

## Foreword

The protection of Barbados' environment is critical to the sustainability of our way of life as well as our further social and economic development.

As Barbados' boundaries open up, increased trade, more rapid physical and infrastructural development, heightened economic activity and larger numbers of visitors will require us to better manage our natural resources and implement measures to mitigate adverse impacts on the environment. In this regard our consciousness of the presence of persistent organic pollutants and their management, in order to reduce the risks they pose to Barbados' environment, is part of the mandate of the Ministry of Housing, Lands and the Environment.

The Ministry recognises that the successful management of POPs requires collaborative effort between the public and private sectors, the regulated and the regulator. Initiatives to strengthen our approach and guarantee success must be actively and continually pursued. At the level of government, a cross sectoral approach, the collation and dissemination of the relevant data, inventory maintenance and control, as well as information sharing are central to our management effort.

I commend this document to you and urge all citizens corporeal or corporate to join the Ministry in our efforts. This is a task that requires us all to be engaged.



A handwritten signature in black ink, appearing to read 'H. Elizabeth Thompson'.

H. ELIZABETH THOMPSON  
Minister

## Introduction

In 2001, Barbados was chosen by the United Nations Environment Programme (UNEP) to be one of twelve countries worldwide to participate in a global pilot project for the development of National Implementation Plans (NIPs) for the Stockholm Convention on Persistent Organic Pollutants (POPs). This project was initiated by UNEP Chemicals, and the Barbados sub-project was funded by the Global Environment Facility, with co-financing provided by the Government of Germany.

This National Profile of Chemicals Management has been prepared as a key component of the process of developing an effective Implementation Plan, but its scope extends beyond the management of POPs and the requirements of the Stockholm Convention, to address national chemicals management in a wider sense. Chapter 19 of the Agenda 21 programme of action, passed by more than 170 countries at the 1992 United Nations Conference on Environment and Development, established the international goal of environmentally sound management of toxic chemicals. It is hoped that this Profile will facilitate greater understanding of the functioning, strengths and weaknesses of the Barbadian chemicals management framework, and that it will act as a complement to other national activities aimed at the achievement of the principles outlined in Agenda 21.

The guidance document *Preparing a National Profile to Assess the National Infrastructure for Management of Chemicals* and the companion guidance note on *Preparing/Updating a National Profile as Part of a Stockholm Convention National Implementation Plan*, both prepared by the United Nations Institute for Training and Research (UNITAR), were invaluable aids in the completion of the Profile. Thanks must be extended to Dr. Hans de Kruijf of UNITAR for his expert training, advice and encouragement in the initial stages of Profile preparation. The preparation process was at every stage informed by the recommendations and principles outlined in the UNITAR guidance.

The first of these principles states that:

*“a National Profile should be prepared at the country level through a process which involves all concerned ministries and other government institutions, as well as other interested national parties (‘by countries for countries’)”.*

To this end, a National Task Team for the Preparation of a National Profile was established. This team was responsible for all the data collection, compilation, analysis and discussion involved in the preparation of this document, and comprised the following agencies and persons:

- Environmental Protection Department, Ministry of Housing, Lands and the Environment – Ms. Thérèse Yarde (Chair)
- Environment Unit, Ministry of Housing, Lands and the Environment – Mr. Rickardo Ward
- Ministry of Agriculture and Rural Development – Mr. Ralph Farnum and Mr. Michael James
- Ministry of Health – Mr. Emerson Yearwood and Mr. Lester Cumberbatch
- Government Analytical Services – Ms. Beverley Wood and Mr. Jefferson Dyll
- Barbados Statistical Service – Mr. Pedro Hutchinson
- National Council for Science and Technology – Mr. Lennox Chandler

- Caribbean Conservation Association – Dr. Joth Singh and Mr. Kemraj Parsram
- Barbados Agricultural Society – Mr. James Paul

The Task Team was ably assisted in its duties by project volunteer Ms. Stacia Grazette.

The objective of stakeholder involvement was further achieved by means of a National Consultation on Chemicals Management. This event, held on June 17, 2003, was attended by all members of the National Profile Task Team, who served as facilitators, and by representatives from 27 stakeholder groups, including government ministries and departments, international agencies, non-governmental organisations, labour unions and the industrial, commercial and tourism sectors. The active involvement and participation of these concerned parties were instrumental to the completion of this National Profile document.

The final principle espoused in the UNITAR guidance is that the National Profile should be a “living” document, constantly improved and updated to reflect the changing state of national chemicals management. It is therefore the hope of the Task Team that this document will not be seen as a conclusive assessment of the Barbadian chemicals management framework, but that it will be continually revisited and revised, in order that it may remain a relevant, useful, and authoritative source of information. With this in mind, corrections and additions to the Profile will be appreciatively received.

Sincere thanks are extended to all who supported and participated in the production of this document.

# Executive Summary

This National Profile on Chemicals Management provides an assessment of the framework for chemicals management in Barbados, and includes information about the legal, institutional, administrative and technical aspects of chemicals management.

## Chapter 1: National Background Information

Chapter 1 provides a brief summary of the physical, demographic and political conditions of Barbados. It also contains information about the sizes and structures of the country's agricultural and industrial sectors.

Barbados, the most easterly island in the Caribbean, has a land area of approximately 431 km<sup>2</sup> and a population of approximately 270,000 persons. The industrial and agricultural sectors contribute 6.1% and 4.7% respectively to the total Gross Domestic Product. The major products of the industrial/manufacturing sector are electronic components, while sugar cane is the major product of the agricultural sector. The majority of industrial and agricultural facilities are small operations, employing less than 16 persons full-time.

## Chapter 2: Chemical Production, Import, Export and Use

Chapter 2 contains information on the import and export of chemicals to and from Barbados. Information about chemical production and reformulation is not included, as the privacy requirements of the Statistics Act Cap. 192 of Barbados law prevent this data from being published. No quantitative data on national chemical use was able to be found.

Data from the year 2001 reveals that in that year 2,067,067 kg of pesticides were imported into Barbados. Total exports of pesticides amounted to 2,649,446 kg, with 2,435,288 of that being domestic exports and 214,158 being re-exports.

The five leading sources of imports were the United States, the United Kingdom, Dominica, Trinidad and Tobago and Venezuela. The five leading recipients of exports were Trinidad and Tobago, Jamaica, St. Lucia, Antigua and the Bahamas.

7,447,077 kg of fertilisers were imported into Barbados in 2001. The main sources of imports were the United States, the Dominican Republic, Trinidad and Tobago, Suriname and Germany. 20,347 kg of fertilisers were exported, to Suriname, St. Lucia and Grenada.

In 2001, 380,526,328 kg of petroleum products were imported into Barbados, the main sources of imports being Trinidad and Tobago, Suriname, Jamaica and Puerto Rico. 50,936,536 kg of petroleum products were exported from the island, primarily to Trinidad and Tobago, Suriname, Guyana and St. Vincent and the Grenadines.

Imports of consumer chemicals in 2001 amounted to 3,581,135 kg, while exports totalled 82,415 kg.

In 2001, 9 tonnes and 15,279 litres of solid and liquid hazardous waste were exported from Barbados for disposal under the Basel Convention. In 2003, 12,420 kg and 11,220 litres were exported. There is a lack of information about rates of hazardous waste generation in Barbados; it may be reasonably assumed that the quantities presented in this report represent only a fraction of the total amount of chemical and hazardous waste generated.

## Chapter 3: Priority Concerns Related to Chemical Production, Import, Export and Use

Chapter 3 presents an overview of the nature and priority of environmental and health concerns associated with chemicals production, trade, use and disposal in Barbados. The

problem areas and concerns highlighted in this chapter were identified using existing reports and data, as well as the input of stakeholders who participated in a national consultation on chemicals management.

The environmental and health concerns identified relate to groundwater contamination, coastal and marine pollution, impacts on biodiversity, air contamination, hazardous waste management, management of obsolete chemicals, soil contamination, occupational health and chemical residues in food. Of these, groundwater contamination, coastal and marine pollution, biodiversity reduction, management of hazardous wastes and obsolete chemicals and occupational health have been ranked as high priority issues.

In several cases there is a lack of data about the magnitude and severity of the problems identified; this data deficiency and the absence of coordinated programmes to gather the necessary information are themselves causes for concern.

#### **Chapter 4: Legal Instruments and Non-Regulatory Mechanisms for Managing Chemicals**

Chapter 4 provides an overview of the existing legal and non-regulatory mechanisms governing chemicals management in Barbados.

The key pieces of legislation in this regard are the Pesticides Control Act, 1974, and the Health Services (Control of Drugs) Regulations, 1970. A number of other laws and regulations with bearing on chemicals management exist, although the enforcement status of these instruments varies widely.

The Pesticides Control Act provides for “the control of the importation, sale, storage and use of pesticides” and empowers the Minister to make regulations in all areas of pesticides management. Regulations developed under the Act are the Pesticides Control Regulations, which regulate the manufacture, import, storage, use, distribution and sale of approved pesticides, and

the Labelling of Pesticides Regulations, which regulate the labelling of pesticides that are distributed, exposed or offered for sale.

The Health Services (Control of Drugs) Regulations define the mechanism by which drugs used in the health services may be imported into, manufactured and distributed in Barbados.

There is little regulation of industrial chemicals, consumer chemicals and chemicals wastes, and there are no formal non-regulatory processes for the control of chemicals management in Barbados.

#### **Chapter 5: Ministries and Government Agencies Managing Chemicals**

Chapter 5 lists those governmental ministries, and their subsidiary agencies, that play a role in the management of chemicals in Barbados.

Ministries that exercise functions related to chemicals management are the Ministry of Housing, Lands & the Environment (through the Environmental Protection Department), the Ministry of Health, the Ministry of Agriculture and Rural Development, the Ministry of Labour, the Ministry of Commerce (through the Barbados National Standards Institution), the Ministry of Home Affairs (through the Central Emergency Relief Organisation, the Barbados Fire Service, and the National Council on Substance Abuse), the Ministry of International Transport (through the Barbados Port Inc.), the Ministry of Energy and Public Utilities and the Ministry of Finance (through the Customs and Excise Department).

#### **Chapter 6: Relevant Activities of Industry, Public Industry Groups and the Research Sector**

Chapter 6 identifies non-governmental stakeholders in chemicals management, outlines the roles these stakeholders play in the chemicals management process, and summarises the

experience and expertise housed within each organisation.

Stakeholder organisations listed in Chapter 6 come from a variety of sectors, including industry, manufacturing and distributing, non-governmental organisations, regional and international organisations, the research sector and labour unions. Areas of expertise include data collection, training and education, monitoring, and provision of information to workers. Areas where there appear to be a deficit of expertise and experience include enforcement and risk reduction.

### **Chapter 7: Inter-Ministerial Commissions and Coordinating Mechanisms**

This chapter describes existing collaborative mechanisms for national chemicals management. Chief among these are multi-stakeholder authorities and committees, such as the Pesticides Control Board, the Chemical Substances Technical Working Group, the National Ozone Committee, the Risk Analysis Monitoring Committee on Industrial Development and the National Advisory Committee on Occupational Safety and Health, which involve participants from both the public and private sectors. Chapter 7 provides an overview of the mandate and functioning of these committees.

### **Chapter 8: Data Access and Use**

Chapter 8 provides an overview of the availability of data to inform and facilitate effective chemicals management in Barbados.

Key agencies housing such data include the Ministry of Housing, Lands and the Environment, the Pesticides Control Board, the Labour Department, the Barbados Statistical Service and the Customs and Excise Department. The lack of coordinated and centralised data collection hampers ready access to and use of this data, as does the absence of standardised formats for its collection, compilation and storage.

The Pan American Health Organisation and the Food and Agriculture Organisation are two of the leading sources of international chemicals management related literature.

There is a pressing need for the national information exchange system to be strengthened to facilitate the flow of information between local agencies, and from international organisations to local government departments and other stakeholder groups.

### **Chapter 9: Technical Infrastructure**

Chapter 9 provides an overview of the technical infrastructure in Barbados that could be made available to support a comprehensive chemicals management programme.

There are three laboratories capable of providing the chemical analyses required to support effective chemicals management. These are the laboratories of the Government Analytical Services, the Forensic Sciences Centre and the Department of Biological and Chemical Sciences of the University of the West Indies. These labs possess a wide range of equipment that could be utilised in national chemicals management. This equipment includes both specialised equipment for data analysis and general hardware for the storage, analysis, retrieval and sharing of data.

There are a number of offices that house computerised information systems that could be used in the development and implementation of a national chemicals management programme. However there is currently no programme in place for harmonisation or connectivity between these offices, and the compatibility of these various systems is unknown.

The development of a coordinated and effective approach to chemicals management in Barbados will require significant strengthening of the existing technical infrastructure, particularly as it relates to equipment, staffing and technical training and education.

### **Chapter 10: International Linkages**

Chapter 10 identifies linkages between Barbados and international organisations with some interest in sound chemicals management. These organisations include the United Nations Environment Programme, the World Health Organisation, the Food and Agriculture Organisation of the United Nations, the International Labour Organisation, the International Programme on Chemical Safety and the International Organisation for Standardisation, among others. There are regional offices of the World Health Organisation and the Food and Agriculture Organisation in Barbados; connections with other international organisations have been formed via the relevant Government ministries and other local institutions.

Barbados is a participant in a number of international agreements related to chemicals management. These include the Basel, Rotterdam and Stockholm Conventions. The Environmental Protection Department is the primary responsible agency for the Basel and Stockholm Conventions, and shares responsibility for the Rotterdam Convention with the Ministry of Agriculture and Rural Development. The Environment Unit, Labour Department, International Transport Division and Barbados Port Inc. also each have some responsibility for one or more international agreements with relevance to chemicals management.

### **Chapter 11: Awareness/Understanding of Workers and the Public**

Chapter 11 reviews worker and public awareness of and sensitivity to chemicals management issues.

The main legal instruments specifically requiring the dissemination of information regarding chemicals management to the public are the Pesticides Control Act and its accompanying

regulations, which govern the labelling of pesticides and the provision of safety information to persons working with pesticides. The Act also imposes a duty of care on employers, workers and others involved in the management of pesticides.

There are few national programmes aimed at raising awareness and increasing understanding among workers and the public of environmental and health issues related to the use, disposal and management of chemicals, although there are some organisations that attempt to highlight these issues on an ad-hoc basis. There is a dire need to improve public awareness and understanding of chemicals management issues, and initiatives to achieve this end would be enhanced by the development and strengthening of partnerships between Government, the private sector and non-governmental organisations.

### **Chapter 12: Resources Available and Needed for Chemicals Management**

Chapter 12 provides an overview of the human resources existing within governmental institutions involved in chemicals management, and highlights the need for capacity building within these institutions.

While there is a range of expertise within the public sector in the area of chemicals management, it is rare that a ministry or department will have professional staff working exclusively in areas related to chemicals management or that budgetary provision will be made specifically for chemicals management activities. Most agencies have indicated that there is a need for additional staff to enable their chemical management mandates to be effectively carried out. There is also a need for chemicals management training for existing staff, particularly in the areas of safe handling and use, monitoring, analysis, emergency response, risk management and enforcement.

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# 1 National Background Information

This chapter provides a summary of general background information on Barbados, its physical and demographic context, political structure and the size and nature of its industrial and agricultural sectors.

## 1.1 Physical and Demographic Context

Barbados is the most easterly island in the Caribbean, with a land area of approximately 166 square miles (431 square kilometers). It maintains a parliamentary democracy, and is an independent sovereign state within the Commonwealth. English is the official language. However, a local English dialect exists.

As at the last Population and Housing Census in May 2000, there were 268,792 persons (Table 1.A) resident on the island. At the end of 2001, the resident population has been estimated at 270,400 persons. There is no official definition of urban or rural, hence it is not possible to provide a breakdown of the population into these categories. The average age of the population is approximately 36 years.

**Table 1.A: Estimated Resident Population as at May 2000**

	Both Sexes	Males	Females
<b>Estimated Resident Population</b>	268,792	129,241	139,554
<b>Tabulable Population</b>	250,010	119,926	130,087
<b>Institutional Population (not included above)</b>	2,610	1,542	1,071
<b>Estimated Undercount</b>	16,172	7,773	8,402

Source: Barbados 2000 Population and Housing Census

Of the tabulable population, 93.0% is black, 3.2% is white and 3.8% is categorised as being of "other" ethnicity.

As at the year 2000, the population of working age, i.e. (15 – 64), was found to number 178,365 (Table 1.B).

**Table 1.B: Population of Working Age**

Age Group	Both Sexes	Males	Females
15 to 19 years	20,263	10,220	10,043
20 to 24 years	19,199	9,666	9,533
25 to 29 years	21,289	10,618	10,671
30 to 34 years	21,061	10,355	10,706
35 to 39 years	22,821	11,005	11,816
40 to 44 years	21,472	10,290	11,182
45 to 49 years	17,934	8,598	9,336
50 to 54 years	14,551	7,024	7,527
55 to 59 years	10,202	4,677	5,525
60 to 64 years	9,573	4,270	5,303
<b>Total</b>	<b>178,365</b>	<b>86,723</b>	<b>91,642</b>

Source: Barbados 2000 Population and Housing Census

As at the end of 2001, the birth rate was 15.0 births/1,000 persons. Life expectancy at the end of 2000 was, on average, 77 years. The literacy rate has been estimated at 97.4% overall, with the estimate for males being 98% and for females 96.8%. Education is free at the primary and secondary levels, and is mandatory for children at these levels. Hence, the average level of education of the population is secondary, as not all children will undertake tertiary education. (See Table 1.C.)

**Table 1.C: Highest Level of Education Attained by Persons 15 Years and Over**

Sex	Total	Nursery/ Infant	Primary	Composite/ Senior	Secondary	University	Other Tertiary	Other Institution	None	Not Stated
<b>Both Sexes</b>	183,033	24	33,636	17,444	90,141	12,487	22,864	2,177	429	3,831
<b>Male</b>	86,585	10	14,605	8,394	44,280	6,090	9,969	921	219	2,097
<b>Female</b>	96,448	14	19,031	9,050	45,861	6,397	12,895	1,256	210	1,734

Source: Barbados 2000 Population and Housing Census

The unemployment rate at the end of 2001 was 9.9%. The percentage of women employed outside the home in 2001 was 43.8%.

## 1.2 Political/Geographic Structure

Barbados is divided into eleven (11) parishes. There are no divisions into regions or states.

The country adopts a parliamentary democracy, with the Head of State being Queen Elizabeth II, represented by a Governor General. The country has as its Head of Government a Prime Minister and a Cabinet is appointed by the Governor General on the advice of the Prime Minister.

A bicameral system of Parliament exists in the country, consisting of the Senate and the House of Assembly. Members of the Senate are appointed by the Governor General, while members of the House of Assembly are elected by direct popular vote to serve five-year terms. Nationals are eligible to vote from eighteen (18) years of age. There is no system of local government.

## 1.3 Industrial and Agricultural Sectors

Tables 1.D to 1.F summarise general information about the relative importance and structure of the industrial and agricultural sectors in Barbados, using data obtained for the year 2001.

**Table 1.D: Overview of the Industrial and Agricultural Sectors**

Sector	Contribution to the Gross Domestic Product (%)	Number of Employees	Major Products in each Sector
<b>Industrial/ Manufacturing Sector<sup>1</sup></b>	6.1%	9,449	Electronic Components
<b>Mining and Extraction</b>	0.7%	175	Crude Oil, Natural Gas
<b>Agricultural Sector</b>	4.7%	3,359	Sugar Cane
<b>TOTAL</b>	<b>11.4%</b>	<b>12,982</b>	

<sup>1</sup> Includes all manufacturing, production, formulation, assembly and related facilities

**Table 1.E: Structure of the Industrial and Agricultural Sectors**

Sector	Micro Farms/ Facilities <sup>1</sup>		Small Farms/ Facilities <sup>2</sup>		Medium Farms/ Facilities <sup>3</sup>		Big Farms/ Facilities <sup>4</sup>	
	No.	%	No.	%	No.	%	No.	%
<b>Industrial/ Manufacturing Sector</b>	332	72.3	107	23.3	18	3.9	2	0.5
<b>Agricultural Sector</b>	223	83.5	42	15.7	0	0	2	0.8

<sup>1</sup> 1 to 15 employees

<sup>2</sup> 16 to 100 employees

<sup>3</sup> 101 to 250 employees

<sup>4</sup> More than 251 employees

**Table 1.F: Breakdown of Agricultural Production**

Major Crops	Total Value of Crop (Bds \$M) <sup>1</sup>	Total Number of Employees	Size of Productive Areas (000s of hectares)
Sugar Cane	47.2	n/a <sup>2</sup>	8.3
Vegetables & Root Crops	50.5	n/a	1.7
Fishing	11.9	n/a	
<b>TOTAL</b>	<b>109.6</b>	<b>3,359.0</b>	<b>10</b>

<sup>1</sup> Bds\$1 is approximately equal to US\$0.51

<sup>2</sup> n/a: Information not available

## 14 Industrial Employment by Major Economic Sectors

Table 1.G identifies the size of industries that may have implications for the safe management of chemicals.

Table 1.G: Industrial Employment by Major Economic Sector

ISIC Code <sup>1</sup>	Description	Number of Facilities	Total Employment	Output Value (per year)	Major Emissions (type)
31	Food Industry	135	2,886	n/a <sup>2</sup>	n/a
32	Textiles/Clothing and Leather Goods	57	908	n/a	n/a
33	Wood and Wood Products, Printing	57	713	n/a	n/a
34	Paper and Paper Products	70	1,452	n/a	n/a
35	Chemical/Coal/Petroleum/Plastic Products	37	696	n/a	n/a
36	Non-Metallic Mineral Products	29	831	n/a	n/a
37	Basic Metals Industry	14	137	n/a	n/a
38	Fabrication of Machinery and Equipment	43	1,677	n/a	n/a
39	Other Manufacturing Industries	17	149	n/a	n/a
	Mining and Extraction (Coal/Oil/Natural Gas/Minerals/Metals)	8	175	n/a	n/a
	Electric Generation	1	482	n/a	n/a
	Dry Cleaning	7	235	n/a	n/a
	<b>TOTAL</b>	<b>475</b>	<b>10,340</b>	<b>n/a</b>	<b>n/a</b>

<sup>1</sup>ISIC: International Standard Industrial Classification of all Economic Activities, OECD

<sup>2</sup>n/a: Information not available



## 2 Chemical Production, Import, Export and Use

This chapter provides basic information on the production, import and export of chemicals in Barbados.

### 2.1 Chemical Production, Import and Export

In 1999, the Environment Unit, then of the Ministry of Environment, Energy and Natural Resources (now of the Ministry of Housing, Lands and the Environment) prepared a report on the results of the Hazardous Chemicals/Substances Survey and Inventory 1995-1998. The information presented in the inventory was gathered by means of surveys delivered to relevant companies operating in Barbados. In total ninety-one (91) companies responded to the survey over the four-year reporting period. The import statistics derived from the survey are summarised in Table 2.A below.

**Table 2.A: Hazardous Chemicals/Substances Imports 1995 – 1998**

	Weight (kg)	Volume (litres)
<b>1995</b>	456,862.35	3,433,837.87
<b>1996</b>	586,261.86	372,410.91
<b>1997</b>	800,170.74	496,329.05
<b>1998</b>	2,555,096.99	18,931,251.88
<b>TOTAL</b>	<b>4,398,391.94</b>	<b>23,233,829.71</b>

Source: Hazardous Chemicals/Substances Survey and Inventory 1995 - 1998

Over the four years of the inventory, 33.1% of the chemical substances reported were imported for use in the manufacturing sector, 23.3% for resale, 18.9% for use in the agricultural sector, 12.6% for use in cleaning, and 12.1% for use in other sectors.

It should be noted that these numbers are estimates derived from voluntary submission by a sample of 91 companies surveyed. It is uncertain how representative this sample is, and results are further affected by the fact that the number of survey results submitted varied from year to year.

Further information on chemical import and export is presented in Tables 2.B to 2.E below, which show the quantities and values of pesticides, fertilisers, petroleum products and consumer chemicals imported to and exported from Barbados. Due to the privacy clauses by which the Barbados Statistical Service is governed, which state that under the Statistics Act Cap. 192 of Barbados Law no information may be released in a form that allows for the identification of any individual or business, the statistics for production and formulation cannot be shown.

Barbados values its imports on a cost, insurance and freight (cif) basis; exports are valued on a free on board (fob) valuation. The cif value is made up of the cost of the goods at the port in the country of origin along with the value of insurance and shipping charges incurred in the transport of these goods to the country of the importer. The fob-value only takes into account the cost of the goods at the port in the country of the exporter. Valuation is consistent with World Trade Organisation (WTO) agreement on valuation, and weights are determined on a net weight basis.

In tables 2.C to 2.E the figures in the columns headed net imports represent total imports adjusted for re-exports. Re-exports are defined as goods imported and subsequently exported without having been altered. Domestic exports comprise those goods produced locally or altered locally after having been previously imported.

### **2.1.1 Pesticides**

Table 2.B shows the net mass and value of pesticides imports to and exports from Barbados, based on data from the year 2001. The five leading sources of pesticides imports to Barbados are (in order of decreasing net mass):

- United States of America
- United Kingdom
- Dominica
- Trinidad and Tobago
- Venezuela

The five leading recipients of exports (including re-exports) of pesticides from Barbados are (in order of decreasing net mass):

- Trinidad and Tobago
- Jamaica
- St. Lucia
- Antigua
- The Bahamas

Table 2.B: Imports and Exports of Pesticides (2001 data)

Description	Imports (cif) <sup>1</sup>		Domestic Exports (fob) <sup>2</sup>		Re-exports (fob)		Total Exports (fob)	
	Net Mass (kg)	Value (Bds\$) <sup>3</sup>	Net Mass (kg)	Value (Bds\$)	Net Mass (kg)	Value (Bds\$)	Net Mass (kg)	Value (Bds\$)
Insecticides for agricultural use whether or not in retail packages	350,256	2,816,424	140	680	8,580	250,315	8,720	250,995
Mosquito Coils	121,665	463,261	-	-	89,942	319,605	89,942	319,605
Other insecticides in packages for retail sale	214,229	1,319,032	536,544	7,086,361	96,528	509,122	633,072	7,595,483
Other Insecticides	96,973	1,051,710	1,798,910	11,456,192	1,938	66,201	1,800,848	11,522,393
Fungicides	3,929	72,047	3,011	17,840	1,245	6,819	4,256	24,659

Table 2.B: Imports and Exports of Pesticides (2001 data)

Description	Imports (cif) <sup>1</sup>		Domestic Exports (fob) <sup>2</sup>		Re-exports (fob)		Total Exports (fob)	
	Net Mass (kg)	Value (Bds\$) <sup>3</sup>	Net Mass (kg)	Value (Bds\$)	Net Mass (kg)	Value (Bds\$)	Net Mass (kg)	Value (Bds\$)
<b>Herbicides</b>	355,483	2,700,146	-	-	4,593	32,830	4,593	32,830
<b>Anti-sprouting products</b>	1,134	4,527	-	-	-	-	-	-
<b>Plant growth regulators</b>	39,155	157,093	-	-	-	-	-	-
<b>Disinfectants, in retail packages</b>	571,912	1,728,014	1,030	5,264	5,925	21,486	6,955	26,750
<b>Disinfectants, not in retail package</b>	269,976	514,569	93,747	359,787	2,677	21,404	96,424	381,191

Table 2.B: Imports and Exports of Pesticides (2001 data)

Description	Imports(cif) <sup>1</sup>		Domestic Exports(fob) <sup>2</sup>		Re-exports(fob)		Total Exports(fob)	
	Net Mass (kg)	Value (Bds\$) <sup>3</sup>	Net Mass (kg)	Value (Bds\$)	Net Mass (kg)	Value (Bds\$)	Net Mass (kg)	Value (Bds\$)
<b>Rodenticides, in retail packages</b>	23,742	334,534	-	-	1,845	51,666	1,845	51,666
<b>Other rodenticides, not in retail packages</b>	4,251	79,901	209	1,986	574	15,831	783	17,817
<b>Other pest killers, in retail packs</b>	5,412	49,360	-	-	-	-	-	-
<b>Other pest killers, not in retail packs</b>	8,950	116,464	1,697	6,564	311	9,426	2,008	15,990
<b>TOTAL</b>	<b>2,067,067</b>	<b>11,407,082</b>	<b>2,435,288</b>	<b>18,934,674</b>	<b>214,158</b>	<b>1,304,705</b>	<b>2,649,446</b>	<b>20,239,379</b>

<sup>1</sup> cif: cost, insurance and freight – is equal to the cost of the goods at the port in the country of origin plus the value of insurance and shipping charges incurred in the transport of these goods to the importing country

<sup>2</sup> fob: free on board – is equal to the cost of the goods at the port in the country of origin.

<sup>3</sup> Bds\$1 is approximately equal to US\$0.51

### **2.1.2 Fertilisers**

Table 2.C shows the net mass and value of fertiliser imports to and exports from Barbados, using data from the year 2001. These figures are classified by industry group, using definitions developed by the Barbados Statistical Service to represent the principal sectors of economic activity in Barbados.

The five leading sources of fertiliser imports to Barbados are (in order of decreasing net mass):

- United States of America
- Dominican Republic
- Trinidad and Tobago
- Suriname
- Germany

There are only three recipients of exports (including re-exports) of fertilisers from Barbados. These are (in order of decreasing net mass):

- Suriname
- St. Lucia
- Grenada

**Table 2.C: Imports and Exports of Fertilisers (2001 data)**

Industry Group and Description	Net Imports		Domestic Exports	
	Net Mass (kg)	Value (cif) (Bds\$)	Net Mass (kg)	Value (fob)
<b>Unassigned Values</b>	2,811.3	10,952.69	-	-
<b>0: Agriculture, Hunting, Forestry and Fishing</b>	46,689.77	55,790.30	-	-
<b>1: Mining and Quarrying</b>	60,638.92	59,091.03	-	-
<b>2: Manufacturing<sup>1</sup></b>	3,271.42	10,971.65	-	-
<b>3: Manufacturing<sup>2</sup></b>	63,316.38	98,250.00	-	-
<b>5: Construction</b>	6,302.60	15,043.37	-	-
<b>6: Wholesale and Retail Trade</b>	6,748,240.97	3,254,527.18	20,172.66	10,010.02
<b>8: Finance and Business</b>	145,184.83	99,761.71	161.11	938.88
<b>9: Community, Social and Personal Service Activities</b>	370,620.65	1,757,595.06	12.92	10.00
<b>TOTAL</b>	<b>7,447,076.85</b>	<b>5,361,982.99</b>	<b>20,346.69</b>	<b>10,958.90</b>

<sup>1</sup> Includes publishing and printing, manufacture of food and beverages, tobacco, textiles, wearing apparel, luggage, handbags, footwear, wood and wood products, paper and paper products, petroleum products, chemicals and chemical products, and rubber and plastic products.

<sup>2</sup> Includes manufacture of non-metallic mineral products, fabricated metal products, electrical machinery, electric components, precision and optical instruments and equipment, transport equipment, furniture, handicraft items, other manufacturing and recycling.

### **2.1.3 Petroleum Products**

Table 2.D shows the net mass and value of imports and exports of petroleum products in the year 2001.

These products are categorised as either Consumer Goods or Intermediate Goods using the Broad Economic Categories (BEC) system developed by the United Nations Statistics Division. Under this system, consumer goods are defined as those goods manufactured principally for household consumption, while intermediate goods are those used to produce other goods.

The products are further classified into industry groups, using the system developed by the Barbados Statistical Service.

The five leading sources of imports of petroleum products to Barbados are (in order of decreasing net mass):

- Trinidad and Tobago
- Suriname
- United States
- Venezuela
- United Kingdom

The five leading recipients of exports of petroleum products from Barbados are (in order of decreasing net mass):

- Trinidad and Tobago
- Suriname
- Guyana
- St. Vincent and the Grenadines
- Grenada

Table 2.D: Imports and Exports of Petroleum Products (2001 data)

BEC <sup>1</sup>	Industry Group	Net Imports		Domestic Exports	
		Net Mass (kg)	Value (cif) (Bds\$)	Net Mass (kg)	Value (fob) (Bds\$)
Consumer Goods	2: Manufacturing <sup>2</sup>	182.00	2,243.94	-	-
	3: Manufacturing <sup>3</sup>	62.88	1,519.23	-	-
	5: Construction	209.53	1,610.16	-	-
	6: Wholesale and Retail Trade	1,251.82	12,339.26	-	-
Intermediate Goods	Unassigned values	27,583.21	51,968.45	-	-
	0: Agriculture, Hunting, Forestry and Fishing	60.31	462.46	-	-
	1: Mining and Quarrying	159,585,373.48	47,826,320.97	50,913,125.00	18,066,408.00
	2: Manufacturing <sup>2</sup>	1,014,019.74	1,714,392.67	559.56	3,720.85
	3: Manufacturing <sup>3</sup>	65,212.37	2,645,080.24	15,619.50	10,540.00
	4: Electricity, Gas and Water Supply	76.01	5,083.00	-	-
	5: Construction	209,295.51	396,149.42	-	-
	6: Wholesale and Retail Trade	219,606,275.67	112,843,274.30	4,411.20	25,287.04
	7: Transport, Storage and Communication	24,315.83	78,448.72	0.89	10.00
	8: Finance and Business	(8,254.64)	21,711.34	16.32	207.76
	9: Community/Social/ Personal Service Activities	2,370.72	28,044.73	2,804.14	5,422.40
	<b>TOTAL</b>	<b>380,526,328.21</b>	<b>165,610,936.30</b>	<b>50,936,536.61</b>	<b>18,111,596.05</b>

<sup>1</sup>BEC: Broad Economic Classification

<sup>2</sup>Includes publishing and printing, manufacture of food and beverages, tobacco, textiles, wearing apparel, luggage, handbags, footwear, wood and wood products, paper and paper products, petroleum products, chemicals and chemical products, and rubber and plastic products.

<sup>3</sup>Includes manufacture of non-metallic mineral products, fabricated metal products, electrical machinery, electric components, precision and optical instruments and equipment, transport equipment, furniture, handicraft items, other manufacturing and recycling.

### 2.1.4 Consumer Chemicals

Table 2.E shows the net mass and value of imports and exports of consumer chemicals (defined as goods manufactured primarily for household consumption) to and from Barbados, using data for the year 2001. These figures are classified by industry group, using definitions developed by the Barbados Statistical Service to represent the principal sectors of economic activity in Barbados.

**Table 2.E: Trade of Consumer Chemicals for the year 2001**

Industry Group and Description	Net Imports		Domestic Exports	
	Net Mass (kg)	Value (cif) (Bds\$)	Net Mass (kg)	Value (fob) (Bds\$)
<b>Unassigned values</b>	22,211.53	207,556.37	-	-
<b>0: Agriculture, Hunting, Forestry and Fishing</b>	49,417.31	290,450.39	-	-
<b>1: Mining and Quarrying</b>	1,294.82	13,632.33	-	-
<b>2: Manufacturing<sup>1</sup></b>	48,079.01	294,963.24	79,017.68	1,210,451.24
<b>3: Manufacturing<sup>2</sup></b>	17,442.57	100,525.13	0.53	360.00
<b>4: Electricity, Gas and Water Supply</b>	187.88	8,702.36	-	-
<b>5: Construction</b>	2,854.55	29,245.81	-	-
<b>6: Wholesale and Retail Trade</b>	3,323,502.32	31,813,461.70	2,590.47	38,569.38
<b>7: Transport, Storage and Communication</b>	3,516.71	238,497.66	3.38	2,732.62
<b>8: Finance and Business</b>	16,129.17	92,033.93	694.01	6,199.24

<sup>1</sup> Includes publishing and printing, manufacture of food and beverages, tobacco, textiles, wearing apparel, luggage, handbags, footwear, wood and wood products, paper and paper products, petroleum products, chemicals and chemical products, and rubber and plastic products.

<sup>2</sup> Includes manufacture of non-metallic mineral products, fabricated metal products, electrical machinery, electric components, precision and optical instruments and equipment, transport equipment, furniture, handcraft items, other manufacturing and recycling.

## 2.2 Chemical Use by Categories

No quantitative data on national chemical use was found. It was therefore not possible to present information, other than that on imports, about the types and quantities of chemicals used in Barbados, or the sectors in which they are used.

## 2.3 Chemical Waste

There are no existing inventories of hazardous waste generation in Barbados; therefore it is not possible, based on existing data, to present an estimate of the quantities and types of chemical waste generated annually.

As a Party to the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, Barbados occasionally ships hazardous wastes overseas for environmentally sound disposal. Such shipments were made in the years 2001 and 2003. Tables 2.F and 2.G below show the amounts and types of wastes exported. It should be noted that these quantities were voluntarily reported by a small number of companies (three in 2001, two in 2003) wishing to have their waste exported, and therefore should not be taken as representative of overall hazardous waste generation rates in Barbados.

The categories used to classify the waste are those designated by the shipping company that undertook its transportation. Solid waste was quantified in tons, and quantities of liquid waste are expressed in litres.

**Table 2.F: Chemical Waste Exported (2001)**

Type Of Chemical Waste	Quantity
Waste from production, formulation and use of organic solvents	5,872 L
Waste oils/water, hydrocarbons/water mixtures, emulsions	200 L
Residues arising from industrial waste dispersal operations	9 t, 7,000 L
Wastes having as constituents acidic solutions or acids in solid form	2,207 L
<b>TOTAL</b>	<b>9 t, 15,279 L</b>

**Table 2.G: Chemical Waste Exported (2003)**

Type of Chemical Waste	Quantity
Flammable liquids (petroleum distillate)	480 L
Environmentally hazardous substances, liquid (polyglycol ester, ethylene glycol)	10,720 L
Environmentally hazardous substances, solid (polymers, stearates)	12,000 kg
Corrosive solids (zirconyl chloride)	420 kg
Corrosive liquids (sodium silicate solution)	20 L
<b>TOTAL</b>	<b>11,220 L, 12,420 kg</b>

There are no known imports of chemical waste into Barbados.



## 3 Priority Concerns Related to Chemical Production, Import, Export and Use

This chapter provides an overview of the nature of environmental and health problems associated with chemicals production, trade, use and disposal in Barbados. The focus is on those chemicals that have been classified as persistent organic pollutants under the Stockholm Convention, with a number of other chemicals of concern also included for consideration.

### 3.1 Priority Concerns Related to Chemicals Import, Production and Use

Table 3.A provides a quick overview of existing and potential problem areas relating to the management and the industrial and domestic use of chemicals in Barbados. Chemicals listed in the table are those that are generally associated with the problem areas outlined; in many cases data is not available to indicate the extent to which the problem is exhibited in Barbados or which specific chemicals are associated with the nationally identified problem areas.

The priority concerns, which were identified using existing literature and the input of members of the National Profile Task Team, are further discussed in subsequent sections.

**Table 3.A: Description of Problem Areas**

Nature of the Problem	Area	Brief Description of the Problem	Chemicals/Pollutants
<b>Contamination of Groundwater</b>	Island wide	<p>Groundwater quality may be at risk of increased contamination from agricultural activity, the petrochemical industry, industrial facilities, hazardous wastes, urban development and domestic waste disposal.</p> <p>Studies demonstrate that public water supply wells are showing evidence of contamination of ground-water by agro-chemicals. Any significant increase in chemicals use, particularly in abstraction and protection zones, may severely compromise the safety and quality of the water supply.</p>	<p>Chemicals known to be groundwater contaminants: atrazine and metabolites (trade name: Aatrex), nitrates</p> <p>Chemicals posing the potential for ground water contamination: ametryne, sulphates, phosphates, Polycyclic Aromatic Hydrocarbons, Phthalates (Bi-(2-ethylhexyl)-phthalate and di-N-butyl-phthalate), lead oxide, nickel sulphonate, perchloroethene, malathion, diazinon, dursban 4E and commodore W/P, D/P, Methyltetraabutylethylene (MTBE)</p>
<b>Coastal and Marine Pollution</b>	West and South coasts	There is the potential for degradation of sensitive coastal ecosystems and associated species and coastal water quality (coral reefs, mangroves, seagrass beds etc.) if agrochemicals are mis- or over-used.	Polycyclic aromatic hydrocarbons, organotin compounds (tributyl tin), nitrates, phosphates
<b>Chemical Residues in Food</b>	Unknown	There is the potential for food to be contaminated by agro-chemicals. Chemicals may also bio-accumulate in fish due to contamination of marine waters.	Agro-chemicals.

**Table 3.A: Description of Problem Areas**

Nature of the Problem	Area	Brief Description of the Problem	Chemicals/Pollutants
<b>Impacts on Biodiversity</b>	Island wide (Particularly the Scotland District and coastal and marine areas)	Contamination by agro-chemicals of underground water supplies, near shore waters and biota is not well documented for Barbados, but it is generally recognised as a threat to biodiversity.	Chlorinated hydrocarbons, organo-phosphates, pyrethroids, triazines, amides, dinitroanilines, sulphonyl urea, uracil, triazole, diazole, diazine, morpholines, cyanide generators, hypercalcaemics, bipiridils, benzimidazole, dithiocarbamates, heavy metals.
<b>Air Contamination</b>	Island wide	Air pollutants are produced by all combustion processes including burning and incineration of solid waste.  Indoor air quality is an increasingly serious concern; poor air quality is sometimes found to result from the inappropriate use of pest control or industrial cleaning chemicals in or near office environments.	Dioxins and furans, pest control chemicals, industrial cleaning chemicals.
<b>Hazardous Waste Treatment/Disposal</b>	Island wide	The inappropriate disposal of chemicals into gullies and drains poses a threat to human and environmental health. The lack of a designated hazardous waste management/disposal facility hinders safe disposal of hazardous waste.	Zinc phosphates, nitrates, cadmium, ethylene diamine, sulphuric acid, mercury, chloroform, propylene glycol, chromic acid, nitric acid, manganous nitrate solution, toluene, isopropyl alcohol, cadmium, phosphoric acid, chromic acid, methylene chloride, amines, diethyl ether.

**Table 3.A: Description of Problem Areas**

Nature of the Problem	Area	Brief Description of the Problem	Chemicals/Pollutants
<b>Storage/Disposal of Obsolete Chemicals</b>	Island wide	<p>The safe disposal of stockpiles of obsolete chemicals is a major concern. There is a lack of information on the presence, type, size and location of such stockpiles.</p> <p>Long-term storage of chemicals can result in containers being damaged and degraded, with the potential for leakage.</p>	Endosulphan, alkylated naphthalene sulphonate, tetra potassium pyrophosphate, benzene, benzaldehyde, ethylene glycol, triethylene glycol, xylene, perchloroethylene, polycyclic aromatic hydrocarbons, carbon tetra chloride, sodium metabisulfite, ethoxylated methyl glucoside dioleate, and tetrapotassium pyrophosphate and others.
<b>Soil Contamination</b>	Localised unknown areas	<p>Improperly maintained, aged, and leaking petroleum storage tanks can result in contamination of soils.</p> <p>Improper disposal of waste oils, particularly from vehicle maintenance facilities and service stations, is also a cause for concern.</p>	Polycyclic aromatic hydrocarbons, waste oils
<b>Occupational Health</b>	National	<p>There is a general lack of sensitivity to the need for use of protective equipment in the agricultural and industrial sectors. Training, education and greater public awareness are required at all levels.</p> <p>There are concerns about the use of pesticides indoors affecting air quality at the workplace. Concerns also exist about risks posed by failures to follow packaging and MSDS instructions at all levels, including in domestic usage.</p>	Pesticides.

## 3.2 Ranking of Priority Areas of Concern

Table 3.B (Priority Concerns Related to Chemicals) provides additional information and a general analysis with respect to identified problem areas while also ranking the identified concerns.

The levels of concern and priority rankings were determined using the input of stakeholders participating in the National Consultation on Chemicals Management held in June 2003. A preliminary list of potential problems was presented to the participants, who were invited to propose additions and amendments to this list. Participants then evaluated, as a group, and using a scale of medium, high, and low, the level of concern that they would attribute to each identified problem area, based upon the potential for negative environmental and human health impacts. Stakeholders also assigned each area of concern with a priority ranking. Problems deemed to be in the most pressing need of attention were ranked as 1, or high priority, while less immediate concerns were assigned lower rankings of 2 or 3. Several issues for which data is unavailable have been assigned a high priority ranking, representative of the urgent need for data to allow evaluation of the scope of the problems identified.

**Table 3.B: Priority Concerns Related to Chemicals**

Nature of Problem	Scale of Problem	Level of Concern	Ability to Control Problem	Availability of Statistical Data <sup>1</sup>	Priority Ranking <sup>2</sup>
<b>Contamination of groundwater</b>	National	High	Low	Sufficient	1
<b>Coastal and marine pollution</b>	National	High	Low	No data	1
<b>Impacts on biodiversity</b>	National	High	Low	No data	1
<b>Air contamination</b>	National	Low	High	No data	2
<b>Hazardous waste treatment/Disposal</b>	National	High	Medium	Sufficient	1
<b>Storage/Disposal of obsolete chemicals</b>	National	High	Low	Sufficient	1
<b>Soil Contamination</b>	No data	Low	No data	No data	3
<b>Occupational Health</b>	National	High	High	No data	1
<b>Chemical residues in food</b>	National	High	Medium	No data	2

**<sup>1</sup> Sources for statistical data:**

Barbados Water Authority (1997). Water Quality Analysis for the Water Resources Management and Water Loss Study.

British Geological Survey/Ministry of Health (1991). Groundwater Quality Studies for a Pollution Risk Assessment in Barbados.

Barbados Water Authority Water Quality Monitoring Programme.

Hazardous Chemicals/Substances Survey and Inventory 1995-1998

**<sup>2</sup> Priority Ranking:**

1: High priority 2: Medium priority 3: Low priority

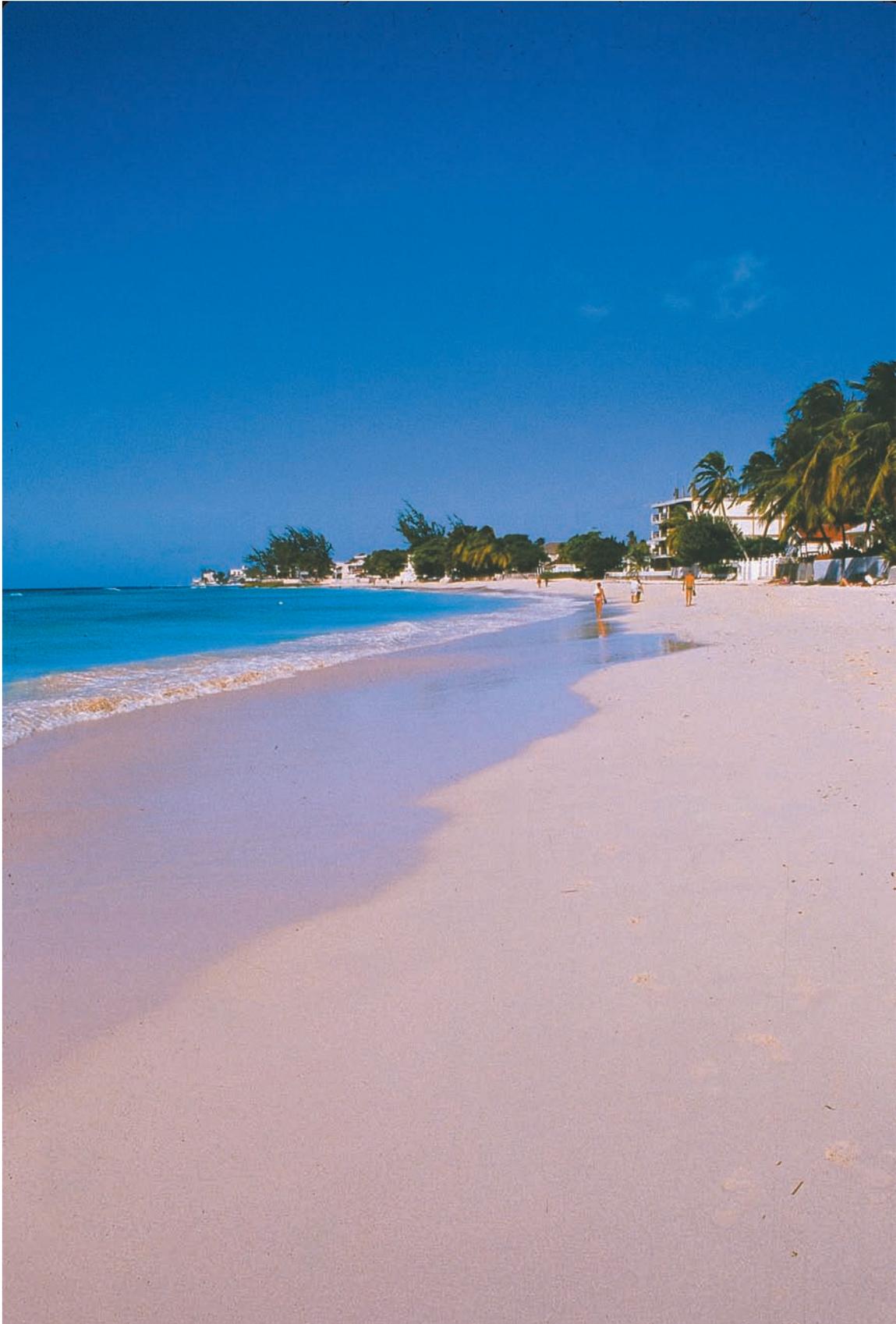
### 3.3 Comments/Analysis

Generally there is not sufficient data available to inform clear conclusions and decision making regarding the priority concerns for Barbados in relation to chemical production, trade, use and disposal. Singh (2002) identified the following missing data gaps:

- Comprehensive inventories focusing on persistent toxic substances and other chemicals have not yet been conducted in Barbados. Hence complete understanding of the prevalence of these substances and their effects is lacking.
- There are many substances stockpiled, the nature of which may be unknown due to improper labelling or because the chemical composition of the substance is regarded as a trade secret.
- Data has yet to be collated to determine the relationship between national levels of environmental contamination and human health.

Information on the impacts of persistent organic pollutants and other chemicals on human and environmental health is needed in Barbados. There is also a need for a systematic approach to identifying the types and quantities of chemicals in use or stockpiled in Barbados. A national monitoring and inventory programme would help to provide information to determine what kinds of strategies should be implemented to address the identified concerns.

In recognition of the close proximity of the Caribbean islands and the common problems faced in terms of impacts on economy and environment, consideration should be given to regional co-operation and the development of common, regional policies and approaches to chemicals management.



## 4 Legal Instruments and Non-Regulatory Mechanisms for Managing Chemicals

This chapter seeks to provide an overview of the existing legal instruments which make either specific or general reference to the management of chemicals. It is to be noted that the term 'chemical' has been used here in its broadest sense to include both raw chemicals, and products that might include potentially hazardous chemicals as constituents.

### 4.1 Overview of National Legal Instruments Which Address the Management of Chemicals

Table 4.A lists existing laws and regulations that are relevant to the management of chemicals in Barbados. For each legal instrument listed the ministry responsible for its implementation is identified, as are the classes of chemicals it covers. A summary of the scope of each instrument, as indicated by its short title, is provided, and the sections, articles and provisions that address issues of chemicals management are identified and/or summarised. The enforcement status of these instruments varies widely. Research carried out in the preparation of this Profile suggests that a number of these Acts, e.g. the Sale of Poisons Act and the Fertilisers and Feeding Stuffs Act, are enforced very weakly, if at all.

It is of note that there is a recommendation, arising from the work of the Chemical Substances Technical Working Group (see Section 7.2.2), that a Hazardous Chemicals Control Act should be developed to regulate the management of all hazardous chemicals, including pesticides, and to therefore facilitate the goal, as put forward by the Working Group, of preventing or minimising the public and environmental health risks associated with hazardous substances handling and usage in Barbados.

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<b>Health Services Act (Cap. 44) – 1969</b>	Ministry of Health	All	<b>Short Title:</b> <i>“an Act relating to the promotion and preservation of the health of the inhabitants of Barbados”</i>	<p><b>Building Regulations - 1969</b></p> <p>Section 12: A person shall not discharge any sullage or any waste matter into any street or into any public place except as approved by the Medical Officer of Health.</p> <p><b>Control of Drugs Regulations - 1970</b></p> <p>Defines the mechanisms by which drugs engaged in the health services may be imported into, manufactured and distributed in Barbados.</p> <p><b>Control of the use of Artificial Sweeteners in Food Regulations - 1970</b></p> <p>Regulates the sale and use of calcium cyclamate, magnesium cyclamate, potassium cyclamate and sodium cyclamate as artificial sweeteners used in food, and of any other substance derived from cyclamic acid.</p>

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
Health Services Act (Cap. 44) – 1969 (cont'd)				<p><b>Nuisances Regulations - 1969</b></p> <p>The regulations define nuisances to be</p> <ul style="list-style-type: none"> <li>• 'any place, matter, thing, deposit or accumulation of liquid or solid matter that is full, in such a state, or so placed, made or left, as to be unsanitary, injurious or dangerous to health or likely to become so' (section 3/1); and</li> <li>• 'any discharge, except in accordance with a permit granted by the Minister or Medical Officer of Health, of any industrial waste or other noxious matter on or to any course, pond, ditch, drain or other place' (section 3/15).</li> </ul> <p><b>Offensive Trades Regulations - 1969</b></p> <p>Chemical or acid making, soap boiling and several other industrial processes are included in a schedule of offensive trades which may only be executed under licence by the Medical Officer of Health.</p>

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<b>Sale of Poisons Act (Cap. 151) – 1885</b>	Ministry of Health	Various	<b>Short Title:</b> “An Act to regulate the sale of poisons”	Requires that no poison be sold by any person, either wholesale or retail, unless the container is distinctly labelled with the name of the article and the word ‘poison’, and with the name and address of the seller.
<b>Explosive Act (Cap. 162) October 11, 1890 – Part 1 February 14, 1918 – Part 2</b>	Ministry of Home Affairs	Explosives	<b>Short Title:</b> “An Act to consolidate and amend the Acts relating to Merchants gunpowder and to regulate the importation and sale of certain explosives”	Provides coverage for import, transportation and storage of blasting powder, gun-cotton, dynamite, nitroglycerine and all other explosive matter whatsoever.
<b>Barbados Port Inc. (Transfer of Management and Vesting of Assets) Act 2003-13 and Harbours Regulations 1961</b>	Ministry of International Transport	All	<b>Long Title:</b> “An Act to provide for the Port of Bridgetown to be managed by Barbados Port Inc., a company incorporated under the Companies Act, for the purpose of enabling the port to operate as a commercial entity to transfer the assets and liabilities of the Government of Barbados in relation to the operation of the Port of Bridgetown to the Barbados Port Inc.; to repeal the Barbados Port Authority Act; and to provide for related matters.”	Part VII of the Regulations, “Dangerous, Hazardous and Poisonous Goods”, provides <i>inter alia</i> for prior notification of intention to land such goods, and procedures to be followed by ships while in Port.

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<b>Fuel Oil Act (Cap. 164A) – 1917</b>	Ministry of Energy and Public Utilities	Fuel Oil	<b>Short Title:</b> "An Act relating to the importation and storage of fuel oil."	Empowers the Minister to regulate the landing, storage, and keeping of fuel oil.
<b>Shipping (Oil Pollution) Act (Cap. 296A) – 1994</b>	Ministry of International Transport	Crude Oil, Fuel Oil, Lubricating Oil	<b>Short Title:</b> "An Act to make provision concerning oil pollution of navigable waters by ships, to provide for civil liability for oil pollution by ships and to give effect to certain international conventions relating to pollution of the sea."	<p>The Act covers:</p> <ul style="list-style-type: none"> <li>the discharge of oils and mixture from Barbadian ships (section 4);</li> <li>the discharge of oil into the territorial waters of Barbados (section 5);</li> <li>the discharge of certain oils from pipelines and exploration areas (section 6);</li> <li>the discharge of ballast water into ports, and the provision of port facilities for the disposal of oil residues (sections 11 and 12).</li> </ul>

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<b>Storage of Petroleum Act (Cap. 172) – 1882</b>	Ministry of Energy and Public Utilities	Volatile Petroleum	<b>Short Title:</b> “An Act to consolidate and amend the law relating to the storage and importation of petroleum”	Governs importation and warehousing of volatile petroleum and other inflammable liquid. Empowers the Minister to make and amend related rules and regulations.  <b>Licensing Regulations - 1929</b> Regulations govern the licensing of volatile petroleum importation, sale and storage. Offers design guidance on the distances between storage tanks.
<b>Fertilisers and Feedings Stuffs (Cap. 261) – 1961</b>	Ministry of Agriculture	Fertilisers	<b>Short Title:</b> “an Act to amend the law with respect to the sale of fertilisers and feeding stuffs.”	Provides for the registration of fertilisers and feedstuffs by the Chief Agricultural Officer, and for the regulation of imports, manufacturing, labelling and sale.
<b>Highways Act (Cap. 289) – 1900</b>	Ministry of Public Works and Transport	Fireworks	<b>Short Title:</b> “an Act to make provisions in relation to highways in the island”	<b>Section 43</b> Prohibition against the discharge of fireworks on highways.
<b>Carriage of Goods by Sea (Cap. 301) – 1981</b>	Ministry of International Transport	All	<b>Short Title:</b> “An Act to provide for the implementation in Barbados of the United Nations Convention on the Carriage of Goods by Sea, 1978”	<b>Section 13, Special rules on dangerous goods.</b> Requires the shipper to label in a suitable manner dangerous goods as dangerous, and to provide information, if necessary, of the precautions to be taken.

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<p><b>Factories Act (Cap. 347) – 1984</b></p>	<p>Ministry of Labour</p>	<p>All</p>	<p><b>Short Title:</b> “an Act to revise and consolidate the law relating to factories and the safety, health and welfare of persons employed therein”</p>	<p>General provision for Occupational Health and Safety issues and for factory inspections.</p> <p><b>Section 11:</b> Fencing of places containing dangerous substances.</p> <p><b>Section 26:</b> Storage of gas or dangerous liquid.</p> <p><b>Section 27:</b> Precautions with respect to explosive or inflammable dust, gas, vapour or substance.</p> <p><b>Section 45:</b> Disposal of wastes and effluents.</p> <p><b>Section 60:</b> Protection of workers against gases, dusts and fumes.</p> <p><b>Section 61:</b> Meals in certain dangerous trades.</p> <p><b>Section 67:</b> Provisions as to employment of person in processes involving lead compounds.</p> <p><b>Section 68:</b> Importation and sale of materials and articles made with prohibited materials.</p> <p><b>Section 104(I):</b> Maximum allowable concentrations of dusts, fumes and other hazardous substances in the working environment.</p>

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<b>Pesticides Control Act (Cap. 395) – 1974</b>	Ministry of Agriculture	Pesticides	<b>Short Title:</b> “An Act to provide for the control of the importation, sale, storage and use of pesticides”	<p>The Act</p> <ul style="list-style-type: none"> <li>• defines functions of the Pesticides Control Board, exercisable powers of Inspectors, and</li> <li>• Empowers the Minister to make regulations in all areas of Pesticide Management (import, manufacture, transportation, use, disposal, etc.)</li> </ul> <p><b>Pesticides Control Regulations (1974)</b></p> <p>Regulate the manufacture, import, storage, use, distribution and sale of approved pesticides.</p> <p><b>Labelling of Pesticides Regulations (1976)</b></p> <p>Regulate the labelling of pesticides which are distributed, exposed or offered for sale.</p>

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<b>Control of Standards Act (Cap. 326A) – 1981</b>	Ministry of Commerce	All	<b>Short Title:</b> "An Act to provide for the control of standards and the labeling of commodities"	<ul style="list-style-type: none"> <li>• Defines standard specification to be obligatory if it is intended primarily to protect the consumer against danger to health or safety.</li> <li>• No person shall label commodities contrary to the Barbados National Standard.</li> <li>• Where Imports do not comply with the relevant obligatory standard specification, the import shall not be admitted for distribution in Barbados.</li> </ul> <p>Relevant Standards already available include:</p> <ul style="list-style-type: none"> <li>• BNS 8: 1987 - Specification for Pictorial Marking for Handling of Goods (General Symbols)</li> <li>• BNS 44: 1978 - Specification for Pictorial Marking for Handling and Labeling of Dangerous Goods.</li> <li>• BNS 45: 1980 - Specification for Classification of Hazardous Chemicals and Chemical Products</li> <li>• BNS 46: 1982 - Specification for Classification of Dangerous Goods.</li> </ul>

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

Legal Instrument	Responsible Ministries or Bodies	Chemical Use Categories	Objective of Legislation	Relevant Articles/Provisions
<b>Marine Pollution Control Act – 1998</b>	Environmental Protection Department	All	<b>Short Title:</b> "An Act to prevent, reduce and control pollution of the marine environment of Barbados from whatever source."	Section 3 states that "no person shall release or cause to be released any pollutant into the environment which is in violation of any applicable standards, conditions or requirements specified under this Act or regulations."  The Act charges the Head of the Environmental Protection Department to investigate, characterise and define the extent of pollution and significant sources of pollution from land-based sources, sea-bed activities, dumping activities and airborne sources.
<b>Coastal Zone Management Act – 1998</b>	Coastal Zone Management Unit	Explosives, poisons, or other noxious substances	<b>Short Title:</b> "An Act to provide for the more effective management of the coastal resources of Barbados, for the conservation and enhancement of these resources and for matters related thereto."	Section 27 makes it an offence to use or permit to be used "any explosive, poison or other noxious substance" for the purpose of harvesting coral or catching, taking or harvesting fish.  Section 29 prohibits the fouling of the foreshore with offal or garbage.

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

Key legal instruments specifically intended to facilitate the effective control and management of chemicals are the Health Services (Control of Drugs) Regulations, 1970 and the Pesticides Control Act, with its accompanying regulations.

### 4.2.1 Health Services (Control of Drugs) Regulations, 1970

The Health Services (Control of Drugs) Regulations, 1970, regulate the importation, manufacture, production and distribution of all drugs in Barbados. Under the Regulations drugs are 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 physical state, or the symptoms thereof in man or animal;*
  - (b) restoring, correcting or modifying organic functions in man or animal, and includes –*
  - (c) any substance or mixture of substances in common use when intended to be used as a drug;*
  - (d) any substance or mixture of substances manufactured, sold or represented for use in –*
    - (i) cleansing, improving or altering the complexion, skin, hair, or teeth, or*
    - (ii) disinfection in premises in which food is manufactured, prepared or kept, for the control of vermin in those premises.*

Section 8 of the Regulations controls the manufacture and production for sale of drugs in Barbados, requiring:

- That persons engaged in the business of manufacturing or producing drugs for sale should be licensed;
- That the process of manufacturing or producing drugs should be directed and supervised by a druggist;
- That each batch of every drug manufactured or produced should be numbered and a sample of each batch submitted to an analyst for analysis and assay as approved by the Chief Medical Officer;
- That every container in which a drug is sold should carry a label stating the ingredients, their quantities per unit dose, the batch number and, where appropriate, the expiration date.

Under Section 9 of the Regulations, the import and distribution of drugs listed in the Third Schedule by persons other than:

- A medical practitioner
- A dentist
- A veterinary surgeon
- A wholesale dealer
- A druggist carrying on a retail business
- A government hospital
- A licensed private hospital
- A licensed nursing home
- A licensed maternity home
- The Barbados Family Planning Association in relation to an oral contraceptive

requires issuance of a licence by the Minister or person authorised by the Minister.

Section 10 of the Regulations prohibits the importation, manufacture, sale, distribution or use of thalidomide, L.S.D., mescaline and all other hallucinogenic substances, except under licence issued by the Minister or person authorised by the Minister.

The Regulations allow for the appointment of drug inspectors to investigate compliance with the Regulations. Additionally, Section 8 of the Health Control Act allows for the Minister to appoint a Drug Control Advisory Committee to advise on matters relating to the control of drugs, and the amendment of any Schedules within the Regulations.

#### **4.2.2 Pesticides Control Act**

The Pesticides Control Act (1974) is *“an Act to provide for the control of the importation, sale, storage and use of pesticides”*. Accompanying regulations include:

- Pesticides Control (Approval of Pesticides) Regulation, 1974; and
- Pesticides Control (Labelling of Pesticides) Regulation, 1976.

The Act and its attendant regulations make provision for:

- Prohibiting the manufacture, packaging, importation, advertisement, sale and use of particular pesticides or classes of pesticides;
- Controlling the manufacture, packaging, importation, transportation, advertisement and sale or other distribution of particular pesticides or classes of pesticides;
- Controlling the use of pesticides in agriculture generally or on particular crops or pests;
- Controlling the use of pesticides on produce during its storage and transportation;
- Setting out the conditions under which pesticides are to be stored;

- Protecting workers against the risk of poisoning or other injury by pesticides;
- Prescribing the permissible level of any pesticide in any particular kind of produce at the time of marketing;
- Controlling the quantities of pesticides which may be imported or manufactured and the types of containers in which such substances may be imported, transported, offered for sale or otherwise distributed;
- Controlling the labelling of containers, their subsequent disposal and the disposal of unwanted stocks of pesticides;
- Requiring the keeping and inspection of records and the furnishing of returns and other information with respect to pesticides;
- Restricting and prohibiting the use of particular pesticides or classes of pesticides;
- Imposing restrictions and obligations on pest control operators;
- Imposing duties on employer, workers and others in respect of the occupational safety and health of persons working with pesticides;
- Prescribing standards for the composition of pesticides;
- Requiring licences to manufacture, import, package, sell or otherwise distribute or use any pesticide.

The Act establishes a Pesticides Control Board to carry out the provisions of the the Act and Regulations, and allows for the designation of inspectors to investigate compliance with the Act and Regulations.

### **4.3 Existing Legislation by Use Category Addressing Various Stages of Chemicals from Production/Import through Disposal**

Table 4.B provides an overview of the legal instruments that apply to the regulation of the various categories of chemicals at each stage of chemicals management, from production/import through disposal.

**Table 4.B: Overview of Categories of Chemicals for which Legal Instruments of Control Exist**

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

x= stage adequately addressed through legislation

## 4.4 Summary Description of Key Approaches and Procedures for Control of Chemicals

The key policy approaches and procedures for chemicals management in Barbados are carried out under the Health Services (Control of Drugs) Regulations, 1970, and the Pesticides Control Act, as described in Section 4.2.

### 4.4.1 Health Services (Control of Drugs) Regulations, 1970

The Third Schedule of the Health Services (Control of Drugs) Regulations lists chemicals for which importation and distribution are controlled. These drugs are listed in Table 4.C.

**Table 4.C: Drugs listed in the Third Schedule of the Health Services (Control of Drugs) Regulations, 1970**

Amidopyrine	Aminopterin
Amitriptyline, Protriptyline, Imipramin, and all other anti-depressant substances	Amphetamine, Methyl Phenidate Hydrochloride, Pipradol Hydrochloride, and all other stimulants of the Central Nervous System, except caffeine and ephedrine
Apiol	Barbituric Acid
Bromoform	Calcium Carbimide and all other drugs used in the treatment of alcoholism
Carbromal, Paraldehyde, Sulphonal and all other hypnotic substances	Carbutamide, Tolbutamide, Phenformin and all other anti-diabetic substances for oral use
Chloral hydrate (except in preparations for external use containing not more than 1% W/V of Chloral hydrate)	Chlorcyclizine (except in preparations for external use only)
Chloroquine, Hydrochloroquine	Chlorpromazine, Promazine, Diazepam, and all other tranquilising substances
Corticotrophin, Cortisone, Prednisone and all other organic or synthetic adrenocortical substances	Cyclizine
Dithiazanine Iodide	Ectylurea

**Table 4.C: Drugs listed in the Third Schedule of the Health Services (Control of Drugs) Regulations, 1970**

Ergot	Heparin, dicoumarol, phenindione, Warfarin and all other anti-coagulants except when used as rodenticides
Hexachlorophene except in preparations containing 0.1% or less of hexachlorophene	Hexamethonium, Pentamethonium, Rauwolfia, Veratrum and all other hypotensive substances
Indomethacin	Isoniazid, Para-aminosalicylic acid, Ethionamide, Pyrazinamide and all other anti-tuberculosis substances for oral use
Meclizine	Mefenamic Acid, Flufenamic Acid
Mustine, Busulphan, melphalan and all other neoplastic substances	Nitrofurazone, Furazolidone, Nitrofurantoin, and all other furan derivatives
Para-aminobenzene sulphonamide	Penicillin, Chloramphenicol, Streptomycin, Tetracycline, and all other antibiotics whether produced synthetically or by living micro-organisms
Phenylbutazone	Phenylcinchoninic Acid, Salicycinchoninic Acid
Phenelzine, Pheniprazine, and all other monoamine oxidase inhibitors	Phenytoin, Paramethadione, Primidone, and all other anti-convulsant substances
Procaine, Lignocaine, Benzocaine, and all other local anaesthetic substances (except when included in preparations used exclusively for external application)	Sex Hormones, except in cosmetic preparations which are demonstrated to be without systemic effects
Thiabendazole	Thiouracil and all other anti-thyroid substances
Thyroid and all other organic or synthetic Thyroid-like substances	

#### **4.4.2 Pesticides Control Act**

The Pesticides Control Board has banned or severely restricted the use of thirty-three (33) pesticides. These are listed in Table 4.D.

Among these 33 banned or severely restricted substances are six of the nine pesticides specified as persistent organic pollutants under the Stockholm Convention. These six are aldrin, chlordane, DDT, dieldrin, endrin and heptachlor. The other three POPs pesticides – hexachlorobenzene, mirex and toxaphene – have not been designated as either banned or severely restricted by the Pesticides Control Board.

Table 4.D: Banned and Severely Restricted Pesticides

Trade Name	Common Name	Level of Restriction [ban (B) or restriction (R)]	Date of Action	Details of restriction (e.g. reasons for control action, remaining allowed uses, etc.)
ALDRIN	Aldrin	B	1987-09-24	
ARKOTINE D18	DDT	B	1967-06-11	
AZODRIN	Monocrotophos	B		
BIDRIN	Dicrotophos	B		
BHC DUST		B		
BROMADIOLONE	Bromadiolone	B	1979-01-25	High toxicity.
CHLORDANE	Chlordane	B	1986-12-31	EPA guidance on oncogenicity, and General misuse by the public.
DIELDRIN	Dieldrin	B		

Table 4. D: Banned and Severely Restricted Pesticides

Trade Name	Common Name	Level of Restriction [ban (B) or restriction (R)]	Date of Action	Details of restriction (e.g. reasons for control action, remaining allowed uses, etc.)
DYNAP	Dinoseb	B	Aug. 1989	Based on EPA "Emergency Suspension Order" (1986-10-07) on all uses of herbicides containing dinoseb.
ENDOSULPHAN	Endosulphan	B		
ENDRIN	Endrin	B		
E.P.N.	Dichlorofenthion	B	1987-10-27	Toxicity.
FOLIDOL M	Parathionmethyl	B		
FURADAN 4F	Furadan 4F	B		
FURADAN 10G	Furadan 10G	R		
GALECRON	Chlordimeform	B		

Table 4.D: Banned and Severely Restricted Pesticides

Trade Name	Common Name	Level of Restriction [ban (B) or restriction (R)]	Date of Action	Details of restriction (e.g. reasons for control action, remaining allowed uses, etc.)
HEPTACHLOR	Heptachlor	B		
MARSHALL 25EC	Carbosulfan	B	1991-02-14	Failure by farmers to comply with harvest limit.
NEMAGON	DBCP (dibromo- chloropropane)	B	1980-01-16	Suspended under the recommendation of the USEPA. Only for use with pineapples.
PHOSVEL	Leptophos	B		
POLYOXIN A1	Polyoxin B	B		Public health risk.
RAMROD		B	1979-07-04	
RENTOKIL LINDANE GEL	Lindane	B	1989-04-25	

Table 4.D: Banned and Severely Restricted Pesticides

Trade Name	Common Name	Level of Restriction [ban (B) or restriction (R)]	Date of Action	Details of restriction (e.g. reasons for control action, remaining allowed uses, etc.)
STREPTOMYCIN 20WP	Streptomycin sulphate	B	1979-01-25	Risk to health of human beings. Fears that if used on crops, resistant strains may result, which may cause medical and public health problems.
TAMARON	Methamidophos	B		
TERRACUR	Fensulfothion	B		
VEGATROL A-4AT	2,2,5-T	B	1980-03-27	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
VYDATE L	Oxamyl	B	1968-05-17	
WEEDAR 2,4,5-T		B	1980-01-16	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
WEEDONE BRUSH KILLER 64		B	1975-05-07	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
WEEDONE LV6		B	1975-05-07	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
WEEDONE 2,4,5-TP		B	1975-05-17	EPA suspension of pesticides containing 2,4,5,T due to their carcinogenicity.
METHYL BROMIDE		R		

## **4.5 Non-Regulatory Mechanisms for Managing Chemicals**

Apart from due diligence employed by stakeholders employed in the manufacture and trade in chemicals, no comprehensive non-regulatory processes exist as appropriate supplements to the formal regimes for chemical management.

## **4.6 Comments/Analysis**

There are several gaps in the formal mechanisms established for chemicals management in Barbados. This is reflective of the sectoral interests accorded to this matter, largely in subdivisions of the Health and Agriculture industries. Recent considerations have identified the need for a more comprehensive and modern management regime to address identified deficiencies and to ensure compliance with selected international treaties and obligations. To this end, the Ministry of Housing, Lands and the Environment is formulating a comprehensive policy of Hazardous Substances Management through the Chemicals Substances Technical Working Group (CSTWG). The Policy will make provisions for the regulatory control of hazardous substances over all aspects of the life cycle, and is likely to be integrated within the proposed National Environmental Management Act. Additionally, the Ministry of Labour is presently working on an Occupational Health and Safety Act. This is intended to replace the Factories Act, and is expected to offer wider coverage of workplace occupational health and safety management issues. It is anticipated that the combined effect of the introduction and enforcement of these new pieces of legislation would lead to significant improvements in the coverage and effectiveness of the management regime that currently prevails.



## 5 Ministries and Government Agencies Managing Chemicals

This chapter briefly outlines the roles and responsibilities 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

Table 5.A provides a general overview of ministerial responsibilities for, and involvement in, each stage of the chemicals management process, from production/importation through disposal.

Table 5.A: Responsibilities of Government Ministries

Ministry Concerned	Stages of Life Cycle							
	Importation	Production	Storage	Transport	Distribution and/or Marketing	Use/Handling	Disposal	
Environment			x			x	x	
Health	x	x	x		x	x	x	
Agriculture	x	x	x		x	x		
Labour			x			x	x	
Commerce					x			
Home Affairs	x		x	x				
International Transport			x	x				
Energy and Public Utilities	x		x		x	x		
Finance		x						

## **5.2 Descriptions of Ministerial Authorities and Mandates**

Brief descriptions of the responsibilities and activities of each ministry/agency mentioned in Table 5.A are presented below. Where applicable, reference is made to the relevant subsidiary agencies with specific responsibility for or involvement in national chemicals management.

### **5.2.1 Ministry of Housing, Lands and the Environment**

Through the Environmental Protection Department (EPD), the Ministry of Housing, Lands and the Environment performs the regulatory functions enshrined in the Marine Pollution Control Act. The Act empowers the Head of the EPD to investigate, characterise and define the extent of pollution and significant sources of pollution from land-based sources, sea-bed activities, dumping activities and airborne sources.

The EPD is also responsible for the implementation of the Basel and Stockholm Conventions in Barbados, and is one of two designated National Authorities (the other is the Ministry of Agriculture and Rural Development) for the implementation of the Rotterdam Convention. Under the Basel Convention, the Department oversees the exportation of hazardous waste for environmentally sound disposal overseas. Under the Stockholm Convention, the Department is responsible for the development of a National Implementation Plan for the management of persistent organic pollutants.

### **5.2.2 Ministry of Health**

The Ministry of Health dictates the regulatory function of the Health Services Act. The Act includes two regulations relevant to chemicals management. These are the Control of Drugs Regulations and the Use of Artificial Sweeteners in Food Regulations. The importation, manufacture and distribution of drugs, and the sale and use of artificial sweeteners in food, are controlled by these regulations.

The Ministry of Health is also responsible for administration of the Sale of Poisons Act, which governs the sale and distribution of poisonous substances to householders.

Through the Sewerage and Solid Waste Project Unit, the Ministry of Health is also responsible for the development of a hazardous waste policy, hazardous waste storage facilities, and the operation of such facilities.

### **5.2.3 Ministry of Agriculture and Rural Development**

The Ministry of Agriculture and Rural Development is the lead agency for the Pesticides Control Act and accompanying regulations, which govern the licensing, importation, manufacture, storage, labelling, distribution, sale, use, handling and disposal of pesticides.

The Ministry of Agriculture and Rural Development is also responsible for the Fertilisers and Feeding Stuffs Act, which provides for the registration and control of the importation, manufacture, labelling and sale of fertilisers and feedstuffs.

Additionally, the Ministry is one of the designated National Authorities (the other is the Environmental Protection Department) for the implementation of the Rotterdam Convention in Barbados. A representative from the Ministry represents the Caribbean on the Interim Chemical Review Committee

for the Prior Informed Consent Procedure. The Ministry of Agriculture and Rural Development is also a key supporting agency for the implementation of the Stockholm Convention.

#### **5.2.4 Ministry of Labour**

Under the Factories Act, the Ministry of Labour regulates matters concerning occupational health and safety in the workplace.

#### **5.2.5 Ministry of Commerce**

The Barbados National Standards Institution (BNSI), in the Ministry of Commerce, Consumer Affairs and Business Development, is the authority responsible for the execution of the Control of Standards Act. In this regard the BNSI specifies standards for pictorial marking for handling of goods, handling and labelling of dangerous goods, and classification of hazardous chemicals, chemical products and dangerous goods.

#### **5.2.6 Ministry of Home Affairs**

The Central Emergency Relief Organisation (CERO) and the Barbados Fire Service, both agencies in the Ministry of Home Affairs, play crucial roles in emergency response. The Fire Service is a key response agency in events of chemicals spills or fires. The Service also educates the public about risk management and hazard reduction. CERO is involved in the coordination of response to emergency incidents, as well as education and awareness raising about emergency preparedness and response.

The National Council on Substance Abuse also plays a role in chemicals management, through efforts to control the import, production and export of chemical precursors to illegal narcotics.

#### **5.2.7 Ministry of International Transport**

Barbados Port Inc. is responsible for the implementation of the Barbados Port Inc. (Transfer of Management and Vesting of Assets) Act, the Carriage of Goods by Sea Act, and the International Maritime Dangerous Goods Code. These instruments mandate that the Barbados Port Inc. ensures the safe transportation, carriage, storage and handling of dangerous and offensive goods that are imported or exported via the island's ports of entry.

#### **5.2.8 Ministry of Energy and Public Utilities**

Under the Fuel Oil Act and the Storage of Petroleum Act, the Ministry regulates the importation, landing, storage and keeping of fuel oil, volatile petroleum and flammable liquids.

#### **5.2.9 Ministry of Finance**

The Customs and Excise Department, which comes under the umbrella of the Ministry of Finance, monitors and regulates the import and export of all chemicals and hazardous substances to and from Barbados. It is through the Customs Department that import, export, and trade restrictions imposed by other regulatory agencies are enforced.



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

There are a variety of chemicals management stakeholders in Barbados in addition to Government Ministries, Departments and Statutory Boards. This chapter identifies a number of these non-governmental stakeholders, briefly describes their involvement in the chemicals management framework and outlines the types of expertise and experience associated with each organisation. It should be noted that this chapter is not intended to constitute an exhaustive list of all non-governmental chemicals management stakeholders.

### 6.1 Description of Organisations

#### 6.1.1 Regional and International Organisations

Barbados is home to the offices of a number of regional and international organisations with some degree of involvement in chemicals management.

##### ***6.1.1.1 Food and Agriculture Organisation of the United Nations***

The Food and Agriculture Organisation of the United Nations (FAO) is interested in the broad area of pesticides management and chemicals safety as it relates to agriculture and food production. Activities include chemicals inventories, policy analysis and development of legislation, administration of international Conventions, and training and education.

Contact Information: Food and Agriculture Organisation of the United Nations  
P. O. Box 631-C  
Bridgetown, Barbados

##### ***6.1.1.2 Inter-American Institute for Cooperation on 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 ([www.iica.int](http://www.iica.int), 2003).

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 Ministries of Agriculture, Rural Development and Environment. Additionally, IICA conducts distance education courses in Occupational Health and Safety and Organic Farming as part of their objective to promote safe and sustainable agricultural practices.

Contact Information: Inter-American Institute for Cooperation on Agriculture  
P. O. Box 705  
Bridgetown, Barbados

### ***6.1.1.3 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 region. PAHO is also a repository of useful information and guidance on issues related to sound chemicals management, and seeks to facilitate the dissemination of this information to other stakeholders.

Contact Information: Pan American Health Organisation  
P. O. Box 508  
Bridgetown, Barbados

## ***6.1.2 Universities and Research Institutes***

### ***6.1.2.1 Bellairs Research Institute***

The Bellairs Research Institute is an affiliate of McGill University, Quebec, Canada. As such, the Institute hosts visiting lecturers, professors and research students from McGill University, and is able to access some of the resources held at that University. The Research Institute has electronic access to the holdings of the University library, and additionally has its own library where it holds copies of a number of post-graduate research theses in the areas of environmental sciences and ecology, as well as related scientific journals, papers and articles.

Contact Information: Bellairs Research Institute  
Folkstone  
St. James, Barbados

### ***6.1.2.2 University of the West Indies***

Key departments at the Cave Hill Campus of the University of the West Indies with regards to chemicals management are the Department of Biological and Chemical Sciences and the Centre for Resource Management and Environmental Studies (CERMES).

The Department of Biological and Chemical Sciences possesses expertise in the areas of pesticides data collections, analytical techniques such as gas chromatography and mass spectrometry, analysis of chemicals levels in environmental media, and health effects research, particularly in the area of air pollution. The Department also uses chemicals, both organic and inorganic, in their teaching and research laboratories.

CERMES provides training at the post-graduate level for students of Natural Resources Management. Although the Centre is not currently involved in hazardous/toxic chemicals management, staff possess expertise in risk assessment, environmental monitoring (particularly the monitoring of marine water quality) and data collection.

Contact Information: Department of Biological and Chemical Sciences  
Faculty of Pure and Applied Sciences  
University of the West Indies  
Cave Hill  
St. Michael, Barbados

Centre for Resource Management and Environmental Studies  
University of the West Indies  
Cave Hill  
St. Michael, Barbados

### ***6.1.3 Commerce, Trade and Industry***

Chemicals management stakeholders in the fields of commerce, trade and industry include importers, distributors, manufacturers and users of chemicals.

#### ***6.1.3.1 Barbados Light and Power Company Limited***

Barbados Light and Power Co. Ltd. (BL&P) is the national electricity generation and distribution company. They currently have in storage a quantity of used PCB oils and PCB-containing equipment, and are in the process of developing a plan for the environmentally sound disposal of these materials.

Contact Information: Barbados Light and Power Company Ltd.  
The Garrison  
St. Michael, Barbados

#### ***6.1.3.2 Barbados National Oil Company Limited***

The Barbados National Oil Company Ltd. (BNOC) carries out the extraction, importation and exportation of petroleum products. They are responsible for the management of the chemicals associated with these exercises. They also perform some monitoring of environmental media (primarily groundwater) likely to be affected by their activities.

Contact Information: Barbados National Oil Company Ltd.  
Woodbourne  
St. Philip, Barbados

### ***6.1.3.3 Importers of Pesticides and Agricultural Chemicals***

Agro Chemicals Inc. and Carter's General Stores are the major importers and distributors of agricultural chemicals in Barbados.

Contact Information: Agro Chemicals Inc.  
Warrens Industrial Park  
St. Michael, Barbados  
  
Carter's General Stores  
Barbarees Hill  
St. Michael, Barbados

### ***6.1.3.4 McBride Caribbean Limited***

McBride is a manufacturer/reformulator of household chemicals and personal use products, including detergents and insect sprays. McBride carries out regular environmental and occupational health and safety audits of their facilities, in accordance with the policy of their parent company in the United Kingdom.

Contact Information: McBride Caribbean Ltd.  
Lowlands  
Christ Church, Barbados

### ***6.1.3.5 Golf Course Operators***

There are a number of golf courses operating in Barbados. Operators at such facilities are involved in the application of chemicals for the maintenance of the turf on the courses. Golf courses are typically required to carry out some degree of environmental monitoring as required by the national regulatory agencies. Among the leading golf course operators in the island are the Royal Westmoreland Resort and the Sandy Lane Hotel.

Contact Information: Royal Westmoreland Resort  
Westmoreland  
St. James, Barbados  
  
Sandy Lane Hotel  
Sandy Lane  
St. James, Barbados

## ***6.1.4 Environmental/Consumer Groups***

### ***6.1.4.1 Counterpart Caribbean***

Counterpart Caribbean is an environmental non-governmental organisation with a focus on the promotion of sustainable development in Barbados. A volunteer-run organisation, Counterpart Caribbean is actively involved in raising public awareness of sustainable development practices.

Contact Information: Counterpart Caribbean  
Edgehill  
St. Thomas, Barbados

### **6.1.4.2 Caribbean Conservation Association**

The Caribbean Conservation Association (CCA) is a regional organisation, with its Secretariat in Barbados. The CCA has a membership that covers the wider Caribbean and includes participation by non-governmental organisations, government structures and individuals. The mission of the CCA is “to enhance the quality of life for present and future generations of the Caribbean by facilitating the development and implementation of policies, programmes and practices, which contribute to the sustainable management of the region’s natural and cultural resources” (www.ccanet.net, 2003). Specific initiatives related to chemicals management include information management, environmental assessment and monitoring, environmental awareness raising and assisting with compliance with international Conventions.

Contact Information: Caribbean Conservation Association  
Bush Hill  
The Garrison  
St. Michael, Barbados

### **6.1.5 Labour Unions**

The Barbados Workers’ Union (BWU) and the National Union of Public Workers (NUPW) are both concerned with ensuring the occupational safety and health (OSH) of workers in Barbados. In this regard, the unions arrange training sessions for workers and negotiate with management for the implementation of OSH provisions in the workplace. The NUPW also arranges for annual medical examinations for public workers deemed to be at particular risk of exposure to dangerous substances.

Contact Information: Barbados Workers’ Union  
Harmony Hall  
St. Michael, Barbados  
  
National Union of Public Workers  
Dalkeith House  
Dalkeith Road  
St. Michael, Barbados

## **6.2 Summary of Expertise Available Outside of Government**

Table 6.A provides, in summary form, an overview of the expertise in non-governmental organisations which might be available to support national programmes and policies related to chemicals management.

Table 6.A: Summary of Expertise Available Outside of Government

Field of Expertise	Research Institutes and Universities			Trade/Industry						Environmental / Consumer			Labour Unions		Other(Specify)		
	Bellairs Research Institute	Department of Biological and Chemical Sciences (UWI)	Centre for Resource Management and Environmental Studies (UWI)	Barbados Light and Power Co. Ltd.	Barbados National Oil Company Ltd.	Pesticide Importers/Distributors	McBride Caribbean Ltd.	Golf Course Operators	Counterpart Caribbean	Caribbean Conservation Association	Barbados Workers' Union	National Union of Public Workers	Pan American Health Organisation	Inter-American Institute for Cooperation on Agriculture	Food and Agriculture Organisation of the United Nations		
Data Collection	X		X					X		X			X		X		
Testing of Chemicals		X											X				
Risk Assessment			X						X				X				
Risk Reduction																	
Policy Analysis									X				X		X		
Training and Education	X	X	X						X	X	X	X	X	X	X		
Research on Alternatives								X	X	X							
Monitoring	X	X	X		X				X	X	X						
Enforcement																	
Information to Workers				X	X	X	X				X		X				
Information to Public						X		X		X		X			X		

### 6.3 Comments/Analysis

There is present in Barbados a variety of non-governmental stakeholders and interest groups encompassing a range of sectoral interests in chemicals management issues.

It is clear from Table 6.A that the agencies included in this survey house much useful expertise that is brought to bear on the execution of their particular individual mandates as they relate to the sound management of chemicals. 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 non-governmental 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 Barbados 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.

As part of the process of strengthening the national chemicals management infrastructure, attention must also be given to the development and improvement of capacity within non-governmental agencies. Table 6.B indicates that there are a number of gaps or deficiencies in expertise, several of which coincide with similar institutional weaknesses in the public sector (see Table 12.B). Areas where expertise is lacking include testing of chemicals, risk assessment, research on alternatives, risk reduction, and enforcement.



## 7 Inter-ministerial Commissions and Co-ordinating Mechanisms

The intent of this chapter is to describe mechanisms which facilitate co-ordination and co-operation among ministries, agencies and other relevant governmental and non-governmental bodies in particular areas of chemicals management.

### 7.1 Inter-ministerial Commissions and Co-ordinating Mechanisms

Over time several public sector authorities have emerged that have sought to address national development considerations in a manner that draws upon the necessary input of key stakeholders. Those that have some bearing on chemicals management in Barbados include:

- the Pesticides Control Board (PCB),
- the Chemical Substances Technical Working Group (CSTWG),
- the National Ozone Committee,
- Risk Analysis Monitoring Committee on Industrial Development (RAMCID), and
- the National Advisory Committee on Occupational Safety and Health (NACOSH).

Table 7.A provides an overview of the mandate and functioning of these respective committees.

Of the agencies listed in Table 7.A, the CSTWG possesses the most comprehensive and wide-ranging mandate in respect of chemicals management. While the other bodies are concerned with specific aspects of chemicals management, the CSTWG is responsible for the development of a general policy and programme for management of hazardous substances on a national level. However, the Working Group is not a permanent Committee. There are no permanent mechanisms in place with an overarching chemicals management mandate. However, the CSTWG has recommended the creation of a Hazardous Chemicals Control Board, and a supporting secretariat, with responsibility for all matters relevant to the management of all hazardous chemicals, including pesticides.

Table 7.A Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective
<b>Pesticides Control Board</b>	<p>To advise the Minister on matters relevant to the making of regulations under the Pesticides Control Act; and</p> <p>To carry out the provisions under the Act.</p>	Ministry of Agriculture and Rural Development	<ul style="list-style-type: none"> <li>• a Deputy Chief Agricultural Officer assigned by the Minister, to be the Chairman;</li> <li>• the Chief Medical Officer or his nominee;</li> <li>• the Government Analyst; and</li> <li>• two (2) other persons, one of whom may be a public officer.</li> </ul>	Pesticides Control Act

Table 7.A Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective
<b>Chemical Substances Technical Working Group (CSTWG)</b>	To provide guidance on the development of a comprehensive national framework for hazardous substances management.	Environment Unit, Ministry of Housing, Lands and the Environment	<ul style="list-style-type: none"> <li>• Ministry of Housing, Lands and the Environment</li> <li>• Barbados Fire Service</li> <li>• Government Analytical Services</li> <li>• Pesticides Control Board</li> <li>• Environmental Protection Department</li> <li>• Queen Elizabeth Hospital (Poisons Unit)</li> <li>• Central Emergency Relief Organisation (CERO)</li> <li>• Barbados National Standards Institution</li> <li>• Barbados Port Inc.</li> <li>• Royal Barbados Police Force</li> <li>• Customs and Excise Department</li> <li>• Labour Department</li> <li>• National Council for Science &amp; Technology</li> <li>• Barbados Workers' Union</li> <li>• Barbados Manufacturers' Association</li> <li>• University of the West Indies</li> </ul>	Cabinet Authorisation (1993)

Table 7.A Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective
<b>National Ozone Committee</b>	To assist the Ministry of Housing, Lands and the Environment with the execution of the Barbados Country Programme for the phasing out of ozone-depleting substances.	Environment Unit, Ministry of Housing, Lands and the Environment	<ul style="list-style-type: none"> <li>• Environment Unit (Chair and Convener)</li> <li>• National Council for Science and Technology</li> <li>• Environmental Protection Department</li> <li>• Customs and Excise Department</li> <li>• Barbados Statistical Service</li> <li>• Barbados National Standards Institution</li> <li>• Ministry of Labour</li> <li>• Ministry of Finance and Economic Affairs</li> <li>• University of The West Indies</li> <li>• Barbados Industrial Development Corporation</li> <li>• Ministry of Commerce, Consumer Affairs and Business Development</li> <li>• Barbados Manufacturers' Association</li> <li>• Bridgetown Fisheries Complex</li> </ul>	Cabinet Authorisation (October 1994)

Table 7.A Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective
<b>National Advisory Committee on Occupational Safety and Health (NACOSH)</b>	To assist the Factory Inspectorate, Ministry of Labour, with the formulation of national occupational health and safety policy and regulatory frameworks.	Labour Department, Ministry of Labour and Social Security	<ul style="list-style-type: none"> <li>• Ministry of Health</li> <li>• Ministry of Agriculture and Rural Development</li> <li>• Barbados National Standards Institution</li> <li>• Barbados Association of Medical Practitioners</li> <li>• Barbados Association of Professional Engineers</li> <li>• Barbados Workers' Union</li> <li>• Barbados Employers' Confederation</li> <li>• Barbados Manufacturers' Association</li> <li>• Ministry of Labour</li> </ul>	Cabinet Authorisation (1983)

Table 7.A Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	Responsibilities	Secretariat	Members	Legislative Mandate/ Objective
<b>Risk Analysis and Monitoring Committee for Industrial Development (RAMCID)</b>	To advise on and make recommendations concerning risks to environment and workers associated with the use and manufacture of hazardous materials at industrial facilities in Barbados	Director, Barbados National Standards Institution (Chair)	<ul style="list-style-type: none"> <li>• Chief Executive Officer, BIDC</li> <li>• Chief Town Planner</li> <li>• Permanent Secretary, Ministry of Housing and Lands</li> <li>• University of the West Indies</li> <li>• Director, Environmental Protection Department</li> <li>• Chief Labour Officer</li> <li>• Director, National Council for Science and Technology</li> <li>• Barbados Association of Professional Engineers</li> <li>• Senior Medical Officer of Health</li> <li>• Permanent Secretary, Ministry of Industry</li> <li>• General Secretary, Barbados Workers' Union</li> </ul>	Cabinet Authorisation (1982)

## **7.2 Descriptions of Inter-ministerial Commissions and Co-ordinating Mechanisms**

### **7.2.1 Pesticides Control Board**

The Board exists to service the mandate accorded to the Ministry of Agriculture through the Pesticides Control Act. It represents the supporting mechanism for the Minister in making regulations under the Act for managing various aspects of Pesticides management. Regulatory tools may cover the issues of importation, manufacture, labelling, use restrictions and occupational risk, among others.

### **7.2.2 Chemical Substances Technical Working Group**

In 1993 the Cabinet authorised the establishment of a Chemical Substances Technical Working Group (CSTWG) under the Environment Unit. The Working Group was designed to be broad based, and drew from a number of public and private sector offices which are either directly or indirectly involved in some aspect of Hazardous Materials Management. The principal responsibilities assigned to the Working Group were to:

- establish a single national database on hazardous chemical substances;
- devise a notification system for the importation of hazardous substances;
- review and develop appropriate hazardous materials legislation; and
- develop guidelines for handling, storage, disposal and correct use of hazardous substances.

Significant outputs of the CSTWG to-date include:

- Hazardous Chemicals/Substances Survey and Inventory 1995-1998;
- National Hazardous Materials Emergency Response Plan (1999); and
- Recommendations for a revised Administrative Framework for the Management of Hazardous Substances.

The Committee is now finalising the preparation of a National Hazardous Substances Management Policy Paper which will ultimately be used to inform the preparation of comprehensive national legislation in this area.

### **7.2.3 National Ozone Committee**

Barbados signed the Vienna Convention and its associated Montreal Protocol on Substances that deplete the Ozone Layer in 1987. The subsequent development of the Barbados Country Programme and the formation of the National Ozone Committee were primarily to effect compliance with the requirements of the protocol. The use of Ozone-Depleting Substances (ODS's) in the refrigeration and air-conditioning sectors is the primary area of national concern. Barbados imports all of its ODS's. Functioning of the Committee is largely related to the formulation of strategic policies to give effect to realising the phase-out targets defined in the Country Programme. Strategies offered to date include:

- a licensing and certification programme for persons in the refrigeration industry, inclusive of training in chlorofluorocarbon (CFC) recovery and recycling;
- fiscal incentives to promote the transition towards the employ of ozone friendly refrigerants;

- supporting mechanisms to facilitate the reclamation and recycling of CFC's as a means of reducing annual ODS imports; and
- the promotion of greater collaborative efforts with the various sectors involved in the use of ODS's.

#### **7.2.4 National Advisory Committee on Occupational Safety and Health**

The Terms of Reference for the National Advisory Committee on Occupation Safety and Health (NACOSH) are as follows -:

- to make recommendations on matters referred to it by the Minister, submitted to it by interested parties, or pursued by the Committee on its own initiative;
- to advise the Minister on programmes in the field of occupational safety, health and hygiene;
- to advise the Minister on policies and procedures in standard setting and in the development and review of regulations and guidelines to be used by the Government;
- to review and make recommendations to the Minister on the introduction of new processes or substances in the workplace;
- to review and make recommendations in regards to the safety, health and welfare arrangements for specific occupational groups and in areas where there are no formal health and safety programmes, or where such programmes are judged to be inadequate; and
- to liaise with other relevant agencies and coordinate all activities pertaining to occupational health and safety.

Since its establishment in 1983, NACOSH has been affected by several periods of inactivity. However, in 1993-1994 the Committee played a key role in the revision of the proposed Draft Health and Safety at Work Bill. This Bill, which has been revised as a comprehensive Occupational Health and Safety Bill, is yet to be enacted. Upon enactment, it is intended to serve as a replacement for the Factories Act.

#### **7.2.5 Risk Analysis and Monitoring Committee for Industrial Development**

The Risk Analysis and Monitoring Committee for Industrial Development (RAMCID) is a 13-member Committee, the formation of which was approved by Cabinet in 1982. The Committee is chaired by the Director of the Barbados National Standards Institution, and its membership comprises representatives from Governmental offices, academia and the private sector.

The functions of the Committee are:

- to advise on the particular risk to the environment and workers involved in the setting up in Barbados of industries using or manufacturing hazardous materials and industries where Quality Control is of the utmost importance;
- to advise on the possible location of such plants with consideration given to the compatibility with the already existing industries and the general environment;
- to recommend the monitoring of the use and disposal of hazardous materials of such industries, and the risks involved in the industries;
- to assist the Barbados Investment and Development Corporation in developing a rational policy for development of industries which produce and use hazardous products in Barbados;
- to co-ordinate the functions of organisations already involved in the approval of new industries in Barbados.

RAMCID has been inactive for an extended period of time.

## **7.3 Description of Mechanisms for Obtaining input from Non-Governmental Bodies**

In recent years Government has generally sought to secure wide ranging input into its decision making processes. In a practical sense this has proceeded in either an ad-hoc manner or via structured mechanisms.

### ***7.3.1 Ad-Hoc Mechanisms***

These generally involve reports to parent Ministries of complaints relating to a specific situation of concern either at the individual or community level. Wider issues of international and potentially national import are also reported, though moreso through institutional linkages.

### ***7.3.2 Structured Mechanisms***

These generally originate from the various standing committees and boards which have been established, and involve the invitation of input from other individuals or organisations as co-opted members.



## 8 Data Access and Use

This chapter is intended to provide an overview of the availability of data for chemicals management in Barbados. It is also intended to analyse 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 ways, 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 types of data listed.

During the process of researching this chapter it became clear from the incipient stage that there are acute difficulties to be faced in attempts to obtain data on chemicals management in Barbados. This finding should not be interpreted to mean that there is no data; there is data, but a number of factors contribute to prohibiting access to and effective use of this data.

One of these factors is the format in which the data is stored. It is observed that data is collected in a form which meets the specific requirements of the collection agency; this form may not be convenient for use for other purposes or by persons external to the organisation.

Additionally, the type of data collected is also specific to the collecting agency. Because there are a variety of agencies collecting such data for their own mandated purposes, it can be difficult to piece information together to get a holistic picture of the chemicals management situation in Barbados.

It should be noted that in the absence of a legislative requirement governing data collection, its collection appears to be incidental to other matters. This also affects the quality and availability of data held by regulatory agencies.

From the information presented in Table 8.A, one may conclude that there is a deficiency in both the quality and quantity of data on toxic chemicals, with the exception of pesticides.

**Table 8.A: Availability of Chemicals Management Data**

<b>Data Needed For</b>	<b>Pesticides (agricultural, public health and consumer use)</b>	<b>Industrial Chemicals</b>	<b>Consumer Chemicals</b>	<b>Chemical Wastes</b>
<b>Priority Setting</b>	Ministry of Housing, Lands and the Environment	n/a <sup>1</sup>	n/a	n/a
<b>Assessing Chemicals Impact under Local Conditions</b>	Pesticides Control Board (PCB)	n/a	n/a	n/a
<b>Risk Assessment (environment/health)</b>	PCB	n/a	n/a	n/a
<b>Classification/ Labelling</b>	PCB Barbados National Standards Institution (BNSI)	n/a	n/a	n/a
<b>Barbados National Standards Institution (BNSI)</b>	n/a	n/a	n/a	n/a
<b>Registration</b>	PCB	n/a	n/a	n/a
<b>Licensing</b>	PCB	n/a	n/a	n/a
<b>Permitting</b>	PCB	n/a	n/a	n/a
<b>Risk Reduction Decisions</b>	PCB	n/a	n/a	n/a
<b>Accident Preparedness and Response</b>	Barbados Fire Service (BFS) Central Emergency Relief Organisation (CERO) Environmental Protection Department (EPD)	BFS CERO EPD	BFS CERO EPD	BFS CERO EPD
<b>Poisoning Control</b>	n/a	n/a	n/a	n/a
<b>Emissions Inventories</b>	n/a	n/a	n/a	n/a
<b>Inspections &amp; Audits (Environmental and/or Occupational Health and Safety)</b>	EPD Labour Department	EPD Labour Dep't	EPD Labour Dep't	EPD Labour Dep't

**Table 8.A: Availability of Chemicals Management Data**

Data Needed For	Pesticides (agricultural, public health and consumer use)	Industrial Chemicals	Consumer Chemicals	Chemical Wastes
<b>Information to workers</b>	Workers Union Labour Department Ministry of Agriculture and Rural Development (MARD) Ministry of Housing, Lands and the Environment	Workers Union Labour Dep't	Workers Union Labour Dep't	Workers Union Labour Dep't
<b>Information to the Public</b>	Distributors	n/a	n/a	n/a

<sup>1</sup> n/a: Information not available

## 8.2 Location of National Data

Table 8.B indicates the location and accessibility of national data related to chemicals and chemicals management.

The Barbados Statistical Service (BSS) remains the primary repository of data on chemicals production and trade. Outside of this department, there are smatterings of data to be found elsewhere, as indicated in Table 8.B.

The Pesticides Control Board (PCB), chaired by the Ministry of Agriculture and Rural Development, 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.

In respect of other groups of chemicals, which do not fall under the ambit of responsibility of the Pesticides Control Board, difficulty may be encountered in determining which agency has responsibility for gathering and collating specific types of data. Oftentimes there is no clear indicator as to which agency holds the data required. Also, as previously mentioned, data may be stored in a manner that makes retrieval cumbersome and time-consuming.

**Table 8.B: Location of National Data**

Type of Data	Location(s)	Data Source	Who has Access?	How to gain access?	Format
<b>Production Statistics</b>	Manufacturers/ Producers	Company Records	Government	Write	Paper
<b>Import Statistics</b>	BSS  Importers	Customs Department Company Records	Members of the Public n/a <sup>1</sup>	Request & Visit  n/a	Database  n/a
<b>Export Statistics</b>	BSS		Customs Department	Members of the Public	Request & Visit
<b>Chemical Distribution and Use Statistics</b>	Distributors	Company Records	n/a	n/a	n/a
<b>Industrial Accident Reports</b>	Workers Union & Labour Dep't	Employers	Unions, Inspectors & Members of the Public	Request & Visit	Paper Files & Reports
<b>Occupational Health Data (agricultural)</b>	Workers Union & Labour Dep't	Employers	Restricted <sup>2</sup>	Request to the Chief Labour Officer	Paper Files & Reports
<b>Occupational Health Data (industrial)</b>	Labour Dep't	Employers	Restricted	Request to the Chief Labour officer	Paper Files & Reports
<b>Poisoning Statistics</b>	Queen Elizabeth Hospital	Public	Members of the public	Request to the Hospital Director	Database at Emergency Room
<b>Pollutant Release and Transfer Register</b>	n/a	n/a	n/a	n/a	n/a
<b>Hazardous Waste Data</b>	EPD	Company	Members of the public	Request to the Director	Paper Files
<b>Register of Pesticides</b>	Ministry of Agriculture (PCB)	Manufacturers and/or Distributors	Members of the public	Request and Visit	Database

**Table 8.B: Location of National Data**

Type of Data	Location(s)	Data Source	Who has Access?	How to gain access?	Format
<b>Register of Toxic Chemicals</b>	n/a	n/a	n/a	n/a	n/a
<b>Inventory of Existing Chemicals</b>	n/a	n/a	n/a	n/a	n/a
<b>Register of Imports</b>	Barbados Statistical Service and Customs Dep't	Customs Department	Members of the public	Request & Visit	Database
<b>Register of Producers</b>	n/a	n/a	n/a	n/a	n/a
<b>PIC Decisions</b>	PCB	Rotterdam Secretariat	Members of the public	Request to the Chair of the PCB	Hard Copy Digital format

<sup>1</sup> n/a: Information not available at the time of compilation of the Profile.

<sup>2</sup> Data can be accessed only by authorised personnel of the Labour Department, and in the case of an occupational incident, by the affected employee and his/her designated representatives

### 8.3 Procedures for Collecting and Disseminating National/Local Data

Under the Pesticides Control Act, persons wishing to import pesticides into Barbados are required to provide core data to the Pesticides Control Board; this data relates to toxicity, environmental data, target organisms, efficacy etc. The Board may also require any further information that they deem necessary to make a decision on the registration of a chemical.

For chemicals other than those agro-chemicals regulated by the Pesticides Control Board, there is an absence of coordinated national programmes and procedures for data collection.

Although there are few programmes explicitly targeted towards disseminating information to the public, by and large the Barbadian public has unencumbered access to data. There are some exceptions to this: for example, under legislation governing the operations of the Barbados Statistical service access to certain data is prohibited.

### 8.4 Availability of International Literature & Databases

Barbados is fortunate in that a number of regional and international institutions are located in the country (refer to Chapter 6 for further information), which allow access to international literature, databases and other informational resources that they hold. Table 8.C outlines the nature of the international literature on chemicals management available, identifies their locations and means of gaining access.

**Table 8.C: Availability of International Literature**

Literature	Location(s)	Who has access?	How to gain access
<b>Environmental Health Criteria Documents (WHO)</b>	PAHO Library	Public	By appointment
<b>Health and Safety Guides (WHO)</b>	PAHO Library	Public	By appointment
<b>International Chemical Safety Data Cards (IPCS/EC)</b>	Ministry of Labour	Public	By appointment
<b>Decision Guidance Documents for PIC Chemicals (FAO/UNEP)</b>	PAHO Library FAO Library	Public	By appointment
<b>FAO/WHO Pesticides Safety Data Sheets</b>	PAHO Library FAO Library	Public	By appointment
<b>Documents from the FAO/WHO Joint Meeting on Pesticide Residues</b>	PAHO Library FAO Library	Public	By appointment
<b>Materials Safety Data Sheets (industry)</b>	Labour Department Individual Industrial Companies Suppliers (Local & International)	Public	By appointment
<b>OECD Guidelines for the Testing of Chemicals</b>	PAHO Library	Public	By appointment
<b>Good Laboratory Practice Principles</b>	Government Analytical Services BNSI	Government departments	By appointment
<b>International Organisation for Standardisation (ISO)</b>	BNSI	Public	Visit

## 8.5 National Information Exchange System

There is scope for improvements to the current arrangements for managing information exchange and flow (i) from international agencies to concerned parties within the country and (ii) among 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 incorrect agency or contact person. Significant delays can be experienced before the information is received by the agency best able to make use of it.

Situations such as these would benefit greatly from the establishment of a formal structure for the delivery and exchange of information to and between national institutions.

## 8.6 Comments/Analysis

It is clear that there exist a number of shortcomings with regard to the availability of data for chemicals management in Barbados. However they are a number of potentially useful sources of data. Because of the scattered data sources and the diversity of data formats, it is difficult to assess the extent and adequacy of coverage of existing data.

A formal structure to oversee and co-ordinate the collection, storage and publication of chemicals management data needs to be established. Gaps and deficiencies in existing databases should be identified and programmes devised to collect or generate the deficient information.

The most glaring deficiency in data availability is apparent from Table 8.A. There exists a severe dearth of data about industrial and consumer chemicals and hazardous waste. These deficiencies need to be addressed. There is also a lack of information about the types and quantities of hazardous waste generated nationally, the release of pollutants and the levels of pollutants in the environment. Systems ought to be devised for the ongoing collection and analysis of such data. Further to this, steps should be taken to ensure that data gathered is put to effective and appropriate use as aids to enforcement action, decision-making and the formulation of policy.

Contact points/persons must be identified in each agency that deals with chemicals management in Barbados, and the specific chemicals management responsibilities of each agency identified. This would allow for the exchange and dissemination of data to be directed to the appropriate focal points in a timely manner.

Such improvements would have considerable positive impacts on the quality and quantity of data available to regulators and other stakeholders, and would facilitate better-informed and more effective decision-making regarding chemicals management.



## 9 Technical Infrastructure

This chapter provides an overview of the technical infrastructure in Barbados that could be made available to support a comprehensive chemicals management programme.

### 9.1 Overview of Laboratory Infrastructure

Barbados has three laboratories capable of providing the chemical analyses required to support the implementation of a chemicals management programme for the island. These laboratories are:

- Government Analytical Services (GAS), of the Ministry of Agriculture and Rural Development (MARD)
- The Forensic Sciences Centre (FSC), of the Office of the Attorney-General (AGO)
- The Department of Biological and Chemical Sciences, University of the West Indies (UWI), Cave Hill Campus.

These laboratories were all designed with different purposes in mind and to analyse different types of samples. This has resulted in the development of different skill-sets among the scientists at each facility. These skills include:

- Assessing the quality of chemicals;
- Residue analysis;
- Identification of unknown samples; and
- The monitoring of adverse health effects from chemical use.

The analytical capabilities and activities of these facilities are outlined in Table 9.A.

Great organisational effort would be required for the effective coordination of these various competencies. The development within a single office of all the skills required for such a programme would simplify the coordination process. It is noted that, of the three laboratories identified, the GAS has had extensive experience in environmental monitoring, as part of projects and routine programmes carried out in conjunction with agencies such as the Barbados Water Authority (BWA), Environmental Protection Department (EPD) and Coastal Zone Management Unit (CZMU). Such projects would typically involve the type of analyses that would be associated with chemicals management. Consequently, of the three laboratories, the GAS is the one with the expertise and experience most suited to participation in chemicals management.

Both of the Government-operated institutions have undertaken to improve the quality of the analyses that they perform. The GAS and the FSC have recognised the need for their results to stand up to international scrutiny and have taken the initiative to individually and independently attain accreditation. In addition, GAS is participating in proficiency testing schemes as a means of assessing, and ultimately improving, its technical ability and quality control procedures.

Table 9.A: Overview of Laboratory Infrastructure for Regulatory Chemical Analysis

Name, Address & Description of Laboratory	Equipment/Analytical capabilities available	Accredited (if yes by whom)	Certified GLP <sup>1</sup> (yes/no)	Purpose/Activities
<p><b>Government Analytical Services</b></p> <p>Culloden Road St. Michael Barbados</p> <p><b>Description</b></p> <p>An analytical laboratory specialising in both chemical and microbiological analysis of food, water, soil and plant tissue.</p>	<ul style="list-style-type: none"> <li>Gas Chromatograph with Mass Selective Detector (GC-MS)</li> <li>Gas Chromatograph with Flame Ionisation Detector and Flame Photometric Detector (GC-FID/FPD)</li> <li>Gas Chromatograph with Nitrogen Phosphorus Detector and Electron Capture Detector (GC-NPD/ECD)</li> <li>High Pressure Liquid Chromatograph with Multi Wavelength Detection, Fluorescence and Refractive index (HPLC-MWD)</li> <li>Dionex (Ion Chromatograph)</li> <li>Pulse Auto analyzer</li> <li>UV-Visible spectrometer</li> <li>Atomic absorption spectroscopy – Flame and Graphite Furnace</li> <li>Fourier Transform Infrared Spectrometer (FT-IR)</li> </ul>	NO	NO	<ul style="list-style-type: none"> <li>Conducts several monitoring programs of environmental significance for agencies such as the Environmental Protection Department, the Barbados Water Authority and the Coastal Zone Management Unit.</li> <li>Monitors imports for the Customs Department.</li> <li>Determines constituent levels for exporting manufacturing companies.</li> <li>Analyses samples for the general public.</li> <li>Utilises United States Environmental Protection Agency, Environment Canada, and United States Food and Drug Administration analytical methods.</li> </ul>

**Table 9.A: Overview of laboratory Infrastructure for Regulatory Chemical Analysis**

Name, Address & Description of Laboratory	Equipment/Analytical capabilities available	Accredited (if yes by whom)	Certified GLP <sup>1</sup> (yes/no)	Purpose/Activities
<p><b>Forensic Science Centre</b></p> <p>Culloden Road St. Michael Barbados</p> <p><b>Description</b></p> <p>An analytical laboratory specialising in the chemical, microbiological, toxicological analysis of samples submitted by the Royal Barbados Police Force and other police forces across the Caribbean region.</p>	<ul style="list-style-type: none"> <li>• GC-MS</li> <li>• GC-FID/FPD</li> <li>• High Pressure Liquid Chromatograph – Diode Array Detector (HPLC-DAD)</li> <li>• HPLC-MS (on order)</li> <li>• FT-IR</li> <li>• Scanning UV-Visible spectrometer</li> <li>• Inductively Coupled Plasma Spectrometer (ICP) (on order)</li> <li>• Polymerase Chain Reaction (PCR) machine</li> <li>• Ultra-centrifuge</li> <li>• FMBIO DNA Gel Scanning Instrument</li> <li>• ABI prism (on order)</li> <li>• Electrophoresis</li> </ul>	NO	NO	<p>The Forensic Science Centre will be a fully equipped laboratory; their focus will be on crime-related matters in Barbados and the Caribbean region.</p>

Table 9.A: Overview of laboratory Infrastructure for Regulatory Chemical Analysis

Name, Address & Description of Laboratory	Equipment/Analytical capabilities available	Accredited (if yes by whom)	Certified GLP <sup>1</sup> (yes/no)	Purpose/Activities
<p><b>Barbados National Standards Institution</b></p> <p>“Flodden” Culloden Road St. Michael Barbados</p> <p><b>Description</b> An analytical laboratory specialising in both chemical and microbiological analysis of food, water and milk.</p>	<ul style="list-style-type: none"> <li>• UV-Visible spectrometer</li> <li>• Gas chromatograph</li> <li>• Flame photometer</li> <li>• Laminar Flow equipment</li> </ul>	NO	NO	<p>Responsible for the formulation, adoption and maintenance of national standards.</p> <p>National contact point for Codex Alimentarius.</p> <p>Carries out tests to ensure imports/exports and consumer foods conform to national standard requirements.</p>

Table 9.A: Overview of laboratory Infrastructure for Regulatory Chemical Analysis

Name, Address & Description of Laboratory	Equipment/Analytical capabilities available	Accredited (if yes by whom)	Certified GLP <sup>1</sup> (yes/no)	Purpose/Activities
<b>University of the West Indies Department of Biological and Chemical Sciences</b>  Cave Hill St. Michael Barbados	<ul style="list-style-type: none"> <li>• Nuclear Magnetic Resonance (NMR)</li> <li>• GC-MS</li> <li>• Gas Chromatograph</li> <li>• HPLC</li> <li>• UV-Visible spectrometer</li> <li>• Atomic absorption spectroscopy</li> <li>• Fourier Transform Infrared Spectrometer</li> <li>• Infra-red gas analyzer</li> <li>• Ethylene gas analyzer</li> <li>• PCR machine</li> <li>• Polarimeter</li> <li>• Magnetobalances</li> <li>• Ultra-centrifuge</li> </ul>	NO	NO	The University of the West Indies is a teaching and research institution.

<sup>1</sup> GLP: Good Laboratory Practice

## **9.2 Overview of Government Information Systems/Computer Capabilities**

Over the years, the number of computer systems in both Government offices and non-governmental institutions in Barbados has increased. The compatibility of the systems housed in different departments is unknown at this time.

Table 9.B outlines the major computer capabilities that could potentially be used in activities related to chemicals management. Such activities may include the development of chemicals information systems, databases and inventories, accessing international information databases, and otherwise lending support to Government's policies and programmes related to the sound management of chemicals.

Table 9.B: Computer Capabilities

Computer system/Database	Location	Equipment available	Current uses
<b>Server</b>	<b>Government Analytical Services</b> Culloden Road St. Michael	<ul style="list-style-type: none"> <li>• Servers: 2 SQL</li> <li>• Exchange</li> <li>• File &amp; print services</li> <li>• Laboratory Information Management System (LIMS)</li> <li>• Intranet</li> <li>• Internet access</li> <li>• Personal Computers: 20 systems networked</li> </ul>	<ul style="list-style-type: none"> <li>• Data processing, storage, and reporting</li> <li>• Information gathering</li> <li>• At least one system in a section is internet capable</li> <li>• Instrument interface</li> </ul>
<b>Server</b>	<b>Forensic Science Center</b> Culloden Road St. Michael	<ul style="list-style-type: none"> <li>• Servers: 2 SQL</li> <li>• Exchange</li> <li>• File &amp; print services</li> <li>• LIMS</li> <li>• Intranet</li> <li>• Internet access</li> <li>• Personal Computers: 43 systems networked</li> </ul>	<ul style="list-style-type: none"> <li>• Data processing, storage, and reporting</li> <li>• Information gathering</li> <li>• At least one system in a section is internet capable</li> <li>• Instrument interface</li> </ul>

Table 9.B: Computer Capabilities

Computer system/Database	Location	Equipment available	Current uses
<b>Server</b>	<b>University of the West Indies Department of Biological and Chemical Sciences</b> Cave Hill St. Michael	<ul style="list-style-type: none"> <li>• Campus wide network</li> <li>• File and print services</li> <li>• Internet</li> <li>• Website</li> </ul>	<ul style="list-style-type: none"> <li>• Research</li> <li>• E-mail</li> <li>• Sourcing of spare parts and equipment</li> </ul>
<b>Databases</b>	<b>Coastal Zone Management Unit</b> Bay Street St. Michael	<ul style="list-style-type: none"> <li>• Server: 1 SQL</li> <li>• Geographic Information System (GIS)</li> <li>• Global Positioning System (GPS)</li> <li>• Relational database of planning applications</li> </ul>	<ul style="list-style-type: none"> <li>• Georeferencing</li> <li>• Maps &amp; planning</li> <li>• Spatial querying</li> <li>• Reef data</li> <li>• Water quality data</li> </ul>
<b>Databases</b>	<b>Barbados Statistical Service</b> Fairchild Street Bridgetown St. Michael	<ul style="list-style-type: none"> <li>• Server: 1 SQL</li> <li>• File and print services</li> <li>• Internet access (1 system)</li> <li>• PCs: 44 systems networked</li> </ul>	<ul style="list-style-type: none"> <li>• Gathering and collation of data on imports and exports</li> </ul>

Table 9. B: Computer Capabilities

Computer system/Database	Location	Equipment available	Current uses
<p><b>Databases</b></p>	<p><b>Customs Department</b>            Port Authority Building            University Row            Bridgetown            St. Michael</p>	<ul style="list-style-type: none"> <li>• Servers: 10</li> <li>• Wide area network using fixed-frame related connections: 150 PCs</li> <li>• Corporate vibrat scanners</li> <li>• Internet access</li> </ul>	<ul style="list-style-type: none"> <li>• Information gathering on imports and exports</li> </ul>

### **9.3 Overview of Technical Training and Education Programmes**

Technical training in Government-operated analytical facilities has consisted primarily of in-house training and training from suppliers of new instruments and equipment. In addition, Government departments have formulated and implemented their own internal skills development programmes. Opportunities for professional development may also become available through the capacity building components of regional and international technical assistance and co-operation initiatives.

There are two tertiary institutions in Barbados, the Barbados Community College (BCC) and the University of the West Indies (UWI) that offer courses in subjects relevant to chemicals management.

### **9.4 Comments/Analysis**

In Barbados, the analytical capabilities in Governmental laboratories of the various Ministries were developed relatively independently as the need arose. The development of a programme to comprehensively manage chemicals on the island through collaborative inter-sectoral methods is an approach that will require investments of time, finance and manpower to achieve the associated goals.

The current technical infrastructure is inadequate to fully support such a programme. However, if the programme requirements are clearly defined, so that the resources and requirements of each department can be identified, the infrastructure can be modified and built upon to support these requirements.

The main weaknesses in the existing infrastructure can be categorised under the following headings:

- Equipment
- Staffing
- Training

#### **9.4.1 Equipment**

The lack of necessary equipment is still one of the greatest limitations constraining analytical facilities in Barbados. Although most of the equipment that will be required is available, there are a number of instruments still required to perform, for instance, analysis of volatile organics or temperature-sensitive compounds. The costs of both equipment and the strict maintenance schedules necessary for accreditation can be prohibitively high for individual institutions; serious consideration should be given to greater collaboration in respect of purchase of equipment and sharing of equipment, as a means of reducing overall operating expenses.

#### **9.4.2 Staffing**

Staffing is another requirement for a proper chemicals management program. The current complement of personnel with the required knowledge and expertise is small. A consequence of undertaking routine analysis of the sort likely to be associated with a chemicals management programme will be an increased workload on the already limited manpower.

The development of specialisations among technical staff is another consideration. An improvement in the timeliness and quality of data produced will be observed when scientists have the opportunity to specialise in an area. It is difficult to achieve this if a technician or scientist's attention is divided over several areas. An increase in staff will allow for specialisation to take place.

### **9.4.3 Training**

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 will assist in skills development and capacity building.

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; and
- 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, as 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 Barbados would also benefit greatly from the harmonisation of laboratory facilities, their functions and capabilities. For a number of years there has been a working group examining the issue of rationalisation of laboratory facilities, but no final proposals have arisen from the working groups discussions. Great benefits could be obtained from the development of a national policy to improve the quality and quantity of laboratories and technical facilities in general.



## 10 International Linkages

This chapter identifies those chemicals management stakeholders in Barbados, 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 Barbadian chemicals management infrastructure.

### 10.1 Co-operation and Involvement with International Organisations, Bodies and Agreements

A number of organisations and agencies in Barbados have connections to regional and international bodies which are concerned with various aspects of the sound management of chemicals. Table 10.A outlines these connections and describes the local activities that are facilitated by involvement with these external agencies. Although not all of the agencies listed have chemicals management initiatives currently ongoing, they may still be able to provide resources that would facilitate and inform the establishment of a national management programme.

**Table 10.A: Cooperation/Affiliation with International Organisations, Programmes and Bodies**

International Organisation/ Body/Activity	National Focal Point (Ministry/Agency and Primary Contact Point)	Other Ministries and/or Agencies Involved	Related National Activities
<b>United Nations Environment Programme</b>	Permanent Secretary (Environment), Ministry of Housing, Lands and the Environment	<ul style="list-style-type: none"> <li>Ministry of Foreign Affairs</li> </ul>	Implementation of the Decisions of the UNEP Governing Council
<b>World Health Organisation</b>	Pan American Health Organisation	<ul style="list-style-type: none"> <li>Ministry of Housing, Lands and the Environment</li> <li>Ministry of Health</li> </ul>	
<b>International Programme on Chemical Safety</b>	Pan American Health Organisation		

**Table 10.A: Cooperation/Affiliation with International Organisations, Programmes and Bodies**

<b>International Organisation/ Body/Activity</b>	<b>National Focal Point (Ministry/Agency and Primary Contact Point)</b>	<b>Other Ministries and/or Agencies Involved</b>	<b>Related National Activities</b>
<b>Food and Agriculture Organisation of the United Nations</b>	Food and Agriculture Organisation of the United Nations	<ul style="list-style-type: none"> <li>• Inter-American Institute for Cooperation on Agriculture</li> <li>• Ministry of Agriculture and Rural Development</li> </ul>	
<b>International Labour Organisation</b>	Labour Department, Ministry of Labour and Social Security	<ul style="list-style-type: none"> <li>• National Union of Public Workers</li> <li>• Barbados Workers' Union</li> </ul>	
<b>International Confederation of Free Trade Unions</b>		<ul style="list-style-type: none"> <li>• Barbados Workers' Union</li> <li>• National Union of Public Workers</li> </ul>	
<b>Trades Union Congress (UK)</b>		<ul style="list-style-type: none"> <li>• National Union of Public Workers</li> </ul>	
<b>Economic Commission for Latin America and the Caribbean</b>	Ministry of Foreign Affairs		
<b>International Organisation for Standardisation</b>	Barbados National Standards Institution, Ministry of Commerce, Consumer Affairs and Business Development		
<b>International Maritime Organisation</b>	International Transport Division, Ministry of Tourism and International Transport	<ul style="list-style-type: none"> <li>• Coastal Zone Management Unit, Ministry of Housing, Lands and the Environment</li> <li>• Barbados Coast Guard</li> <li>• Barbados Port Inc.</li> </ul>	Implementation of international maritime Conventions ratified by Barbados

**Table 10.A: Cooperation/Affiliation with International Organisations, Programmes and Bodies**

<b>International Organisation/ Body/Activity</b>	<b>National Focal Point (Ministry/Agency and Primary Contact Point)</b>	<b>Other Ministries and/or Agencies Involved</b>	<b>Related National Activities</b>
<b>Inter-American Development Bank</b>	Ministry of Health	<ul style="list-style-type: none"> <li>National Union of Public Workers</li> </ul>	Development of an Integrated Solid Waste Management Plan, including a component for addressing hazardous waste.
<b>Inter-American Drug Abuse Control Commission (CICAD)</b>	National Council for Substance Abuse, Ministry of Home Affairs	<ul style="list-style-type: none"> <li>Ministry of Housing, Lands and the Environment</li> <li>Ministry of Health</li> </ul>	Provision of information and technical assistance on chemicals precursors and pharmaceutical products, and on the regulation of chemicals used in the illicit production of narcotic drugs and psychotropic substances.

Table 10.B outlines Barbados's involvement in international agreements and procedures related to chemicals management, and identifies those agencies which bear primary responsibility for the administration and implementation of these agreements and procedures.

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

<b>International Agreements</b>	<b>Primary Responsible Agency</b>	<b>Relevant National Implementation Activities</b>
<b>Agenda 21 – Commission for Sustainable Development</b>	Environment Unit, Ministry of Housing, Lands and the Environment	Preparation of Annual Reports to the Commission for Sustainable Development
<b>Montreal Protocol</b>	Environment Unit, Ministry of Housing, Lands and the Environment	
<b>ILO Convention 170</b>	Labour Department, Ministry of Labour and Social Security	
<b>Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal</b>	Environmental Protection Department, Ministry of Housing, Lands and the Environment	
<b>London Convention</b>	International Transport Division, Ministry of Tourism and International Transport	Monitoring waste disposal, grant of licences by the Environmental Protection Department for dumping of approved wastes at sea
<b>International Maritime Dangerous Goods (IMDG) Code</b>	Barbados Port Inc. International Transport Division, Ministry of Tourism and International Transport	Safe transport, handling, packaging, labelling, storage and segregation of dangerous goods in port areas with appropriate emergency response action plans in accordance with the IMDG Code  Submission of annual reports to the IMO
<b>Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade</b>	Ministry of Agriculture and Rural Development  Environmental Protection Department, Ministry of Housing, Lands and the Environment	
<b>Stockholm Convention on Persistent Organic Pollutants</b>	Environmental Protection Department, Ministry of Housing, Lands and the Environment	Development of a National Implementation Plan for the Management of Persistent Organic Pollutants

## 10.2 Comments/Analysis

Tables 10.A and 10.B indicate that there are several relevant and potentially useful linkages between agencies in Barbados and international organisations, programmes and bodies concerned with chemicals management. Such linkages offer opportunities for Barbadian agencies to benefit from information sharing and exchange, technical advice, training and other forms of technical and financial assistance.

It must be taken into account, however, that chemicals management is not necessarily defined as a priority in the programmes of international bodies operating in conjunction with Barbadian agencies; neither is it necessarily 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 Barbados – in some instance 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, and there are few inter-departmental/inter-ministerial mechanisms to co-ordinate activities initiated by these international bodies or agreements. As a result, although a number of related projects may be on-going within the island, these projects may not be effectively integrated into a comprehensive national programme for chemicals management.

It is anticipated that current proposals for the development of a comprehensive framework for the management of hazardous substances, and the formation of a working group responsible for the management of said framework, will serve to improve the level of co-ordination and collaboration between agencies with regard to the implementation of international activities, programmes and agreements.



# 11 Awareness/Understanding of Workers and the Public

This chapter aims to provide an overview of the mechanisms available to provide information to workers and to the public concerning potential risks associated with chemical production, import, export, handling, use and disposal.

## 11.1 Legal Instruments

The main legal instrument pertaining to the monitoring and regulation of chemicals in Barbados is the Pesticides Control Act. The main provisions for information to be provided to workers and the public under this Act are made through requirements for labelling of pesticides.

Under the Labelling of Pesticides Regulations, 1976, every container in which a pesticide is distributed or exposed or offered for sale should have affixed to it a label, approved by the Pesticides Control Board, clearly setting forth, in the English language:

- The trade and proprietary name of the pesticide;
- The name and address of the distributor or manufacturer;
- The common name of the active ingredient and its percentage content; and
- The net contents by weight or volume of the container.

Additionally, under the Pesticides Control Regulations, 1974, each package of a pesticide sold or distributed shall be accompanied by a copy of the conditions regarding its use, as laid down by the Pesticides Control Board.

The Pesticides Control Act also includes provisions imposing a duty of care on employers, workers and others to reduce the risk of harm to workers as a result of working with pesticides. Safety measures outlined in the Pesticides Control Act include:

- The provision and maintenance in good order of protective clothing and equipment;
- The use of devices by employers to warn against poisoning by pesticides, to ensure proper use of protective equipment and facilities, and to warn against eating, drinking or smoking where there may be a risk of pesticides poisoning or explosion;
- Prescribing for workers limits to periods of exposure and the length of the intervals between periods of exposure to risks related to pesticide poisoning;
- Provision of instruction and training in the use of equipment, apparatus and facilities; and
- Prescribing measures for investigation and detecting cases in which workers may have been victims of pesticide poisoning.

The Factories Act also places requirements on employers to ensure a safe working environment for all employees, but does not make explicit reference to providing information about safe chemicals management.

## 11.2 Public/Worker Awareness Programmes and Policies

There are few national programmes specifically aimed at addressing the lack of awareness and understanding by the public of issues related to the use, disposal and overall management of hazardous chemicals. One of these few is an initiative carried out by the Sewerage and Solid Waste Project Unit of the Ministry of Health, which seeks to inform the public about hazardous waste management as part of the Integrated Solid Waste Management Plan.

Stakeholder input at the National Consultation on Chemicals Management revealed that there is a clear need for additional programmes to be put in place and, where they are in place, to be expanded. The programmes should seek to inform not only those persons who are likely to have direct contact with these chemical agents, but also the general public. There is a need to move away from the “need to know” approach to an approach that seeks to sensitise the general public on the sound management of chemicals and hazardous substances.

In this regard, it is important that the farming community be targeted, particularly in view of the fact that farmers often have access to chemicals and have received very little training in the appropriate use of these chemicals. Training and sensitisation in the use of these chemicals could be done through the relevant farmers’ organisations, where they exist.

In addition, the fact that new household chemicals and toxic products are being sourced and imported daily suggests that the current legislative framework should be reviewed to examine whether it adequately addresses, and seeks to educate the public about, the environmental and health hazards that may be associated with the use of such products.

In developing national public information and education programmes, consideration should be given to working with non-governmental organisations, such as the Organic Growers’ Association and Counterpart Caribbean, that are already seeking to raise public awareness of environmental and sustainability issues.

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 national policy to promote and encourage greater awareness of the need for sound chemicals management. Employers should be made aware of the need to inform emergency response organisations, such as the fire service, of the presence of stock of chemicals and dangerous goods. Further to this, requirements to provide workers with ongoing training in safe chemicals use, handling and management, and to put in place effective occupational health and safety provisions, would be a welcome initiative.

### **11.3 Recommendations to Improve Public Awareness and Understanding**

Efforts to raise the level of understanding among workers and the public in the area of chemicals management could be enhanced by the implementation of the following recommendations.

- The use of the media to deliver public awareness and education programmes;
- The launch of an awareness programme in schools to sensitise children on the importance of the environment and the dangers that chemicals pose to the environment;
- The delivery of seminars targeting the farming community, to sensitise farmers on the appropriate use of chemicals in crop cultivation;
- Establishment of liaisons with community groups and non-governmental organisations to develop programmes to the dissemination of information to the public;
- Requiring that all workers involved in the transportation, handling, use, and disposal and management of chemicals receive the relevant training in sound chemicals management; and
- The provision of information to workers on potential health risks associated with chemicals use and handling, and the need to protect and monitor their personal health and safety.

The effectiveness of such initiatives would be enhanced by the development and strengthening of partnerships between Government, the private sector and non-governmental organisations.



## 12 Resources Available and Needed for Chemicals Management

The Ministry of Agriculture and Rural Development and the Ministry of Housing, Lands and the Environment are the key governmental authorities involved in chemicals management. However, as described in previous chapters, there are several other governmental institutions that play vital roles in the chemicals management process. This chapter provides an overview of resources existing within those ministries, department and agencies, and highlights chemicals management resource needs as identified by the institutions themselves.

### 12.1 Resources Available in Government Ministries and Institutions

There is a variety of types of expertise present within governmental institutions in Barbados. Some of this expertise was acquired through formal education to the tertiary level, some through professional development activities such as workshops and conferences, and some through on-the-job training and experience. All types of expertise are included in Table 12.A below.

Most of the government institutions surveyed do not make specific allocation of financial resources to chemicals management; therefore it was not possible to quantify the finances available annually to carry out chemicals management activities.

**Table 12.A: Resources Available in Government Ministries/Institutions**

<b>Ministry/Agency Concerned</b>	<b>Number of Professional Staff Involved</b>	<b>Types of Expertise Available</b>
<b>Environmental Protection Department (Ministry of Housing, Lands and the Environment)</b>	3	<ul style="list-style-type: none"> <li>• Policy Development</li> <li>• Hazardous Waste Management</li> <li>• Chemicals/Hazardous Waste Handling &amp; Safety</li> </ul>
<b>Environment Unit (Ministry of Housing, Lands and the Environment)</b>	n/a <sup>1</sup>	n/a
<b>Ministry of Agriculture and Rural Development</b>	8	<ul style="list-style-type: none"> <li>• Pathology</li> <li>• Entomology</li> <li>• Weed Science</li> <li>• Agronomy</li> <li>• Risk Analysis</li> <li>• Use and application of agrochemicals</li> </ul>
<b>Sewerage and Solid Waste Project Unit (Ministry of Health)</b>	n/a	<ul style="list-style-type: none"> <li>• Policy Development</li> <li>• Education and Awareness Raising</li> <li>• Hazardous Waste Management</li> </ul>
<b>Vector Control Unit (Ministry of Health)</b>	3	<ul style="list-style-type: none"> <li>• Environmental Health Management</li> </ul>
<b>Labour Department (Ministry of Labour and Social Security)</b>	6	<ul style="list-style-type: none"> <li>• Chemicals Handling and Safety</li> <li>• Occupational Health and Safety</li> </ul>
<b>National Council for Science and Technology (Ministry of Commerce, Consumer Affairs and Business Development)</b>	1	<ul style="list-style-type: none"> <li>• Training and Education</li> <li>• Policy Research</li> <li>• Development of Legislation</li> </ul>

**Table 12.A: Resources Available in Government Ministries/Institutions**

Ministry/Agency Concerned	Number of Professional Staff Involved	Types of Expertise Available
<b>Barbados Fire Service (Ministry of Home Affairs)</b>	4	<ul style="list-style-type: none"> <li>• Handling of Hazardous Chemicals</li> <li>• Chemicals Safety and Hazard Prevention</li> <li>• Accident and Emergency Response</li> </ul>
<b>Central Emergency Relief Organisation (Ministry of Home Affairs)</b>	n/a	<ul style="list-style-type: none"> <li>• Accident and Emergency Response and Planning</li> </ul>
<b>Government Analytical Services (Ministry of Agriculture and Rural Development)</b>	4	<ul style="list-style-type: none"> <li>• Chemical analysis</li> </ul>
<b>International Transport Division (Ministry of Tourism and International Transport)</b>	2	<ul style="list-style-type: none"> <li>• Administration of international maritime safety Conventions</li> </ul>
<b>Barbados Port Inc.</b>	3	<ul style="list-style-type: none"> <li>• Administration of international maritime safety Conventions</li> <li>• Storage and handling of dangerous goods</li> </ul>
<b>Barbados National Standards Institution</b>	n/a	<ul style="list-style-type: none"> <li>• Setting of standards for classification, labelling and handling of chemicals and other dangerous substances</li> </ul>
<b>Barbados Agricultural Development and Marketing Corporation</b>	n/a	<ul style="list-style-type: none"> <li>• Agricultural extension on topics including safe use and handling of agricultural chemicals</li> </ul>
<b>Barbados Statistical Service</b>	n/a	<ul style="list-style-type: none"> <li>• Collection, analysis and interpretation of statistical data</li> </ul>

<sup>1</sup> n/a: Information not available at the time of compilation of the Profile.

## **12.2 Resources Needed by Government Institutions to Fulfill Responsibilities related to Chemicals Management**

Although there is some chemicals management expertise present within government institutions, the information gathering carried out as part of the process of preparing this Profile revealed that there is still a need for 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.

Table 12.B summarises these resource needs, as identified by the agencies surveyed.

**Table 12.B: Resources Needed by Government Institutions to Fulfill Responsibilities Related to Chemicals Management**

Ministry/Agency Concerned	Type/Number of New Professional Staff Needed	Training Requirements for Existing Staff
<b>Environmental Protection Department (Ministry of Housing, Land and the Environment)</b>	Senior Chemicals Officer (1)	<ul style="list-style-type: none"> <li>• Design of chemicals storage facilities</li> <li>• Handling and storage of chemicals</li> <li>• Emergency response procedures</li> <li>• Chemicals risk management</li> <li>• Policy formulation and development</li> <li>• Hazardous chemicals/waste management</li> </ul>
<b>Ministry of Agriculture and Rural Development</b>	Head of Pesticides Unit (1)  Research and Database Officer (1)	<ul style="list-style-type: none"> <li>• Negotiating skills</li> <li>• Environmental Impact Assessment</li> <li>• Handling and storage of pesticides</li> <li>• Information technology and database management</li> </ul>
<b>Vector Control Unit (Ministry of Health)</b>	Environmental Health Officers (6; one for each environmental health catchment)	<ul style="list-style-type: none"> <li>• Chemicals management and environmental health to the Diploma level</li> </ul>
<b>Labour Department (Ministry of Labour and Social Security)</b>	Industrial Hygienist (1)	<ul style="list-style-type: none"> <li>• Training in chemicals management for staff working in Occupational Health and Safety</li> </ul>
<b>Barbados Fire Service (Ministry of Home Affairs)</b>	None identified	<ul style="list-style-type: none"> <li>• Training of approximately 3 persons per year over the next five years in chemicals safety and handling and chemicals-related emergency response</li> </ul>

**Table 12.B: Resources Needed by Government Institutions to Fulfill Responsibilities Related to Chemicals Management**

Ministry/Agency Concerned	Type/Number of New Professional Staff Needed	Training Requirements for Existing Staff
<b>Customs Department</b>	None identified	<ul style="list-style-type: none"> <li>• Implementation of trade controls related to chemicals and other dangerous goods</li> <li>• Profiling and identification of chemicals, including information on placarding, labelling, packaging, trade and scientific names and designations, and appearance of chemicals as they are traded</li> <li>• Use of applicable regional and international Customs codes</li> </ul>
<b>Barbados Agricultural Development and Marketing Corporation</b>	None Identified	<ul style="list-style-type: none"> <li>• Safe storage and disposal of chemicals</li> <li>• Pesticides poisoning response procedures</li> <li>• Selection and use of personal protective equipment</li> </ul>
<b>Sanitation Services Authority</b>	None Identified	<ul style="list-style-type: none"> <li>• Occupational Health and Safety</li> <li>• Use of personal protective equipment</li> <li>• Safe handling and disposal of chemicals and hazardous materials</li> <li>• Public relations/public awareness raising</li> </ul>
<b>Government Analytical Services</b>	Trace Organics Analyst (1) Pesticide Residues Analyst (2)	<ul style="list-style-type: none"> <li>• Analysis for pesticide residues in food crops and environmental samples</li> <li>• Trace Organic Analysis</li> <li>• Environmental Toxicology</li> <li>• Laboratory Quality Analysis/Quality Control</li> <li>• Occupational Health and Safety</li> </ul>

## 12.3 Comments/Diagnosis

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 these existing personnel to better carry out their relevant duties, particularly in regulatory and emergency response organisations. Further to this, 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 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. A prime example can be found in the Labour Department, where there are only four Factory Inspectors responsible for regulating over 800 establishments island-wide. 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.

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