sound management of the hazardous and other wastes they generate. The focal point for this convention is the Environmental Protection Agency.
- (b) **Montreal Protocol on Substances that Deplete the Ozone Layer (abbreviated as Ozone Layer Protection).** The objective of this protocol is to protect the ozone layer by controlling emissions of substances that deplete it. The focal point is the Hydrometeorological Department of the Ministry of Agriculture.
- (c) **Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL) (abbreviated as Ship Pollution)** which seeks to preserve the marine environment through the complete elimination of pollution by oil and other harmful substances and the minimization of accidental discharge of such substances. The focal point for this protocol is the Ministry of Foreign Affairs.
- (d) **United Nations Convention on the law of the Sea (LOS)** which aims to set up a comprehensive new legal regime for the sea and oceans; to include rules concerning environmental standards as well as enforcement provisions dealing with pollution of the marine environment. The focal point for this Convention is the Ministry of Foreign Affairs.
- (e) **Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade,** with the aim to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by

disseminating these decisions to Parties. The focal point for this procedure is the Pesticides and Toxic Chemicals Control Board.

- (f) **Stockholm Convention on Persistent Organic Pollutants (POPs)**, which is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife. The focal point for this Convention is the Pesticides and Toxic Chemicals Control Board.
- (g) **Strategic Approach for International Chemical Management (SAICM)**, which is a policy framework to promote chemical safety around the world. The focal point for this framework is the Pesticides and Toxic Chemicals Control Board. Guyana currently serves as the sub regional focal point for the Latin America and the Caribbean Regional Group (GRULAC).

Guyana is a member of the **Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC)**. The mission of the Group is to promote sustainable agriculture and to protect human health and the environment through effective management of pesticides and toxic chemicals in the Caribbean. Guyana became a member in 2001 with the Pesticides and Toxic Chemicals Control Board the representative body. Guyana currently serves as the Chair for the Group and performs the function of the Secretariat for the body.

FAO's **International Code of Conduct on the Distribution and Use of Pesticides** has been adopted for use by the Pesticides and Toxic Chemicals Control Board in Guyana.

12.3 Participation in Relevant Technical Assistance Project

Name of Project	Donor Agency	National Contact Point	Relevant Activities
Developing an Integrated National Programme for the Sound Management of Chemicals and SAICM Implementation in	QSP Trust Fund	Pesticides and Toxic Chemicals Control Board	Development of a National Chemicals Profile for Guyana and Prioritising SAICM Implementation

Guyana			
Agricultural Diversification Programme	IDB	Ministry of Agriculture	Laboratory Equipment for the Pesticides Laboratory
Hazardous Waste Management Plan	UNDP	Ministry of Foreign Affairs	Hazardous waste inventory and management plan
Developing a National Implementation Plan for the Stockholm Convention on POPs for Guyana	GEF	Pesticides and Toxic Chemicals Control Board	Implementation of the Stockholm Convention

12.31 Agricultural Export Diversification Programme

The Agricultural Export Diversification Program (ADP) aims to contribute to the increase of Guyana's export growth rate and reduce its volatility. Its purpose is to establish services and institutions for a sustainable increase in the income derived from the export of non-traditional agricultural exports in the aquaculture, fruits and vegetables, and livestock sub-sectors; enhancing the protection of domestic consumers from illness, and domestic production from disease and contamination. The executing agency is the Ministry of Agriculture with the cost of the Project is US \$ 21,919,000.00.

The ADP comprises four components: (i) promotion of Private Sector Entrepreneurship (PSE) in agribusiness that will foster initiatives to enhance entrepreneurship capabilities in the agribusiness cluster. It will also support the implementation of institutional arrangements for promoting and managing the agricultural diversification strategy; (ii) improving the capabilities of Agribusiness Export and Facilitation Services (AES), that will support agribusiness through delivering regulatory and public services, such as technology adaptation and transfer, and market information; (iii) strengthening and consolidating Agricultural Health and Food Safety Services (AHFSS) that will improve the effectiveness of the animal health, plant health and food safety systems; and (iv) Drainage and Irrigation Rehabilitation (DIR), to rehabilitate one primary and secondary D&I system that is suitable for agricultural diversification purposes.

The Program will finance (i) acquisition and deployment of equipment and supplies for the Pesticides Laboratory; (ii) training; and (iii) access to updated information through a peer international public institution regarding international regulations, proposals, country or regional blocks requirements.

It will: (i) promote the participation and fulfillment by the GOG of existing obligations and those that will be acquired with CARICOM/CSME related to regulations, diagnostic and control laboratories, and vigilance and surveillance systems; (ii) establish an integrated training system that will facilitate both inspection and advice to growers, processors, and packers in GAP, GMP and HACCP; (iii) consolidate the activities of the Inspection and Quarantine system at airport and frontier posts among the agencies; and (iv) reinforce the laboratory capacity of the FDD, the Veterinary Diagnostic Laboratory and the Plant Health Laboratory towards their accreditation by international agencies. New equipment and supplies will be acquired to modernize the laboratories supporting sanitary and food safety demand for analysis and diagnosis.

12.32 Development of a National Implementation Plan for Guyana

The objective of the Project is to build the capacity of the Co-operative Republic of Guyana to implement the Stockholm Convention through the development of its first National Implementation Plan. Ultimately, to protect human health and the environment by reducing and, wherever possible, eliminating releases of POPs and other hazardous chemicals. The Proposed cost of the Project is US \$ 410,000.00 and the executing agency is UNEP and the Pesticides and Toxic Chemicals Control Board.

Some of the key outputs of this Project are:

- (a) to compile inventories of POPs and other related hazardous chemicals and their management; assessment of relevant national legislation and gaps analysis;
- (b) assessments of national capacities for POPs management, monitoring, control and disposal;
- (c) Interagency and stakeholder coordinating mechanism established and operational; and
- (d) A draft NIP with costed action plans addressing priorities and meeting the provisions of the Convention.

12.33 Capacity Building for Management of Natural Resources and Environment

The core objective of the project is to build the capacity of partner organizations to assist them in the execution of their mandates in the thematic areas of sustainable use of biodiversity, and in pollution prevention and control. Public education, awareness and communication activities would also be developed to support these thematic areas. The Project was executed by the Ministry of Foreign Affairs and the UNDP at a cost of US \$ 957,500.00 funded under the UN Development Assistance Framework. One of the output under this Project was the development of an inventory and strategy for the improvement of hazardous waste management in Guyana. This led to the provision of the following: an inventory of hazardous wastes in the country; an awareness programme on hazardous waste management; national

strategy for hazardous waste management; and staff trained in implementation of the strategy.

12.34 Developing an Integrated National Programme for the Sound Management of Chemicals and SAICM Implementation in Guyana

This project seeks to formally establish an interagency committee as well as make an assessment of the chemical management situation in Guyana by developing a National Chemicals Management Profile. In addition, through the project, Guyana aims to identify existing gaps among government agencies, business and industry, and public interest and labour organizations, and to identify and present their respective priorities. The identification of such capacities, gaps, and priorities will lead to the development of action plans to address these issues leading to the development of a National SAICM Implementation Plan to implement SAICM in a systematic and timely manner. The assessment, as part of its conclusions, will also identify common priorities and opportunities for specific partnership projects involving government and other stakeholders towards meeting these required objectives. The cost of the Project is US \$ 118,500.00 and the executing agency is the Pesticides and Toxic Chemicals Control Board and UNITAR. The Project is funded under the SAICM QSP Trust Fund.

The project addresses the importance placed on National Profiles, identification of capacity needs for sound chemicals management and SAICM implementation, priority setting, and sound governance as fundamental components of many of the “work areas” listed in the Global Plan of Action, and acknowledges the “development or updating of national chemical profiles and the identification of capacity needs for sound chemicals management” as a strategic priority (a) of the Quick Start Programme. In addition, this project helps to establish the National Profile as a “living document” –revisited and updated at regular intervals, in order to maximise its effectiveness as an important tool for sound chemicals management.

The previous activities undertaken to assess the strengths and weaknesses of the national chemicals management will be the foundations for developing the National SAICM Implementation Plan of Guyana. This national document will include key action plans for SAICM implementation priorities and promoting integrated management of chemicals in general.

Through the project, Guyana will increase its understanding of, and strengthen, the foundations of sound chemicals management, which will greatly assist the country in the successful implementation of SAICM and chemicals-related international and regional agreements, such as the Stockholm and Rotterdam Conventions.

Expected outcomes of the project:

- (a) An interministerial coordination mechanism that raises awareness and strengthens information exchange among government ministries and stakeholders and manage the implementation of SAICM
- (b) A National Chemical Profile for Guyana
- (c) A National SAICM Capacity Assessment
- (d) Agreed priorities for SAICM implementation
- (e) Develop a national blue-print (i.e. a National SAICM Implementation Plan) for the implementation of SAICM.

12.4 Comments / Analysis

There are several relevant and potentially useful linkages between agencies in Guyana and international organisations, programmes and bodies concerned with chemicals management. Such linkages offer opportunities for Guyanese agencies to benefit from information sharing and exchange, technical advice, training and other forms of technical and financial assistance.

It must be noted however, that chemicals management is not necessarily defined as a priority in the programmes of international bodies operating in conjunction with Guyanese agencies; neither is it a priority for the local agencies receiving assistance. This can mean that international affiliations are not used to their full advantage to strengthen chemicals management programmes and activities in Guyana – in some instances local agencies have failed to take advantage of the opportunities made available by international organisations.

The national focal points for the various international organisations and agreements are scattered over a wide range of Departments and Ministries, while there are few inter-departmental/inter-ministerial mechanisms to co-ordinate activities initiated by the international bodies or agreements.

As a result, although a number of related projects may be on-going within the country; these projects may not be effectively integrated into a comprehensive national programme for chemicals management.

With respect to the implementation activities for various international agreements that the country is involved, Guyana is in the process of attaining compliance with these accords. Unfortunately, although it is recognized that significant benefits can arise from involvement in these multilateral agreements, the implementation activities for such may not be in keeping with the national strategic development goals.

Chapter 13

Resources Available and Needed for Chemicals Management

13.0 Introduction

This chapter provides an overview of resources available within government related to various aspects of chemicals management and to analyze resource needs

13.1 Resources Available in Government Ministries / Institutions

There is a variety of expertise existing within governmental institutions in Guyana. Some of this expertise was acquired through formal education at the tertiary level, some through professional development activities such as workshops and conferences, and some through on-the-job training and experience.

Ministry / Agency Concerned	Number of Professional Staff	Types of Expertise Available	Financial Resources Available
Ministry of Agriculture		Entomology Agronomy Policy Development Education and Awareness Raising	
PTCCB	5	Policy Development Agronomy Environmental Toxicology Use and Application of Pesticides Risk Analysis and Assessment Weed Science Entomology Education and Awareness Raising Chemical Handling and Safety Occupational Safety and Health Chemical Analysis	45 M
Vector Control Unit (Ministry of Health)		Environmental Health Management	
Ministry of Labour		Chemicals Handling and Safety Occupational Safety and Health	

Food and Drug Department	Analytical Chemistry Chemical Analysis Food Science
Environment Protection Agency	Environmental Chemistry Environmental Science Occupational Safety and Health Risk Analysis

13.2 Resources Needed by Government Institutions to Fulfil Responsibilities Related to Chemical Management

Although there is some chemicals management expertise present within government institutions, there is still a need for this capacity to be built and strengthened. This strengthening would include increasing overall staff complements by hiring persons with chemicals management expertise, as well as upgrading the skills of existing staff, thus enabling them to better execute tasks related to the management of chemicals and hazardous substances.

It must be noted that whilst some form of chemical expertise is available with some institutions; their occupational responsibilities are not necessarily in the management of chemicals and will indirectly be unavailable.

In this regard, with the exception of the personnel within the Pesticides and Toxic Chemicals Control Board, the number of staff and experts present at each institution is basically dependent on the related Ministry and budget available. Environmental scientists, physicians, toxicologists, pharmacists, public health officers, nurses, chemists, food scientists, policy analysts and many other related disciplines are required for chemical management. In this regard, specific trainings in the fields of chemical safety, poisoning prevention & treatment, environmental management, toxicology, epidemiology, risk analysis, logistics, conventions & international agreements, socioeconomic & policy analysis and other related topics are needed to enhance the capability and capacity of the existing human resources.

13.3 Resources Available in Non-governmental Institutions for Chemicals and Related Waste Management

The contribution or availability of resources by non governmental institutions in Guyana is nonexistent. There are no public interest organisation or consumer groups with any interest in chemicals management at this time, however, with the increase

activities within the environmental, agriculture and industrial sector, some groups will develop in the near future.

13.4 Comments / Analysis

There are two primary deficiencies to be highlighted in discussing the availability of chemicals management resources in government agencies and statutory bodies.

The first of these is the lack of expertise specifically focused on the sound management of chemicals. Although a number of Ministries, Departments and other bodies have professional staff with some level of qualification in the area of chemicals management, there has been a clearly expressed need for more comprehensive training to enable the existing personnel to better carry out their duties, particularly in regulatory and emergency response situations and organisations.

Further, it is rarely the case that an organisation will have staff working exclusively in areas related to chemicals management, and few organisations have training programmes in place to develop their chemicals management capacity. It is also of importance to note that in agencies that are involved with the operational (rather than regulatory) aspect of chemicals management, there is a clear need for workers to receive training in safe chemicals use, handling, storage and disposal, including spill/accident response procedures and the use of personal protective equipment.

The second deficiency in capacity relates to the overall shortage of staff available to carry out organisations' chemicals management mandates. This understaffing, and the fact that individuals often have several other duties in addition to their chemicals management responsibilities, is a significant constraint on the effective functioning of the national chemicals management infrastructure.

It is not immediately clear what would be the best strategy to mobilize sufficient technical and human resources to ensure the sound management of chemicals in Guyana. However, regardless of which strategy is developed, one thing is certain; input from all stakeholders will be needed to ensure that the strategy is sustainable.

International watch dog groups in the chemicals sector needs to be lobbied to the needs of developing countries for the establishment of similar agencies within countries so as to improve the over management of chemicals throughout its life cycle. Whilst Governments input is commendable, the private sector and NGOs need to mobilise resources to assist the Government to better manage this sector. The Georgetown Chambers of Commerce and the Guyana Manufacturers Association

along with the Guyana Consumers Association need to take the lead in mobilising resources for the improvement in this sector through the establishment of public private partnerships.

CHAPTER 14

CONCLUSIONS AND RECOMMENDATIONS

14.1 Conclusions

The legislative infrastructure for ensuring sound management of chemicals in Guyana appears overall to be largely adequate. While the legislative infrastructure is adequate, a number of areas need attention, particularly: the more effective implementation of laws, including improved inspection, identification of overlaps or gaps, and how to make non-regulatory instruments more effective. Implementation could be improved through sound management procedures, including:

- a) Chemicals registration schemes (apart from pesticides where it is effective);
- b) Storage of chemicals;
- c) Transport of chemicals;
- d) Handling of containers and incompatibilities among and between chemicals in each of these areas;
- e) Management of obsolete and expired chemicals, confiscated and impounded chemicals; and
- f) Improved transport of hazardous chemicals.

Awareness concerning chemical safety matters remains weak both among the public in general and many decision makers; but there exist educational and training programmes related to chemicals management. Civil society, in cooperation with government and the private sector, including the communications media, have a crucial role to play in improving public awareness and educating various users of chemicals in the society

On the whole the technical infrastructure exists in Guyana for sound management of chemicals. Nevertheless a number of areas has been identified which need strengthening, particularly laboratory accreditation, availability of reference materials, capacity for recycling and safe disposal of obsolete chemicals, safe storage, handling and transport of chemicals and emergency response capabilities outside urban areas.

Among the areas of concern and issues relating to sound management of chemicals in Guyana identified in this first version of the National Profile attention is called to those listed below. While in principle access to international databases is sufficient, as everything is available in the public domain on internet, the availability of

national data is variable and analysis of the data and its harmonisation need improvement. In relation to data collection, particularly:

- a) There is a need for harmonised definitions
- b) While a beginning has been made, overall data on consumer chemicals need strengthening.
- c) There is the need for tracking of certain key chemicals such as mercury.

In the health related aspect of chemicals, there is a general lack of data, either in relation to public health or the workplace. Exposure data is almost none existent and is not well understood and needs attention for all categories of chemicals. The use of available data for local risk assessment and other related activities has limitations and needs to be fortified.

A Poisons Information Centre is needed to cover the country, with systematic collection of harmonised data on toxic exposures and other health related information including information on treating chemical related exposures.

14.2 Recommendations

The following recommendations are made to improve the management of chemicals in Guyana.

1. In order to promote sound management of chemicals throughout Guyana and oversee the implementations of these recommendations, as may be appropriate, taking into consideration existing inter-ministerial coordinating activities, **a mechanism for coordination and cooperation should be established within a legal entity, including terms of reference and an assigned secretariat.** Appropriate levels of government and concerned non-governmental organisation should be represented and procedures for broad consultation among stakeholders encouraged.
2. In order to ensure a regularly updated situation analysis for sound management of chemicals in Guyana, **the National Profile should be established on an going programme bases under the auspices of the PTCCB,** expanding to all chemical sectors and covering the whole chemicals life cycle, including raw materials, and adding other areas of infrastructure (particularly waste handling and recycling, chemical emergency response, ports handling, transportation and storage.
3. In order to encourage the development of an improved information base for decision making about sound management of chemicals in all sectors and by all relevant stakeholders, **the data collection process should be institutionalised,**

broadening it to cover all sectors of chemicals production and use, including raw materials, and establishing harmonised data collection formats with standardized terminology and mechanisms for improved data reliability. This calls for an appropriate Institution to host and finance the data collection.

4. In order to provide a **tool for information exchange and consultation concerning the National Profile**, and to promote the availability of information on chemicals and chemicals related issues in Guyana, **a website should be maintained** with this information.

5. In order to promote an improved understanding of chemical safety matters, all sectors of society should be encouraged to cooperate in developing further public and worker awareness and professional training activities for sound management of chemicals. In this regard, the **Government should encourage the role of NGOs, workers and public by raising their awareness and knowledge regarding chemicals management and safety culture**. This can be achieved through training, education, publication, information dissemination, responsible care program and any other means.

6. In order to strengthen chemical safety information network and poison centers network, there is need to **enhance the monitoring capacity on the entire life cycle of chemicals and strengthening current health and environmental surveillance systems** by taking connection capability at all levels into account.

7. In order to reduce the risk associated with chemical accident, there is need to **develop chemical accident management and emergency response strategy** and carry out inventory on technical and material resource and describe capacity needs.

8. In order to improve waste management there is need for the **development of a hazardous waste management programme or strategy** and harmonized national waste management plan.

9. In order to ensure that timely action is taken to implement these recommendations and that the relevant institutions incorporate the necessary budget appropriations in the forthcoming financial budget periods, it is proposed that a **meeting be convene for an early consultation of all interested stakeholders to draw up work plans and timetables and assign responsibilities for each proposed action**.

10. In order to increase the number of technical personnel and improve the management of chemicals by having personnel trained specifically in this area, **scientific and specialised courses in the University of Guyana should be introduced** on the sound management of chemicals and hazardous materials.

11. In order to improve the management of pesticide poisoning, **a poison information centre should be established.**

12. In order to improve and enhance the level of awareness of the hazards consequent upon the handling of chemical materials towards the various community classes, **formulate plans, awareness and instruction programmes with the involvement of the private sector** and provide the material support for the development with emphasis on the role of the media in the implementation of such programmes.

13. In order to improve private sector role in the management of chemicals, **enhance and encourage the policy of dialogue and cooperation between the government, non governmental organisation and the private sector** in the decision making process.

14. In order to make the experience of Guyana in developing its National Chemical Profile widely available internationally, it is proposed that Guyana **make the approved Profile available to UNITAR** for inclusion on the National Profile Website.

Appendix I

Names and Addresses of Key Individuals and Organisations

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Permanent Secretary
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Mr. Balraj Balram
Permanent Secretary
Ministry of Public Works & Communication
Fort Street, Kingston
Georgetown

Mr. Robert James
Deputy Head
Department of Custom & Trade Administration
Main Street
Georgetown

Mr. Alvin Parag
Representative Pesticides Importer
Associated Industries Ltd.
Ruimveldt, Georgetown

Mr. Chandradat Chintamani
President

Mr. Sewchand
Permanent Secretary
Ministry of Local Government
Fort Street, Kingston
Georgetown

Mr. Trevor Thomas
Permanent Secretary
Ministry of Labour, Human Services & Social
Security
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Mr. Neermal Rekha
Finance Secretary
Ministry of Finance
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