

**BASELINE STUDY
TOWARDS
NON TOXIC ENVIRONMENT IN AFRICA
COUNTRY REPORT**

MAURITIUS



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Basel Convention Regional Centre
Pretoria
for English-speaking African countries



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Acronyms and Abbreviations

| | |
|-------|---|
| ACIM | Association Consomateurs de l'Ile Maurice |
| AREU | Agricultural Research Extension Unit |
| BCRC | Basel Convention Regional Centre |
| CEB | Central Electricity Board |
| CIA | Central Intelligence Agency |
| CPE | Certificate of Primary Education |
| CRC | Convention on the Rights of the Child |
| CSO | Central Statistics Office |
| CWA | Central Water Authority |
| DCC | Dangerous Chemical Control |
| DCCB | Dangerous Chemical Control Board |
| DDT | Dichlorodiphenyltrichloroetane |
| EPZDA | Export Processing Zone Development Authority |
| EPA | Environmental Protection Act |
| GDP | Gross Domestic Product |
| GHS | Global Harmonized System |
| GoM | Government of Mauritius |
| HSC | Higher School certificate |
| KemI | Swedish Chemicals Agency |
| MoA | Ministry of Agro Industry and Fisheries |
| MBC | Mauritius Broadcasting Corporation |
| MoE | Ministry of Environment and National Development Unit |
| MEA | Multilateral Environmental Agreement |
| MoH | Ministry of Health & Quality of Life |
| MoL | Ministry of Labour, Industrial Relations & Employment |
| MoLG | Ministry of Local Government |
| MoP | Ministry of Public Utilities |
| MSB | Mauritius Standards Bureau |
| MSIRI | Mauritius Sugar Industry Research Institute |
| MSW | Municipal Solid Waste |
| MUR | Mauritian Rupee |
| NIP | National Implementation Plan |
| NPCS | National Parks and Conservation Service |
| OSHW | Occupational Safety Health and Welfare |
| PCT | Physico-Chemical Treatment |
| PET | Polyethylene Terephthalate |
| POP | Persistent Organic Pollutants |
| ppm | Parts Per Million |
| SAICM | Strategic Approach towards International Chemicals Management |
| SC | School Certificate |
| SME | Small and Medium Enterprises |
| STAM | Société de Traitement et d'Assainissement des Mascareignes |
| WMA | Wastewater Management Authority |
| WWTP | Wastewater Treatment Plant |

Executive Summary

Introduction

The Basel Convention Regional Centre in Pretoria (BCRC) and the Swedish Chemicals Agency (KemI) initiated a regional cooperation in Anglophone Africa to enhance chemicals management through the implementation of the Strategic Approach towards International Chemicals Management (SAICM), the Stockholm convention, the Rotterdam Convention and the Basel Convention. In this respect, the two partners, BCRC and KemI, identified four countries namely, Zambia (Southern Africa) Nigeria (West Africa), Mauritius (Small island nations) and Kenya (East Africa) to participate in a pilot study whose aims were to collect baseline information regarding National Chemicals and Wastes, to assess the capacity of national institutions to manage chemicals and wastes and to review the environmental legal frameworks.

The main objectives of this pilot study were:

- To establish baseline data on National Chemicals and Wastes
- To assess the capacity of national institutions to manage chemicals and disposal facilities
- To review environmental legal frameworks and regulations
- To make an inventory of: (i) Industries using chemicals
(ii) Chemical importers / exporters
- To assess the capacity and needs for training

Background country information

The Republic of Mauritius lies in the South West of the Indian Ocean. It comprises the main island Mauritius and the islands of Rodrigues, Agalega Islands, Cargados Carajos Shoals (Saint Brandon) as well as a number of islets. The Republic of Mauritius covers a total surface area of 2.040 km² and as at December 2006 the population was 1,256,739 with an average age of 32.3 years and a life expectancy of 72.9 years.

In 2005, the labour force of Mauritius was about 506,000 with an unemployment rate of 9.6%. The industrial/manufacturing and agricultural sectors contributed about 27.5% to the Gross Domestic Product (GDP). These two sectors employed about 167,200 individuals that represented about 33% of the Mauritian work force. Sugar cane and textile were and still are the major crop and activity for these two sectors respectively.

Manufacture, production, importation, exportation and use of chemicals

Mauritius does not mine, produce or manufacture any raw chemicals. All the chemicals that are needed by the various economic sectors of Mauritius are imported, mainly from South Africa, France and United Kingdom. However, Mauritius produces significant amount of sugar and ethanol from sugar cane.

For the year 2005, Mauritius imported more than 3,000,000 tons of chemicals and chemical products with petroleum products, industrial chemicals and cement being the major ones.

Mauritius practically does not export raw chemicals since there is no local production or manufacturing of chemicals. In fact, Mauritius imports raw materials / chemicals and then these are blended and processed into either semi-finished products or finished products and are re-exported, towards European and African countries mainly.

Solid waste and hazardous waste

The Ministry of Local Government is the regulatory authority responsible for setting policy and practice in solid waste and hazardous waste management. While solid waste is adequately managed through proper land filling in Mauritius, the management of hazardous waste needs to be improved. Presently, only a small proportion of the hazardous waste produced in Mauritius is adequately disposed of at the hazardous waste cell at the Mare Chicose landfill site. Most of the hazardous wastes are either kept at the sites where they are produced and are under the responsibility of the respective hazardous waste generator or are illegally dumped in the environment.

Legal framework and Convention status

In Mauritius, the main pieces of legislation that exist for the management of chemicals and hazardous wastes are:

- DCC Act 2004 – Ministry of Health and Quality of life
- Chemical Fertilizers Control Act 1980 – Ministry of Agro Industries and Fisheries
- EPA 2002 – Ministry of Environment and National Development Unit
- Food Act 1998 - Ministry of Health and Quality of life

Mauritius has already ratified all chemicals and wastes conventions (Rotterdam, Stockholm, Basel and Montreal protocol) and will foster synergies among these conventions through the Multilateral Environmental Agreement (MEA) Coordinating Committee under the forthcoming amended Environment Protection Act 2002. The MEA Coordinating Committee is already working under the chairmanship of the Director of Environment (MoE). The members of this committee are constituted by representatives of main stakeholders (e.g. Ministry of Health, Ministry of local Government, University of Mauritius, Ministry of Agriculture, etc..) This committee meets regularly and they have already met twice.

Situation analysis within SAICM

According to the responses of the surveys carried out in this study, most of the participating stakeholders including key ministries, local authorities, private sector, academia and NGOs are generally aware about the risks that chemicals may pose to human health and to the environment. They also are aware that there is need to soundly

manage these chemicals throughout their lifecycles, more specifically those that are considered dangerous.

However, ministries and governmental bodies are better informed regarding existing measures in the country that protect humans and the environment from exposures to chemicals. On the other hand, most stakeholders have very little knowledge regarding risk assessment and management of chemicals. For many of the respondents to the questionnaires, administration and poor cooperation between agencies are the main reasons for the low dissemination of information and knowledge on chemicals and chemical management amongst stakeholders and to the public.

The surveys also revealed that there is need for capacity building and training not only for relevant stakeholders but also for groups at risk. The different areas for training and capacity building include: risk analysis and management, GHS for labelling of chemicals, cleaner production and management of hazardous wastes amongst others. The capacity of the country to deal with existing and new global environmental issues was also judged as rather low by all stakeholders. The reason for this shorting coming is probably the lack of resources and the delayed communication between the government and international bodies. Training is needed, both for government officials and other stakeholders on how to deal with poisoning and chemicals incidences.

Conclusions

In Mauritius, in general the adequate legislation exists for the management of chemicals throughout their life cycle. These regulations, which need to be improved to include all POPs, fall under three main pieces of legislation:

- DCC Act 2004
- EPA 2002
- Food Act 1998

However, due to lack of resources amongst other reasons, enforcement of these legislations is very often poor.

It is important to note that;

- (i) Mauritius does not export raw chemicals, but imports raw materials including industrial and agricultural chemicals and exports semi finished and finished products.
- (ii) Whilst general waste is adequately management by the Ministry of Local Government, chemical waste and more generally hazardous management is of serious concern for the island. As it has been observed, very little has been done in this area yet. The lack of proper infrastructure to accommodate these categories of waste is highly affecting the enforcement of the relevant legislations.

- (iii) The generators of Hazardous waste lack guidance to handle and manage their hazardous wastes. The whole structure of collection, storage and proper disposal should be re-looked into. National Cleaner Production Centres that will be established under the responsibility of the National Productivity Council soon, can also include in their objectives to give proper training on Cleaner Production Concepts and encourage material substitution.
- (iv) There are already actions taken against the problem of the hazardous waste management: Workshops on hazardous waste management take place and a hazardous waste management information system is being developed, which should contain a database of hazardous waste generators and their waste streams. At the moment, the reports on hazardous waste generation are limited, therefore the data base does not really work. As a result, the government has no clear idea what is happening concerning the production and treatment of hazardous waste.
- (v) Other projects search for solutions of the hazardous waste. The results are awaited soon and should be operational by 2009.
- (vi) Furthermore, although some efforts have been done to promote recycling, for example recycling of PET bottles, paper, glass or used oil, much more can be done in this direction to considerably reduce the amount of solid waste (about 380,000 tons) that is disposed of at the Mare Chicose Landfill site annually.
- (vii) The surveys revealed that most of the stakeholders lacked capacity in risk analysis and risk management regarding chemicals.
- (viii) The capacity of the country to deal with existing and new global environmental issues is also judged as rather low by all stakeholders. The reason for this shorting coming is probably the lack of resources and the delayed communication between the government and international bodies.
- (ix) The surveys also revealed cooperation and information exchange between various stakeholders is not sufficient and need to be improved.

Recommendations

The emerging issues of global concern such as the management of chemical and chemical waste should not be overlooked as less important than existing problems. Establishment of proper poison centres can help the public to benefit from proper awareness related to better chemical usage, storage and disposal so that the least impacts are caused to the humans and the environment.

Mandatory risk audits are fixed by law, however due to lacking resources and trained auditors, the law is not enforced. Environmental reporting should be made mandatory and more resources should be allocated to the enforcement of laws and regulations.

Use of existing measures and reorganisation:

Mauritius has many good initiatives. It is important that the country makes appropriate use of them:

- (i) Mauritius has a Multilateral Environmental Agreements Coordinating Committee. The members of this committee are constituted by representatives of main stakeholders (e.g. Ministry of Health, Ministry of local Government, University of Mauritius, Ministry of Agriculture, etc.) This committee meets regularly and they have already met twice.
- (ii) The NIP, has identified stockpiles of POPs. Currently, a medium size project is being developed jointly by the Ministry of Environment and UNDP, Mauritius for the disposal of these POPs.
- (iii) The mechanism for developing a national profile and priority actions for the country should be reviewed, as there seems to be unclear lines of responsibilities.
- (iv) Restructuring of the existing infrastructures e.g. Police de L'Environment can also help greatly to alleviate the ministries of environment and health from doing enforcement of the legislations and thus devote more time to the priorities management issues like hazardous waste. The government can look into increasing the human capacity and skills development of the Police De L'Environment.

Training and capacity building

- (v) Training is needed, both for government officials and other stakeholders on how to deal with poisoning and chemicals incidences.
- (vi) Lack of information among the different responsible groups can be enhanced through networking and holding of national workshops.
- (vii) The lack of information among the second group of stakeholders (private, NGO, groups at risk, etc.) and especially among groups at risk like chemical dealers should be enhanced by including them in workshops and trainings. Furthermore, the communication between these two groups of stakeholders should be improved;
- (viii) In terms of capacity building, specialized courses can be mounted at the request of the ministries or stakeholders (e.g. chemical dealers) by the University of Mauritius. For more specialized skills e.g. transport of hazardous waste, external expertise can also be sought.

- (ix) International assistance for training of local stakeholders would also be very beneficial in areas where local expertise is limited. Networking is needed in order to enhance cooperation among stakeholders. Data gaps on the generated chemical waste need to be filled;

Summary of the specific recommendations

For the better management of chemicals and their wastes, general and hazardous wastes, and for the protection of population against toxic effects of chemicals, it is important that the authorities consider the following specific recommendations for Mauritius, which will help in addressing the gaps which have been identified:

- (i) To allocate more resources to ensure proper enforcement of laws and regulations managing chemicals throughout their lifecycles;
- (ii) To review the overlapping of responsibilities and legislations;
- (iii) Until the coming into operation of the interim hazardous facility in 2010: to ensure that hazardous wastes generated are properly handled and stored;
- (iv) To promote cleaner production that will reduce the generation of hazardous waste;
- (v) To promote recycling in order to reduce the volume of waste to be treated at the Mare Chicose landfill site;
- (vi) To establish proper poison centres;
- (vii) The implementation of GHS for labelling of chemicals;
- (viii) To promote cooperation and information exchange amongst the stakeholders involved in management, importation, exportation, transport and use of chemicals locally, regionally and internationally.

Specific areas where projects can be developed

Table A: Possible project areas

| SAICM AREA | Possible Projects |
|--|---|
| RISK REDUCTION | Building of capacities to deal with poisoning and chemical incidences |
| | Occupational Health and Safety |
| | Chemicals of global concern |
| | Highly toxic pesticides-risk management and reduction |
| | Waste management (minimization) |
| | Formulation of prevention and response measures to mitigate environmental and health impacts |
| | The Role of GHS in risk Reduction |
| | |
| KNOWLEDGE AND INFORMATION | Hazardous data generation and availability |
| | Globally Harmonized System (GHS) of Classification and Labelling |
| | Information management and dissemination |
| | Highly toxic pesticides risk management and reduction |
| | Creation of National and International Registers |
| | |
| GOVERNANCE | Stakeholder participation in decision making processes |
| | Assessment of national chemical management to identify gaps and prioritize action |
| | Implementation of integrated national programmes for sound management of chemicals |
| | GHS (review of national legislation and align with GHS requirements) |
| | Social and economic considerations |
| | Legal, Policy and institutional aspects |
| | EIAs to include chemicals and hazardous waste |
| | |
| CAPACITY BUILDING AND TECHNICAL COOPERATION | Capacity-building to support national actions |
| | Formulation of preventive and response measures to mitigate environmental and health impacts of emergencies involving chemicals |
| | Remediation of contaminated sites and poisoned individuals |
| | |
| ILLEGAL AND INTERNATIONAL TRAFFIC | Prevention of illegal traffic in toxic and dangerous goods |

1. INTRODUCTION TO THE DOCUMENT

Africa participated effectively during the Strategic Approach towards International Chemicals Management (SAICM) process which led to its adoption by the world environmental ministers in February 2006 in Dubai. The following five SAICM focal areas were adopted:

- **Risk Reduction**
- **Knowledge and Information**
- **Governance**
- **Capacity Building and International cooperation**
- **Illegal International traffic**

The Dubai meeting, proposed quick start up actions towards the International Chemicals Management. This approach was also endorsed at the recent 11th African Ministerial Conference on Environment (AMCEN) meeting held in Congo Brazzaville from 22-26 May 2006 as a policy framework key to the realization of the 2020 Chemicals goal of the Johannesburg Plan of Implementation and called upon an all inclusive multi-sectoral and multi-stakeholder approach. ¹The African response towards SAICM implementation is articulated in the African plan for the implementation of SAICM. This plan sees challenges on how SAICM implementation can be raised as a priority issue at the national level, given the range of competing problems and issues facing most African countries. It also emphasizes the importance of defining how SAICM implementation activities can effectively support other programmes and objectives, recognising that managing chemicals is one component of **broader national** efforts to achieve environmental protection and sustainable industrial and agricultural development. Some of the key areas that have to be addressed are to demonstrate on how:

- SAICM can contribute to **national efforts** to promote pollution prevention and cleaner production, particularly within small and medium-sized enterprises.
- decisions made in the context of SAICM implementation can have an impact on regional and international trade
- stronger management of chemicals positively might influence the country's international image and the market for its products
- Improvements in chemical safety enhance the health and quality of life of its citizens.

This project seeks to contribute to the **first steps** for the implementation of the SAICM. A regional approach in the capacity building to address chemicals and waste issues has been re-emphasized and articulated through the recent AMCEN XI meeting held in Congo Brazzaville in June 2006 which emphasizes through Decision 5(j), “To request international and regional partners to support efforts to strengthen the ability of the Basel Convention regional centres to undertake capacity-building for chemicals and hazardous waste management in related multilateral environmental agreements in Africa, in line with the objectives of the Strategic Approach to International Chemicals Management

¹ African Action Plan on Implementation of SAICM

and the environment initiative of the New Partnership for Africa's Development (NEPAD)". At the Cairo African Regional SAICM meeting held from 11-17th Sept 2006, the Regional action plan was endorsed for implementation. Thus the BCRC-KemI project has adopted a regional approach in its activities.

The Basel Convention Regional Centre in Pretoria (BCRC) and the Swedish Chemicals Agency (KemI) initiated a regional cooperation in Anglophone Africa to enhance chemicals management through the implementation of the Strategic Approach towards International Chemicals Management (SAICM), the Stockholm convention, the Rotterdam Convention and the Basel Convention. In this respect, the two partners, BCRC and KemI, identified four countries namely, Zambia (Southern Africa) Nigeria (West Africa), Mauritius (Small island nations) and Kenya (East Africa) to participate in a pilot study whose aims were to collect baseline information regarding National Chemicals and Wastes, to assess the capacity of national institutions to manage chemicals and wastes and to review the environmental legal frameworks.

The authors would like to point out that the National Chemical Profile for Mauritius was not undertaken at the start of this pilot study and for this reason the report suffered much delay. Furthermore, given the very short time period planned for this assignment, it was not possible to fully complete Questionnaire 1 (National Chemical Profile). Nevertheless, appropriate information has been gathered for the successful completion of this report.

2. Overview of the Objectives

The main objectives of this pilot study were:

- To establish baseline data on National Chemicals and Wastes
- To assess the capacity of national institutions to manage chemicals and disposal facilities
- To review environmental legal frameworks and regulations
- To make an inventory of: (i) Industries using chemicals
(ii) Chemical importers / exporters
- To assess the capacity and needs for training

3. Methodology

As mentioned earlier, the National Chemical Profile for Mauritius has not been undertaken and thus the project suffered much delay as all baseline information regarding chemicals had to be gathered and compiled. Information and data were obtained mainly through:

- Central Statistics Office (CSO) website (CSO, 2007)
- Websites of relevant ministries e.g. Environment, Health, Labour, etc.
- National Implementation Plan (NIP) report on POPs and other National reports
- Face to face and phone interviews

Moreover, key persons from different ministries, institutions and governmental bodies were invited to fill the different questionnaires associated to this study.

4. Background country information

The main island Mauritius was formerly a French colony (1715 – 1810) and became a British colony in 1810. It acceded its independence on 12 March 1968 and to the status of Republic within the Commonwealth in 1992. The Capital City is Port Louis and is found in the north west of Mauritius Island, which with Rodrigues are the two main islands of the country. Their respective populations are 1,219,000 and 37,000 while the other islands are not inhabited. Most of the economic activities lie in Mauritius and very little in Rodrigues, and for these reasons only Mauritius has been considered for this assessment. Therefore, all the information given in the following sections will concern only Mauritius, and whenever the other islands have been included in the discussion it will be clearly pointed out.

4.1. Basic National data



Source: The Government of Mauritius Web Portal²

4.1.1 Physical and Demographic Context

This section deals with the physical and demographic of the main island Mauritius. The information given below has been obtained either from the Central Statistics Office of Mauritius (CSO, 2007) or from the CIA Factbook (CIA Factbook, 2007).

² <http://www.gov.mu/portal/site/abtmrtius/menuitem.9eb76f322dcc02984d57241079b521ca/>, June 2005.

- Size of the Country (area in square km):

The overall surface area of the Republic of Mauritius is 2.040 km² including all islands. Mauritius has a surface area of about 1850 km² and Rodrigues 110 km².

- Form of Government:

In Mauritius, the form of Government is a Parliamentary democracy with a Prime Minister as Head of Government, and a nominated President as Chief of State.

- Official Language(s):

The official language in Mauritius is English. However, French is the more commonly spoken and used language by the media for communication.

- Local Language(s):

The local languages include Creole that is spoken by nearly all the Mauritian population and Bhojpuri spoken by about 13 % of the population (CIA Fact book, 2007).

- Total Population:

The total population of the Republic of Mauritius as at December 2006 is 1,256,739 as seen in the table below taken from CSO website (CSO, 2007).

Table 4.1: Population of the Republic of Mauritius

| Island | Population | | Change | |
|--------------------------------|------------------|------------------|--------------|------------|
| | 31 December 2005 | 31 December 2006 | Number | % |
| Island of Mauritius | 1,211,302 | 1,219,220 | 7,918 | 0.7 |
| Island of Rodrigues | 36,994 | 37,230 | 236 | 0.6 |
| Agalega and St. Brandon | 289 | 289 | 0 | 0.0 |
| Republic of Mauritius | 1,248,585 | 1,256,739 | 8,154 | 0.7 |

Source CSO 2007

- Urban Population (% plus definition of urban):

In the Mauritius, Urban population refers to the population living in the five Municipal Council Areas namely: Port Louis; Beau Bassin / Rose Hill; Quatres

Bornes; Vacoas / Phoenix and Curepipe. According to figures from CSO, at 1st July 2005, for the island of Mauritius 43.5% of the population live in the urban area. (CSO, 2007)

- Rural Population (% plus definition of rural):

The definition of Rural Population refers to the population not living in the Urban Area as defined in the previous section. Figures from CSO indicate that 56.5 % of the population live in the rural area in Mauritius Island (CSO, 2007).

- Average Age of the Population:

The age distribution for the population (CSO, 2007) for the island of Mauritius at 1st July 2005 is given in Table 4.2.

Table 4.2: Average age of the population of Mauritius

| | Male | Female | Both sexes |
|------------|------|--------|------------|
| Mean age | 31.6 | 33.1 | 32.3 |
| Median age | 30.0 | 31.3 | 30.7 |

- Population of Working Age (e.g., 15 - 65):

The official age for retirement in the Republic of Mauritius is 60 years. Therefore, the 15 – 59 age range has been considered and data given in Table 4.3 are for the year 2005 and for the island of Mauritius (CSO, 2007).

Table 4.3: Population of working age for Mauritius

| Age group | Male | Female | Both sexes | |
|-----------|---------|---------|------------|------|
| | | | Number | % |
| 15 - 59 | 398,394 | 399,384 | 797,778 | 66.1 |

- Birth Rate:

The birth rate for Mauritius Island was 14.9 births / 1,000 persons for 2005 according to CSO (2007).

- Life Expectancy:

The life expectancy at birth estimated for 2007 (CIA Factbook, 2007) for the island of Mauritius is given in Table 4.4.

Table 4.4: Life expectancy in Mauritius: estimation for 2007

| Both sexes | Male | Female |
|------------|------|--------|
|------------|------|--------|

| | | |
|------|------|------|
| 72.9 | 68.9 | 76.9 |
|------|------|------|

- Literacy Rate:

Taking literacy as “person of age 15 and over that can read and write” as defined in the CIA Factbook, the estimated data (for 2003) for Mauritius is compiled in the table below.

Table 4.5: Literacy rate for Mauritius: estimation for 2003.

| | | |
|------------|-------|--------|
| Both sexes | Male | Female |
| 85.6% | 88.6% | 82.7% |

- Average Education Level of Population:

The data given in the table below concern the level of education attained by a Mauritian aged 5 years or above. The level of education is defined by the highest academic qualification that a person has achieved. These data come from a census carried out in 2000 in the Republic of Mauritius (CSO, 2007).

Table 4.6: Education level of the Mauritian population as of 2000.

| Educational Attainment | Population | % |
|---|-------------------|----------|
| Nil & Pre-primary | 84,514 | 10.2 |
| Primary: Std I – VI not passed CPE | 313,903 | 37.9 |
| Passed CPE | 45,587 | 5.5 |
| Secondary: Form I - III | 82,975 | 10.0 |
| Form IV –V not passed SC | 126,909 | 15.3 |
| Passed SC or equivalent | 103,437 | 12.5 |
| Passed HSC or equivalent | 48,920 | 5.9 |
| University degree or equivalent | 18,986 | 2.3 |
| Not stated | 2,580 | 0.3 |
| Total | 827,811 | - |

Source CSO 2007

- Unemployment Rate:

According to data obtained from CSO (2007), the unemployment rate was estimated at 9.6% for the year 2005. The table below gives the labour force, employment and unemployment for the Republic of Mauritius for 2005. In the table, the unemployment percentage is calculated with respect to the labour force.

Table 4.7: Employment and unemployment rates in Mauritius

| | Male | Female | Both sexes |
|-----------------------|-------------|---------------|-------------------|
| Labour Force | 349,400 | 193,100 | 542,500 |
| Employment | 338,200 | 168,800 | 507,000 |
| Unemployment | 20,300 | 31,800 | 52,100 |
| % Unemployment | 3.7 | 5.9 | 9.6 |

Source CSO 2007

- Percentage of Women Employed Outside the Home:

The figures given in Table 4.7 correspond to the number of women employed outside the home. The figures correspond to an employment rate of 31.1 % of women with respect the total labour force, and these figures indicate that 87.4% of female labour force is employed outside the home.

4.1.2 Political/Geographic Structure of the Country

4.1.2.1 Political structure

The Republic of Mauritius is a democratic state where the President is the Chief of State and the Prime Minister is the Head of Government.

The Constitution of Mauritius provides for the Parliament of Mauritius to consist of the President and the National Assembly. The Parliament of Mauritius is modelled after the Westminster system of parliamentary democracy, where Members of Parliament are voted in at regular general elections, on the basis of a first past the post system (GoM, 2007).

The National Assembly is made up of 70 Members of whom 62 are directly elected in 21 constituencies. The island of Mauritius is divided into 20 constituencies returning 3 members each and that of Rodrigues is a single constituency returning 2 members. After a general election, the Electoral Supervisory Commission may nominate up to a maximum of 8 additional members in accordance with section 5 of the First Schedule of the Constitution with a view to correct any imbalance in community representation in Parliament. This system of nominating members is commonly called the best loser system (GoM, 2007).

The functions of the National Assembly include the making of laws, the controlling of the finances of the State and also a critical role to check the actions of government and the Ministries (GoM, 2007).

The political party or party alliance that wins the majority of seats in Parliament forms the government and its leader usually becomes the Prime Minister. It is the Prime Minister who selects the members of the composition of the Cabinet from elected members of the Assembly, except for the Attorney General who may not be an elected

member of the Assembly The political party or alliance which has the second largest majority forms the Official Opposition and its leader is normally nominated by the President of the Republic as the Leader of the Opposition. The Assembly elects a Speaker, a Deputy Speaker and a Deputy Chairman of Committees as one of its first business (GoM, 2007).

4.1.2.2 Geographic structure, population distribution, local authorities and responsibilities

The Republic of Mauritius is divided into ten districts, nine, namely: Plaines Wilhems, Port Louis, Flacq, Rivière du Rempart, Pamplemousses, Savanne, Black River, Moka and Grand Port, which are located on the island of Mauritius and Rodrigues constitutes the tenth district. The other uninhabited islands constitute the dependencies of the Republic.

Locally, the nine districts found in Mauritius are administered either by municipal or district councils as detailed in Table 4.8 where as Rodrigues Island is autonomously administered by the Rodrigues Regional Assembly.

Table 4.8: Local authorities – District and Municipal Councils of Mauritius

| Local authority | Region / District administered |
|---|---|
| Municipality of Port Louis | District of Port Louis |
| Municipality of Beau Bassin / Rose Hill | Towns of Beau Bassin and Rose Hill found in the district of Plaines Wilhems |
| Municipality of Quatre Bornes | Town of Quatre Bornes found in the district of Plaines Wilhems |
| Municipality of Vacoas / Phoenix | Towns of Vacoas and Phoenix found in the district of Plaines Wilhems |
| Municipality of Curepipe | Town of Curepipe found in the district of Plaines Wilhems |
| Moka / Flacq District Council | Districts of Moka and Flacq |
| Pamplemousses / Rivière du Rempart District Council | Districts of Pamplemousses and Rivière du Rempart |
| Grand Port / Savanne District Council | Districts of Grand Port and Savanne |
| Black River District Council | District of Black River |

Source: GoM 2007

Duties of Local Authorities under Section 51 of the Local Government Act are wide-ranging. Within the limits of the area under its jurisdiction, a municipal or district council is responsible for the following (GoM, 2007):

- subject to the Roads Act -
 - (i) the cleansing and lighting of all motorways and main roads;

- (ii) the construction, care, maintenance, improvement, cleansing and lighting of all public roads;
- the collection and removal to approved disposal sites of household, industrial, commercial and agricultural waste and of such other waste as the Minister may direct to be collected and removed;
 - the undertaking of works of afforestation, terracing and tree planting alongside public roads, and for the purpose of such planting, cut and remove any tree growing within 7 feet of any public road unless the owner of the land bordering such road elects to cut and remove the tree himself within such time as should be fixed by the local authority;
 - the provision and regulation of public markets, fairs and places of public auction;
 - the control, care, management, maintenance, improvement and cleansing of all pavements, drains, bridges, beds and banks of lakes, rivulets and streams;
 - the construction, care, management, maintenance, improvement, cleansing and lighting of squares, open spaces, parks, gardens, bus shelters, public buildings including lavatories, baths and swimming pools, open and dedicated to the use of, or used by the public, not being the property of the State;
 - the construction, management, maintenance and improvement of public libraries, exhibition halls and art galleries, theatres, places of public entertainment, playing fields, cemeteries and cremation grounds, nurseries for infants, pre-primary schools;
 - the provision and maintenance of parking places for private cars;
 - the control of pollution causing a public and private nuisance;
 - the organization of welfare, sports and cultural activities;

However, the Ministry of Environment and National Development Unit (MoE) deal with all major environmental problems that may occur in the country irrespective of the region or area, for example soil or water pollution caused by industries. Similarly, all health issues such disease outbreak (e.g. Chikungunya outbreak due to mosquitoes in 2005) are the direct concern of the Ministry of Health and Quality of Life (MoH).

The different ethnic groups in Mauritius are: Indo-Mauritian 68%, Creole 27%, Sino-Mauritian 3%, Franco-Mauritian 2% practicing the following religions: Hindu 52%, Christian 28.3% (Roman Catholic 26%, Protestant 2.3%), Muslim 16.6%, other 3.1%. Except in Rodrigues where the majority of the population are from the Creole ethnic group. In Mauritius there are no particular groupings of any ethnic group living in a particular region or area.

4.1.3 Industrial and Agricultural Sectors

During these last thirty years, Mauritius has successfully diversified its economic activities from a supported mono-crop economy, sugar cane, to other sectors including

Textile, Tourism and Financial Services. It is now focusing on Information & Communication Technology and on a Seafood Hub that has just been created.

The following tables (Tables 4.10, 4.11, 4.12, and 4.13) give details about the contribution of the industrial and agricultural sectors to GDP and employment in Mauritius, the major products manufactured, the breakdown of agricultural production by region and size of productive areas in hectares (CSO, 2007).

Note that for this assessment, Mauritius Island has been divided into five regions (North, South, East, West and Centre) regrouping one, two or three districts as shown in Table 4.9

Table 4.9: Regions of Mauritius Island

| Region | Constituency districts |
|--------|-----------------------------------|
| North | Pamplemousses, Riviere du Rempart |
| South | Savanne, Grand Port |
| East | Flacq |
| West | Black River |
| Centre | Plaines Wilhems, Moka |

Source GoM 2007

Table 4.10: Overview of the Industrial and Agricultural Sectors

| Sector | Contribution to the Gross Domestic Product (%) | Number of Employees | Major Products in each Sector |
|---|--|---------------------|---|
| Industrial/ Manufacturing Sector ¹ | 21.7 | 118,200 | Textile and wearing apparel Food products Beverage Tobacco Consumer goods |
| Mining and Extraction | 0.1 | 182 | |
| Agricultural Sector | 5.8 | 49,000 | Sugar Cane Sugar Food crops Tea |
| TOTAL | 27.6 | 167,382 | |

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

Source: CSO, 2005

Table 4.11: Structure of the Manufacturing/Agricultural Sector

| | Micro Farms/ No of Facilities ¹ | Small Farms/ No of Facilities ² | Medium Farms/ No of Facili- ties ³ | Big Farms/ No of Facilities ⁴ | Total |
|-------------------------------------|---|---|---|---|-------------|
| Industrial/ Manufacturing Sector | 244 (27.6%) | 451 (51.1%) | 124 (14.0%) | 64 (7.3%) | 883 |
| Agricultural Sector | 135 (60%) | 55 (24.4%) | 18 (8%) | 17 (7.6%) | 225 |
| TOTAL | 379 | 506 | 142 | 81 | 1108 |

(1) 1 to 19 employees; (2) 20 to 100 employees; (3) 101 to 299 employees; (4) More than 300 employees
Source: CSO, 2007

Table 4.12: Breakdown of Agricultural Production by Regions

| Region | Major Crops | Production in tons | Total Number of Employees* | Size of Productive Areas (hectares) |
|--------------|------------------------------------|-----------------------|-------------------------------|--|
| North | Sugar cane Food Crop Tobacco | 1,304,000 | 4,000 | 18,500 |
| East | Sugar cane Food crop | 1,347,000 | 3,700 | 19,500 |
| South | Sugar cane Food crop Tea | 1,750,000 | 6,000 | 24,600 |
| West | Sugar cane Food crop | 503,000 | 1,500 | 6,100 |
| Centre | Sugar cane Food crop Tea | 480,000 | 2,500 | 9,400 |
| TOTAL | | 5,384,000 | 49,000** | 78,100 |

It was not possible to obtain figures for total number of employees for each region. The figures reported here correspond to employees in large establishments/farms/factories only (CSO, 2007). ** The total refers to the overall agricultural sector including small and medium companies or units .
 Source: CSO (2007)

Table 4.13: Breakdown of Industrial Production by Region*

| Region | Major Products | Total Value of , production**** | Number of Industrial Facilities | Number of Employees |
|---------------|--|------------------------------------|--|------------------------|
| North | - Textile and wearing apparel - Tobacco | | 385 | 30,500 |
| East | - Textile and wearing apparel | | 39 | 4,200 |
| South | - Textile and wearing apparel | | 52 | 6,700 |
| West | - Textile and wearing apparel - Consumer goods | | 21 | 1,300 |
| Centre | - Textile and wearing apparel - Food products - Beverage | | 381 | 35,800 |
| TOTAL | | 1,000 M\$*** | 878 | 118,200** |

*The figures in the table refer to a census carried out by CSO (2007) in 2005 regarding only large establishments / units / factories. ** The total refers to total employees for the whole industrial sector including small and medium establishments / units / factories. *** It was not possible to obtain breakdown figures, only the overall total is reported.

Source: CSO (2007)

4.1.4 Industrial Employment by Major Economic Sectors

The Table below (Table 4.14) gives the details of the industrial sector with regards to number of facilities, employment, output value and Table 4.15 gives major emissions

Table 4.14: Industrial Employment by Major Economic Sector* without emissions**

| ISIC Code ¹ | Description | Number of Facilities | Total Employment | Output Value (per year) (Million \$) |
|------------------------|--|----------------------|------------------|--------------------------------------|
| 31 | Food Industry (including sugar) | 146 | 15,000 | 1,235 |
| 32 | Textiles/Clothing and Leather Goods | 345 | 60,000 | 925 |
| 33 | Wood and Wood Products, Printing, publishing, reproduction of recorded media | 60 | 3,400 | 24 |
| 34 | Paper and Paper Products | 21 | 775 | 30 |
| 35 | Chemical/Coal/Petro /Plastic Products | 30 | 2,100 | 116 |
| 36 | Non-metallic Mineral Products | 85 | 3,200 | 142 |
| 37 | Basic Metals Industry | 6 | 375 | 40 |
| 38 | Fabrication of Machinery and Equipment | 40 | 2,275 | 53 |
| 39 | Other Manufacturing Industries | 163 | 8,175 | 151 |
| | Mining and Extraction (Coal/Oil/Natural/Gas/ Minerals/Metals) | N/A | N/A | N/A |
| | Electric Generation | 7 | 2,980 | 250 |
| | Dry Cleaning | 1 | 50 | NA |
| TOTAL | | | 98,280 | 2,966 |

¹ ISIC: International Standard Industrial Classification of all Economic Activities, OECD. *The figures in the table concern only large establishments (CSO, 2007). ** It was not possible to get the major emissions for each industrial sector/description, however Table 4.15 gives the overall emissions of greenhouse gases in Mauritius (CSO, 2007).

Source: CSO 2007

Table 4.15: Inventory of greenhouse gases by sources categories for Mauritius for 2005

| Category (unit: Gg or 10 ¹² g) | CO ₂ | CH ₄ | N ₂ O | NO _x (x = 1, 2) | CO | NMVOC* | SO ₂ |
|---|-----------------|-----------------|------------------|----------------------------|------|--------|-----------------|
| 1. Energy | 2,994.0 | 0.5 | 0.1 | 15.4 | 66.4 | 8.6 | 33.0 |
| Fuel Combustion activities | | | | | | | |
| (a) Energy industries (electricity) | 1615.2 | 0.3 | 0.1 | 5.6 | 8.8 | 0.5 | 24.9 |
| (b) Manufacturing industries | 346.3 | 0.1 | 0.0 | 1.3 | 15.6 | 0.2 | 6.4 |
| (c) Transport | 833.7 | 0.1 | - | 8.3 | 40.4 | 7.7 | 2.0 |
| (d) Other sectors | 198.8 | - | - | 0.2 | 1.6 | 0.2 | 0.1 |
| 2. Industrial processes | 2.0 | - | 0.0 | 0.0 | - | 9.7 | - |
| 3. Solvent and other product use | - | - | - | - | - | - | - |
| 4. Agriculture | - | 1.1 | 1.2 | - | - | - | - |
| 5. Land use and forestry | | | | | | | |
| 6. Waste | - | 10.8 | - | - | - | - | - |
| Total | 2,996.0 | 12.5 | 1.3 | 15.4 | 66.4 | 18.3 | 33.0 |

*Non-methane volatile organic compound

Source: CSO 2007

4.2 Production of Chemicals

Mauritius does not mine, produce or manufacture any raw chemicals. All the chemicals that are needed by the various economic sectors of Mauritius are imported, mainly from South Africa, France and United Kingdom.

However, Mauritius produces sugar and ethanol from sugar cane and Table 4.16 indicates the quantity of the two chemical products produced for the year 2005.

Table 4.16: Quantity of sugar and ethanol produced in Mauritius in 2005

| Chemicals Produced | Units | Annual Amount |
|--------------------|-----------------|---------------|
| Sugar | Tons | 519,816 |
| Ethanol | Million gallons | 3 |

Source: CSO, 2007

4.3 Chemical Imports

As stated in the previous paragraph, Mauritius does not produce or manufacture raw chemicals. For this reason, all chemicals used in the different sectors of the economy of the country are imported. For the year 2005, chemicals worth about US\$ 397, 175, 000 have been imported from around the world (CSO, 2007). Both raw and processed chemicals are imported as seen on Table 4.17 below that gives data for the year 2005.

The Dangerous Chemical Control Board (DCCB) strictly controls the imports of chemicals and chemical products in Mauritius. Under the Dangerous Chemical Control

Act, the various companies, suppliers and distributors need to get a permit from the DCCB before being allowed to import chemicals and chemical products into Mauritius.

Below are some of the main importers of chemicals and chemical products:

- Cement: Holcim (Mauritius) Ltd and Lafarge (Mauritius) Cement Ltd.
- Petroleum products: Caltex Oil Mauritius Ltd, Galana Raffinerie et Terminal Co Ltd, Shell Mauritius Limited.
- Textile chemicals are mainly imported by the textile companies but also through local suppliers namely: Atex Ltd, Dynachem Ltd, Wash and Dry Services Ltd.
- Chemical products: Belzim Estate, Cernol Chemicals Ltd, Genserve International Ltd, Suiko & Co. Ltd, AMRO CHEMICALS and Chemco Ltd. These companies also refine, blend and transform these chemical products into other forms for the local market and for re-exportation.
- Processing of fertilizers: Bordie Island Fertilizers Ltd and Mauritius Chemical & Fertilizer Industry Ltd are the main blending industries in Mauritius.
- Suppliers of fertilizers: IBL Agro Chemicals, Kripcen Agro Chemicals Ltd and Roger Fayd'Herbe & Co. Ltd

Table 4.16: Chemical import for Mauritius for 2005

| Petroleum Products | Units | Amount |
|---|----------------|----------------|
| Additives | Tons | 19.5 |
| Bitumen based | Tons | 10, 021 |
| Fuel | Litres | 712, 230, 070 |
| Jet fuel | Tons | 235, 965 |
| Petrol based | Tons | 10, 602 |
| Lubricants | Tons | 171.5 |
| | | |
| Industrial Chemicals | Units | Amount |
| Health Care | Tons | 3, 297 |
| Medical (Solid) | Tons | 3, 659 |
| Medical (Liquid) | L | 1, 000 |
| Textile | Tons | 5, 571 |
| Food (Solid) | Tons | 3, 739 |
| Food (Liquid) | L | 5, 595, 646 |
| Other (Manufacturing, Paints, Chemical, etc.) | Tons | 1, 437, 957 |
| Other (Liquid) | L | 123, 452, 594 |
| | | |
| Agricultural Chemicals | Units | Amounts |
| Fertilizers | Tons | 61,605 |
| Insecticides | Tons | 1, 275 |
| Fungicides | Tons | 188 |
| Herbicides | Tons | 909 |
| | | |
| Consumer chemicals | Units | Amounts |
| Cements | Tons | 667, 723 |
| Gases (Hydrogen, Oxygen) | M ³ | 40 |
| Solid forms | Tons | 36 |
| | | |
| Other Chemicals | Units | Amounts |
| Solid | Tons | 2.5 |
| Liquid | L | 96 |
| Gases (Argon, Nitrogen, Oxygen, Rare gases) | M ³ | 15 |

Source: CSO, 2007

4.4 Chemical exports

Mauritius practically does not export raw chemicals since there is no local production or manufacturing of chemicals. In fact, Mauritius imports raw materials / chemicals and then these are blended and processed into either semi- finished products or finished products and are re-exported towards European and African countries mainly. These include: soap, cleansing and polishing preparations, medicaments, pigments paints, varnishes and fertilizers as reported in Table 4.17 for the year 2005 (CSO, 2007). Note

that for some of the products in Table 4.17, the raw materials are found locally for example for the item stone, sand and gravel.

Table 4.17: Exports of goods involving chemicals for 2005

| Petroleum products | Units | Amount |
|------------------------------------|--------------|---------------|
| Diesel | Tons | 136, 792 |
| Aviation fuel | Tons | 100, 745 |
| Fuel oil | Tons | 52, 558 |
| | | |
| Agricultural products | Units | Amount |
| Margarine products | Tons | 1,851 |
| Beverage (Alcoholic non-alcoholic) | L | 206,757, 394 |
| Undenatured ethyl alcohol | L | 39, 371, 674 |
| | | |
| Industrial Products | Units | Amount |
| Sugar and sugar Products | US\$ '000 | 350, 302 |
| Health care / Medical | US\$ '000 | 11,036 |
| Paint/ Pigments and derivatives | US\$ '000 | 4, 345 |
| Food Products | US\$ '000 | 4, 602 |
| Cement | US\$ '000 | 1, 896 |
| Miscellaneous chemicals | US\$ '000 | 6,350 |

Source: CSO, 2007

Some major companies exporting or re-exporting chemical products are as follows:

- **Detergent manufacturers:** AMCO Ltd., Best Chem Company Ltd., Blychem, Chemlog Ltd., Nexochem Trading Ltd., Nidomac & Co, Ltd., Quality Chemicals Ltd.
- **Dyes and chemicals:** Deramann Ltd., Impacta Ltd., Mauvilac Chemicals Ltd., Rudolf Chemicals (Pty) Ltd.
- **Fertilizer manufacturer:** Bordie, Island Fertilizers Ltd., Mauritius Chemical & Fertilizer Industry Ltd.
- **Agro chemicals:** IBL Agro Chemicals Kirsh Co. Ltd., Kripchen Agro Chemicals Ltd., Roger Fayd'Herbe & Co. Ltd.

4.5 Chemical consumption

Consumption of chemicals in Mauritius is either in terms of finished or semi-finished products. As expected, the industrial sector is the biggest consumer of chemicals, particularly the construction, followed by the manufacturing sector. The major industries using chemicals are the manufacturing, construction and food sectors as seen in Table 4.18 that gives data for 2006 (CSO, 2007).

Chemicals are mostly imported in concentrated forms and most of them are re-processed and/or blended into others and into much lower concentrations for consumption in both the industrial sector as well as into other sectors.

Table 4.18: Chemical consumption by sector for 2006

| Sector | Amount (Tons) |
|----------------------|----------------------|
| Manufacturing | 326,208.2 |
| Dye House | 7,609 |
| Agriculture | 8,122 |
| Construction | 718,081 |
| Food | 41,417 |
| Medicine | 3,786 |
| Paint, Ink & Varnish | 1,256 |
| Cosmetics | 3,027 |
| Cleaning Products | 5,485 |

Source CSO 2007

Table 4.19 gives the distribution of fossil fuels including coal used by the different economic sectors in Mauritius for the year 2005 (CSO, 2007). As expected, the manufacturing and transport sectors are the two major consumers.

Table 4.19: Consumption of petroleum products by different sectors for 2005

| Sector | Units | Amount |
|--|--------------|----------------|
| Manufacturing | | |
| Fuel Oil | Tons | 46763 |
| Diesel Oil | Tons | 41127 |
| LPG | Tons | 3904 |
| Coal | Tons | 23162 |
| Total | | 114,956 |
| Transport | | |
| Gasoline | Tons | 92673 |
| LPG | Tons | 6726 |
| Diesel Oil | Tons | 166510 |
| Aviation fuel (local) | Tons | 137560 |
| Total | | 403,469 |
| Household | | |
| Kerosene | Tons | 9765 |
| LPG | Tons | 43206 |
| Total | | 52,971 |
| Commercial and Distributive trade | | |
| LPG | Tons | 6985 |
| Charcoal | Tons | 380 |
| Total | | 7,365 |
| Agriculture | | |
| Diesel Oil | Tons | 2,345 |

Source: CSO 2007

4.6 Production of wastes (General and Hazardous)

The Ministry of Local Government is the regulatory authority responsible for setting policy and practice in solid waste and hazardous waste management.

The Ministry is responsible for:

- Implementing the hazardous waste regulations 2001;
- The collection and disposal of waste;
- Operation and management of waste management sites;
- Making arrangements to ensure compliance with standards.

Solid Waste Management

Solid waste collected from different localities transit through transfer stations, operated by private contractors on behalf of the Ministry of Local Government, where they are

compacted and transported to the Mare Chicose Landfill site for final disposal. The Mare Chicose Landfill, which is currently the only disposal site in the island, and is also operated by a private contractor, Société de Traitement et d'Assainissement des Mascareignes (STAM). The major problem is that at the rate at which solid waste is being generated annually in Mauritius, this landfill will be saturated by 2010.

In general scavenging services are provided by Local Authorities in the areas falling under their respective jurisdictions. However the Ministry of Local Government has up to now been providing such services in certain areas namely, public beaches, Housing Estates, Traffic Centres, Motorways, and some villages etc, through private contractors.

Condemned goods are also disposed at the Mare Chicose Landfill under supervision of the officers of the Ministry. The condemned goods are normally buried in the waste mass early in the morning in the presence of representatives of the Ministry of Local Government, the Ministry of Health and the Generator. A certificate is then issued to the Generator by the Ministry to confirm the final disposal.

Waste Recycling

The level of waste minimization and recycling of household waste is currently very low and only very limited activities for recycling of glass; paper and plastic are carried out. Recently, two companies have been granted licenses to generate compost from green waste that will be sold on the local market. Generally, the existing recycling activities are operated entirely on a commercial basis by the private sector.

Waste Types and Quantities

In terms of the current quantity of Municipal Solid Waste (MSW), the most reliable figures are the quantities registered at the weighbridge of the only landfill in operation at Mare Chicose. In recent years where the landfill has been the only disposal site, the landfill has received a growing amount of waste (CSO, 2007):

- Year 2000: 265,817 tons
- Year 2001: 306,691 tons
- Year 2002: 363,913 tons
- Year 2003: 372,442 tons
- Year 2004: 381,078 tons
- Year 2005: 382,245 tons

Table 4.20 shows the origin of MSW received at Mare Chicose. Note that the time periods follow the contract periods of the landfill operation contract (September to October).

Table 4.20: MSW Quantities Registered at Mare Chicose Landfill and the Origin of the Waste (TS = Transfer Station) (STAM).

| | Oct. 1999 – Sept. 2000 | | Oct. 2000 – Sept. 2001 | | Oct. 2001 – Sept. 2002 | | Oct. 2002 – Sept. 2003 | | Oct. 2003 – Sept. 2004 | |
|-----------------|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|
| | Tons | % | Tons | % | Tons | % | Tons | % | Tons | % |
| Total | 245,682 | 100 | 302,045 | 100 | 346,335 | 100 | 374,185 | 100 | 372,154 | 100 |
| TS La Brasserie | 46,824 | 19 | 50,708 | 17 | 59,967 | 17 | 69,679.8 | 19 | 70,799 | 19 |
| TS Roche Bois | 57,468 | 24 | 75,195 | 25 | 74,399 | 22 | 80,343 | 21 | 89,879 | 24 |
| TS St. Martin | 76,763 | 31 | 88,941 | 29 | 100,050 | 29 | 108,003 | 12 | 107,897 | 29 |
| TS Poudre D'Or | 15,185 | 6 | 36,095 | 12 | 41,057 | 12 | 45,961 | 29 | 46,410 | 13 |
| Direct supply | 49,442 | 20 | 51,106 | 17 | 70,862 | 20 | 70,199 | 19 | 57,169 | 15 |

Note: TS = Transfer Station

Source: Carlbros report and CSO 2007

The breakdown of different types of wastes generated in Mauritius and landfilled at Mare Chicose from 1999 to 2004 is given in Table 4.21. However, it is necessary to make corrections to figures in Table 4.21 to take into consideration other types of wastes as all wastes received via the four transfer stations are registered as domestic waste at the Mare Chicose Landfill site.

Table 4.21: Types of waste received at Mare Chicose Landfill (STAM).

| | Oct. 1999 – Sept. 2000 | | Oct. 2000 – Sept. 2001 | | Oct. 2001 – Sept. 2002 | | Oct 2002-Sept 2003 | | Oct 2003-Sept 2004 | |
|-------------------------------|------------------------|-----|------------------------|-----|------------------------|-----|--------------------|-----|--------------------|-----|
| | Tons | % | Tons | % | Tons | % | Tons | % | Tons | % |
| Total | 245,682 | 100 | 346,335 | 100 | 302,045 | 100 | 374,185 | 100 | 372,154 | 100 |
| Domestic waste | 230,706 | 94 | 313,783 | 91 | 288,100 | 96 | 351,104 | 94 | 356,892 | 96 |
| Industrial & commercial waste | 7,419 | 3 | 28,287 | 8 | 10,155 | 3 | 4,581 | 1 | 3,497 | 1 |
| Construction waste | 7,555 | 3 | 4,079 | 1 | 3,790 | 1 | 8,949 | 2 | 4,766 | 1 |
| Sludge | 0 | 0 | 114 | 0 | 0 | 0 | 96 | 0 | 166 | 0 |
| Non-MSW types | 2 | 0 | 72 | 0 | 0 | 0 | 9,459* | 3 | 6,833** | 2 |

*Note: Non MSW types include the following wastes in tons: Poultry- 3170.5 Rubber-259.9, cyclonic waste 3199, condemned goods 2758 and asbestos 66. **Non MSW types include the following wastes in tons: Poultry- 3,739, Rubber-483, cyclonic wastes 669, condemned goods- 1,896, hazardous wastes -15.5, Asbestos- 30.4.

Source: Carlbros Report and CSO2007

Table 4.22 gives the amount and projected amount of sewage sludge generated for the period 2004 – 2020 by the three operating wastewater treatment plants, which are under the responsibility of the Wastewater Management Authority.

Table 4.22: Quantities of Sewage Sludge from Wastewater Treatment Plants operated by the Wastewater Management Authority for the Period 2004-2020* (assuming a density of 1 ton per m³).

| Project | 2004 | 2005-2006 | 2007-2009 | 2010-2012 | 2013-2014 | 2015-2019 | 2020+ |
|------------------------------|-------|-----------|-----------|-----------|-----------|-----------|--------|
| Montagne Jacqout | - | 68 | 68 | 68 | 85 | 85 | 85 |
| St. Martin | 22 | 22 | 43 | 72 | 72 | 72 | 101 |
| Grand Baie | - | 12 | 12 | 12 | 12 | 23 | 23 |
| Total m ³ per day | 22 | 102 | 123 | 152 | 169 | 180 | 209 |
| Total tons per year | 8,030 | 37,230 | 44,895 | 55,480 | 61,685 | 65,700 | 76,285 |

*Source: Carlbros Report (MoLG, 2004)

Municipal Waste Management Costs

According to MoLG the public costs incurred in waste management for the year 2004-05 are given in Table 4.23. The above total cost corresponds to MUR 393 (USD 12.3) per capita or MUR 1,540 (USD 48.1) per average household (Budgeted in 2004-5). The collection costs per household were MUR 667 (USD 20.8). (2003). Note that the cost of transfer stations constituted 70% of the disposal costs.

Table 4.23: Breakdown of costs for waste management in Mauritius for 2004 - 2005

| | | |
|---|-----|----------------|
| Implementation of Solid Waste Disposal Strategy | MUR | 130.0 millions |
| Cleaning of beaches and collection of the waste | MUR | 82.4 millions |
| Refuse Collection | MUR | 35.4 millions |
| Operation of transfer stations | MUR | 69.5 millions |
| Operation of Mare Chicose | MUR | 113.4 millions |
| Consumables and other recurrent items | MUR | 3.3 millions |
| Salaries and other staff costs | MUR | 370 millions |
| Total | MUR | 471.0 millions |

Note: 1 USD = 32 MUR

Source: Carlbros Report and CSO 2007

Hazardous Waste in Mauritius

The legislation concerning hazardous waste management is governed under the Environmental Protection Act 2002, Act No. 19 of 2002 passed by the National Assembly on 28 May 2002. This act is an umbrella act dealing with all aspects of environmental protection and waste management. In 1992, Mauritius ratified the Basel and Bamako Conventions on the control of trans-boundary movements and management of hazardous waste and the ban of the import into Africa of hazardous waste. (Refer to Section 6.0)

Hazardous Waste Management

The Ministry of Local Government is the Enforcing Agency with to regards hazardous waste. The Environmental Protection (standards for Hazardous Waste) Regulations make provision, amongst others, for hazardous waste generators to:

- Make an inventory of the hazardous waste they generate as per the Regulations;
- Report on the above inventory on a quarterly basis to the Enforcing Agency;
- Seek approval from the Ministry of Local Government for the use of any store, warehouse or other premises for the storage of a container or package containing hazardous waste within their premises;
- Classify, pack and label their hazardous waste as prescribed in the Regulations;
- Fill in the consignment notes whether the hazardous waste generate leave their premises for disposal.

Moreover, following concern raised in different industrial sectors over the possible health risks associated with the use of asbestos and the presence of asbestos - containing materials in buildings and factories, the government developed a National Action Plan on Asbestos in October 2002.

Other key players in hazardous waste management include:

- The Ministry of Health & Quality of Life for chemicals with potential adverse effect on health;
- The Ministry of Agro Industry & Fisheries responsible for activities that utilize land and natural resources as well as the quality of food. This includes monitoring and assessment of pesticides;
- The Ministry of Industry, Small and Medium Enterprises, Commerce and Cooperatives is responsible for the control of import of products subject to import permits, mainly for health and environmental purposes;
- Ministry of Public Infrastructure, Land Transport & Shipping that holds the responsibility for regulating transport and shipping activities.

There are also several industry-based organizations that play a role in improving and developing hazardous waste management such the Export Processing Zone's Development Authority (EPZDA) covering many small and medium size enterprises.

Current hazardous waste management practices in Mauritius

Although the regulations exist for the management of hazardous wastes in Mauritius (see section 5), up to now, a number of different practices have been occurring in Mauritius such as:

- Solid hazardous wastes are not collected separately but discharged with non-hazardous wastes;
- Liquid hazardous waste is discharged with the sewage water or disposed of to the environment;
- Some hazardous waste is stored at the premises of the industry due to the lack of disposal facilities;
- In hospitals, hazardous waste is collected separately and incinerated in industrial incinerators;

- Internal collection systems of waste generators do not meet the requirements for safe handling and disposal of hazardous waste;
- A very small quantity of hazardous waste is disposed of at the hazardous waste cell at the MSW landfill at Mare Chicose.

The MoLG is fully aware that improvements are needed and various actions are taken in this respect. Workshops on hazardous waste regulations have been held; guidelines on the regulations have been posted on the Ministry's web site; and the Ministry has prepared draft guidelines on hazardous waste management. Furthermore, a Hazardous Waste Management Information System is currently being developed at the MoLG whereby a database of hazardous waste generators with corresponding waste streams and quantities will be established. Although some communication with the industry has taken place the data available are limited and the quantities of hazardous waste currently registered are very small. The impression is that industry does not fully comply with the legal requirement for quarterly reporting and this hampers the effective development of the database. However, according to information gathered from MoLG, most industries are keeping the hazardous wastes, essentially expired chemicals, they are generating until the construction of an interim hazardous waste facility that will start in 2008 and will be operational by 2010.

Hazardous Waste Disposal

The only existing possibility for hazardous waste disposal is offered at the dedicated landfill cell at Mare Chicose landfill site. This cell is equipped with a double composite liner consisting of HDPE and clay liners and the cell has a volume of around 7,500 m³. Hazardous wastes that could lead to leaching of toxic components are not accepted at the landfill without pre-treatment. For example, expired solid products are only accepted if encapsulated in impermeable material. Liquid hazardous waste with water content higher than 70%, as well as acids, pesticides, biocides, chemical and petroleum based wastes, are not accepted at the landfill site. In practice, the Ministry of Local Government (MoLG) recommends that the producers of hazardous liquid wastes and other hazardous wastes that are not accepted at Mare Chicose to properly store these wastes at their premises until adequate facilities are set up to manage. The MoLG is planning to construct an interim hazardous waste facility that will be operational by 2010 and will accept all hazardous wastes including those that are now being stored in the premises of industries.

Table 4.25 gives the amounts of hazardous waste and asbestos waste that was received at the landfill at Mare Chicose for the period 1999 – 2004 (data obtained from STAM). These figures that are very low do not tally (see Section 4) with the considerable amount of chemicals imported and used by the different economic sectors of Mauritius. However, as recommended by MoLG significant amounts of hazardous wastes are being stored by the industries producing them as no space or facility exist at Mare Chicose. Moreover, with regards to asbestos, one of the prohibited industrial chemicals listed in the DCC Act 2004, the situation is under control. All the asbestos wastes given in Table 4.25 were generated in the context of the National Action Plan on asbestos developed in 2002.

Companies that were using asbestos started to replace it by non-toxic materials (e.g. glass fibre). This replacement exercise will continue until all asbestos has been completely phased out in Mauritius.

In the context of enabling activities for the development of the National Implementation Plan for the management of POPs in Mauritius, inventories carried out allowed the identification of the following (MoE, NIP, 2005):

- Four transformers containing PCB at levels greater than 50 ppm under the responsibility of the Central Electricity Board (CEB)
- 116 tons of DDT under the responsibility of the Ministry of Health and Quality of life
- 8 litres of dieldrin at MSIRI
- 64 kg of mirex at Roger Fayd'herbe, a company importing and distributing pesticides
- 13 litres of aldrin at the Deep River Beau Champ sugar estate

Currently, the Ministry of Environment is developing a Medium Size Project (MSP) jointly with the UNDP, Mauritius to implement one of the priorities of the NIP, which is to properly manage POPs and POPs wastes identified during the inventories. The MSP will also cater for the remediation of soil highly contaminated by DDT near storage facilities belonging to the MoH.

Table 4.24: Hazardous and Asbestos Waste Received at Mare Chicose landfill site

| | October 1999 – September 2000 (tons) | October 2000 – September 2001 (tons) | October 2001 September 2002 (tons) | October 2002- September 2003 (tons) | October 2003- September 2004 (tons) |
|-----------------|--|--|--|---|---|
| Hazardous waste | No information | 7 drums: about 1.2 tons | 0.44 | 2.18 | 19.98 |
| Asbestos waste | 1.66 | No information | 71.86 | 65.89 | 30.44 |

Source: Carlbro Report and CSO 2007

Hazardous Waste Import/ Export

There is no record of any hazardous waste import or export for Mauritius according to the Basel Convention Secretariat. Attempts have been made in the past to export consignments of used batteries and obsolete pesticides, but these did not take place. During the Carlbro Consultant's (MoLG, 2004) visits to waste generators information was received that a few types of hazardous wastes actually had been exported for recycling. The lack of registration and reporting will have to be enforced by the MoLG in order to monitor quantities and flow of hazardous waste.

Hazardous Waste Types and Quantities

A number of projects and informal studies carried out in the local context give an indication of hazardous waste generated in Mauritius. For example, a national survey carried out in 1999 by Fichtner (MoLG, 1999) indicated that the amounts of hazardous waste could represent as much as 5 to 6% of the total amount of waste generated at the island (Table 4.25) (MoLG, 2000).

Table 4.25: Hazardous Waste Reported

| Source / Type of Hazardous Waste | Quantities 1999 |
|---|-----------------------|
| Industrial waste | |
| Liquids | 200 m ³ /a |
| Sludge | 200 m ³ /a |
| Solids | 500 t/a |
| Used oil waste (collection rate 70%) | 3,600 t/a |
| Harbour waste, contaminated liquids | 13,000 t/a |
| Clinical waste | 192 t/a |
| From Mauritius | 184 t/a |
| From Rodrigues | 8 t/a |
| Problematic waste from households, commercial and tourist areas (total) | 1,100 t/a |
| Collected quantities (approximately 50% of total quantities) | 500 t/a |

Source: MoLG, 2000

Another study carried out by Carlbro and partners on behalf of the Ministry of Local Government in 2004 indicated that between 4,400 tons and 22,600 tons of hazardous wastes would be generated annually by the various economic sectors in Mauritius (MoLG, 2004). Given the changes that are occurring in the economy in Mauritius, some figures in Table 4.26, taken from the Carlbro report, need to be readjusted. For example, while a number of textile companies are closing down, the ICT sector is rapidly developing and a seafood hub has just been created.

Table 4.26: Hazardous wastes estimation for 2004

| Type of Company / Institution | Type of Waste | Waste Amount Min/Average/Max (tons/year) | Number of Staff | Expected Treatment Method |
|-------------------------------|--|--|-----------------|---------------------------|
| Agriculture | Pesticides Laboratory waste | 70 (obsolete) 0.1 / 0.3 / 0.5 | 30 | Incineration |
| Chemicals and Detergents | Sewage from WWTP | 5 / 8 / 12 | 89 | Incineration |
| Port Activities | Oil sludge, lubricating oil and slops. | 1,000 / 2,000 / 5,000 | 500 | Incineration |
| Paint Industry | Sludge from WWTP | 2 / 10 / 12 | 8 | Incineration |
| Electronic Industry | Electronic scrap, flux | 0.1 / 0.2 / 0.3 | 55 | Incineration |
| Laboratories | Laboratory waste, Contaminated water | 1 / 3 / 6 | 24 | PCT* |

| Type of Company / Institution | Type of Waste | Waste Amount Min/Average/Max (tons/year) | Number of Staff | Expected Treatment Method |
|--|---|---|-----------------|---------------------------|
| Pharmaceutical Industry | Contaminated packaging, Lab. Waste Cleaning water | 10 / 20 / 25 (1 ton of solids) | 50 | Incineration |
| Dry Cleaning Industry | Waste from dry cleaning (containing per- and trichlor) | 7 / 12 / 15 | 60 | Incineration |
| Metal Surface Industry | HCl containing Iron Rinse water containing HCl and Iron | 3,500 / 4,500 / 5,000 ¹⁾ (420 tons sludge) | 80 | PCT (LF) |
| Agriculture | Herbicides packaging | 0.5 / 1 / 1.5 | 1,200 | Incineration |
| Chemicals | Import, distribution of raw base chemicals | 15 (obsolete) 0.1 / 0.2 / 0.3 | 16 | PCT |
| Leather Industry | Waste water from tanning operation Chromium liquids | 300 / 400 / 1,000 (0.5 tons sludge) | 18 | PCT (LF) |
| Textile Industry | Obsolete Dye chemicals | 0.5 / 1 / 3 | 550 | Incineration |
| Photographic Industry | Photo chemicals | 100 / 120 / 150 | 75 | Incineration |
| Oil Industry | Lubrication oil (excluding ships) | 2,000 / 2,900 / 4,800 | - | Incineration |
| Landfill | Asbestos waste | 50 / 200 / 3,000 | - | Landfill |
| Hazardous waste included in household waste | Various | 500 / 2,400 / 3,600 | - | Incineration |
| Total | | 4,400 / 8,500 / 22,600 | 2,800 | |

*PCT: Physico-Chemical Treatment

Source: MoLG, 2004

5. Basic national set up of management of the environment

In Mauritius, the Environmental Protection Act legislated in 2002 (EPA 2002), which repealed the previous EPA 1999, provides the main legal framework and the mechanism to protect the natural environment, develop plans for environmental management, coordinate inter-relations on environmental issues to ensure the proper implementation of government policies and enforcement provisions. The major provisions set out in EPA 2002 include the following:

- The concept of environmental stewardship;
- The requirement for environmental impact assessments for major scheduled undertakings;
- The establishment of Standards and Guidelines in respect of air, water, noise, effluent, waste, including hazardous waste and pesticides residues in raw food commodities;
- The protection of natural resources and biodiversity conservation;
- The duty to report to the Director of Environment and to take prompt actions when accidental spills of a pollutant occurs;
- The establishment of liabilities regarding environmental quality rehabilitation;
- The responsibilities of the various enforcing agencies in the enforcement of environmental laws.

The EPA 2002 also provides, under Section 42, for the Minister of Environment to make regulations for the “licensing of waste disposal sites, wastes management systems and other facilities relating to the disposal of hazardous wastes in an environmentally sound manner.” The Environment Protection (Standards for Hazardous Wastes) Regulations promulgated in April 2002 aim at exercising control on the import, export, collection, on-site treatment, transportation and disposal of a hazardous wastes. As given in the NIP document (MoE, NIP, 2005), the overall environmental management in Mauritius may be resumed in the box below.

OVERALL ENVIRONMENTAL MANAGEMENT ³

Ministry of Environment & National Development Unit

Responsibilities

- Department of Environment
- Environmental Quality
- Environmental Information and Awareness

Resource Management

- Land Management – Ministry of Agriculture, Food Technology & Natural Resources (Land Use Division).
- Water Management – Ministry of Public Utilities (Water Resources Unit).
- Air Quality Management – Department of Environment.
- Integrated Coastal Zone Management – Department of Environment.
- Biodiversity – National Parks and Conservation Service (NPCS).

Sector Management

- Integrated Solid Waste Management – Ministry of Local Government
- Industrial Management – Ministry of Industry, Financial Services & Corporate Affairs.
- Tourism Management – Ministry of Tourism, Leisure & External Communications
- Agricultural Management – Ministry of Agro Industry and Fisheries
- Transport Management – Ministry of Public Infrastructure, Land, Transport & Shipping

The enforcing agencies for the different environmental media and some pollutants are listed in Table 5.1 Note that the Ministries of Health and Quality of Life, Agro Industry & Fisheries and Environment have well equipped laboratories for the monitoring of chemicals and pollutants in the different media for which they are the enforcing agencies.

Table 5.1: Enforcing agencies for different environmental media / pollutants⁴

| Medium/Pollutant | Enforcing Agency |
|--|---|
| Noise, quality control of drinking water and odour | Ministry of Health and Quality of Life (MoH) |
| Inland waters and effluents | Ministry of Public Utilities |
| Solid wastes and hazardous wastes | Ministry of Local Government |
| Pesticide residues | Ministry of Agro Industry and Fisheries (MoA) |
| Waters in the zone other than waters in the Port | Ministry of Agro Industry and Fisheries (MoA) |
| Waters in the Port | Port Master |
| Air and any of the above medium or pollutant | Director of Environment (Ministry of Environment) |

On the other hand, the Dangerous Chemicals Control Act 2004 (DCC Act 2004), which falls under the responsibility of the Ministry of Health & Quality of Life (MoH), provides

³ Source : NIP, Mauritius

⁴ Source: NIP, Mauritius

a legal framework for the control of dangerous chemicals to prevent damage to health and to the environment by chemical substances and to provide for better protection of workers, members of the public and the environment. In particular, the Act provides for:

- the establishment of a Council which shall advise the Minister on matters relating to dangerous chemicals;
- better co-ordination and co-operation amongst the law enforcement agencies, government departments and other institutions for the effective control of dangerous chemicals;
- the establishment of an Enforcing Agencies Co-ordination Committee, which will be responsible for ensuring a proper coordination mechanism of activities amongst enforcing agencies;
- dangerous chemicals to be classified, labelled and marketed in accordance with prescribed standards;
- the licensing of persons who are involved in the import, export, manufacture, sale, distribution, trade, transport and storage of dangerous chemicals;
- the mandatory disclosure of information relating to dangerous chemicals;
- the prohibition of the use of certain chemical substances considered to be extremely dangerous;
- better protection of employees exposed to dangerous chemicals at their work place;
- criminal sanctions in case of contraventions of certain provisions of this Act.

Under the DCC Act 2004, different ministries and government departments are assigned the responsibilities for the management of chemicals as enforcing agencies within their respective area of expertise. For proper coordination and collaboration among the various stakeholders, including the private sector, the Act provides for the setting up of the following bodies:

- A Dangerous Chemical Advisory Council to advise the Minister on matters relating to dangerous chemicals;
- A Dangerous Chemical Control Board for registration, classification and labelling of dangerous chemicals in accordance with prescribed standards; as a regulatory body, the Board will adopt policies for sound chemical management throughout its life cycle.

The Chemical Fertilizers Control Act 1980, falling under the responsibility of the Ministry of Agro Industry and Fisheries (MoA), is a specific piece of legislation that regulates the sale and trade of fertilizers in Mauritius.

The Food Act 1998, which also falls under the responsibility of the Ministry of Health & Quality of Life (MoH, 2007), provides for more effective and efficient protection for consumers against those who put our health at risk by dealing with food that is unfit for human consumption and detrimental to public health. It will reduce the current levels of sickness, disability, morbidity resulting from food related diseases and poisoning. The Act, in particular, set the levels of contaminants including organic and inorganic pollutants and pesticide residues that are allowed in food that are imported to, produced, manufactured, stored and sold in Mauritius. Mauritius having ratified the Stockholm

Convention, it is recommended that the authorities consider including all twelve POPs in the list of contaminants and their levels in food items set accordingly.

Falling under the responsibility of Ministry of Labour, Industrial Relations and Employment (MoL), the Occupational Safety, Health and Welfare act 1988 (OSHW Act 1988) is a piece of legislation that provides for the protection of employees in their work place. In particular, it provides regulations for the following:

- Dangerous substances
- Explosive, flammable substances
- Dangerous fumes and lack of oxygen
- Corrosive substances
- Prohibited and toxic substances

Table 5.2 below resumes the main pieces of legislation that address the management of chemicals in Mauritius. Note that in the scope of this assignment it was not possible to get information regarding the resources allocated for the enforcement of the different pieces of legislation.

Table 5.2: Existing legal instruments for the management of chemicals in Mauritius

| Legal Instrument | Responsible Ministries or Bodies | Categories Covered | Objective of Legislation** | Enforcement Ranking ¹ |
|---------------------------------------|----------------------------------|------------------------|---|----------------------------------|
| DCC Act 2004 | MoH | All categories | - To control the importation, exportation, production, storage, manufacture, trade, transport and sale of dangerous chemicals and also the disposal of chemical wastes - To prohibit the importation, exportation, production, manufacture, trade and sale of very dangerous chemicals listed in the Eighteenth Schedule | 2 |
| Chemical Fertilizers Control Act 1980 | MoA | Fertilizers | To regulate the sale and trade of fertilizers | 3 |
| Agricultural Chemists Act 1979 | MoA | Agricultural chemicals | For the registration of agricultural chemists and laboratories adequately equipped for the analysis of agricultural chemicals and products | 3 |
| EPA 2002** | MoE | All categories | **To set environmental standards for air, drinking water, effluent discharge, hazardous wastes, and effluents for irrigation. To regulate the manufacture and sale of Polyethylene Terephthalate (PET) bottles and plastic carry bags. To manage used oils | 2 |
| Food Act 1998 | MoH | Chemical pollutants | To set standards in food with regards to chemical pollutants including organic and inorganic substances and pesticide residues | 2* |
| OSHW Act 1988 | MoL | Dangerous Chemicals | To protect the employees at their work place | 2 |
| Radiation Protection Act 1992 | MoH | Radioactive chemicals | To regulate the import, production, processing, handling, use, holding, storage, transport and disposal of natural and artificially produced radioactive substances | 3 |
| The Explosives Act 1959 | Prime Minister's Office | Explosive substances | To regulate the import, production, processing, handling, use, holding, storage, transport and disposal of explosive substances. | 3 |

¹ Enter: Effective (1), fair (2), or weak (3) enforcement. *Note that a Food analytical laboratory has recently been set up and most of chemical pollutants in food will be routinely monitored. ** See below the environmental laws and regulations under EPA 2002 relative to these objectives

Source: Compiled data from CSO and websites

Major environmental laws and regulations under EPA 2002:

- Environment Protection (Standards for Air) Regulations 1998
- Environment Protection (Drinking Water Standards) Regulations 1996
- Environment Protection (Standards for effluent discharge) Regulations 2003
- (Standards for Effluent Discharge) (Amendment) Regulations 2004
- Environment Protection (Standards for effluent discharge into the ocean) Regulations 2003
- Environment Protection (Standards of effluent for use in irrigation) Regulations 2003
- Environment Protection (Standards for hazardous wastes) Regulations 2001
- Environment Protection (Polyethylene Terephthalate (PET) bottle Permit)
- Environment Protection (Plastic Carry Bags) Regulations 2003
- Environment Protection (collection, storage, treatment, use and disposal of used oil) Regulations 2005

Table 5.3 below shows that in Mauritius, all chemicals are adequately addressed by an appropriate legislation throughout their lifecycle. However, due to various reasons such as lack of resources, enforcement of these legislations is weak for some of the stages laid out in Table 5.3.

Table 5.3: Overview of Legal Instruments to Manage Chemicals by Use Category

| Category of Chemical | Import | Production | Storage ² | Transport ² | Distribution/ Marketing | Use/ Handling | Disposal |
|--|--------|------------|----------------------|------------------------|----------------------------|------------------|----------|
| Pesticides (agricultural, public health and consumer use) | X | X | X | X | X | X | X |
| Fertilizers | X | X | X | X | X | X | X |
| Ind. Chemicals (used in manu-facturing/pro-cessing facilities) | X | X | X | X | X | X | X |
| Petroleum Products | X | X | X | X | X | X | X |
| Consumer Chemicals | X | X | X | X | X | X | X |
| Chemical Wastes | X | X | X | X | X | X | X |
| Others | | | | | | | |

¹ If a specific stage is adequately addressed through legislation, an "X" should be filled in;
² It should be recognized that transportation and storage can occur at various stages of the chemicals' life-cycle from production through disposal.

Source: (The information given in Table is according to existing regulations)

The DCC Act 2004 gives the names of 58 industrial chemicals and 73 agricultural chemicals that are listed as "Prohibited Chemicals". According to the Act these prohibited chemicals cannot be imported, manufactured, used or possessed except for research, experiments or as reference sample or exhibit without the written authorization of the Dangerous Chemical Control Board (DCCB). Mauritius having ratified the Stockholm Convention, it is recommended that all 12 POPs should be included in the prohibited list, which is not the case currently. Moreover, provision should be made to include future POPs. The other pieces of legislation namely: EPA 2002, Food Act 1998 and OSHW Act 1988 need also to be revised to include the twelve POPs and future POPs.

6. Status of ratification of the various Chemicals and Waste Conventions

Mauritius has already ratified all chemicals and wastes conventions and for all of them the Ministry of Environment and National Development Unit (MoE) as shown in Table 6.1. (MoE, 2007). Mauritius will foster synergies among these conventions through the Multilateral Environmental Agreement (MEA) Coordinating Committee under the forthcoming amended Environment Protection Act 2002. Note that for the management of Persistent Organic Pollutants (POPs), Mauritius has already submitted its National Implementation Plan (NIP) to the Stockholm Convention secretariat (MoE, NIP, 2005).

Table 6.1: Major Conventions and Protocols to which Mauritius is Party

| Conventions & Protocols | Signed | Ratified | Adhered to /Acceded to | Focal Point |
|--|----------|------------|--|--|
| United Nations Framework Convention on Climate Change <i>Kyoto Protocol</i> | 10.6.92 | 17.8.92 | | MoE |
| Vienna Protocol for the protection of the ozone layer <i>Montreal Protocol on Substances that deplete the ozone layer</i> <i>London Amendment to the Montreal Protocol (1990)</i> <i>Copenhagen Amendment to the Montreal Protocol (1990)</i> <i>Montreal Amendment to the Montreal Protocol (1990)</i> <i>Beijing Amendment to the Montreal Protocol (1990)</i> | | 30.11.93 | 18.8.92 18.8.92 20.10.92 24.03.03 24.03.03 | MoE |
| Basel Convention | | 24.11.92 | | MoE |
| Bamako Convention | | 29.10.92 | | MoE |
| Rotterdam Convention | | In process | | Ministry of Health & Quality of Life (MoH) |
| Stockholm Convention | May 2001 | July 2004 | | MoE |

Source: NIP, Mauritius and Ministry of Environment website

7. Key stakeholders for the study

In this section, only the ministries, companies and other bodies that have responded to the surveys and questionnaires are listed here.

7.1 All key Ministries with their agencies

The key ministries that have been consulted for the study are:

1. Ministry of Environment and National Development Unit
2. Ministry of Health and Quality of Life
3. Represented by the Dangerous Chemicals Control Board (DCCB)
4. Ministry of Local Government (MoLG)
5. Ministry of Labour, Industrial Relations and Employment
6. Ministry of Agro Industry and Fisheries
7. Ministry of Industry, Small and Medium Enterprises, Commerce and Cooperatives
8. Represented by the Mauritius Standards Bureau
9. Ministry of Women's rights, child development, family welfare & Consumer Protection
10. Represented by the Department of Child Protection
11. Ministry of Public Utilities
12. Represented by Central Water Authority (CWA)
13. Mauritius Sugar Industry and Research Institute (MSIRI)
14. Ministry of Education and Human Resources

Note: The MSIRI, which is not a ministry, has been included in the list, as they have contributed to the surveys.

Other concerned ministries that have not participated but that play a role in the lifecycle of chemicals:

- Ministry of Public Infrastructure, Land Transport & Shipping
- Ministry of Justice and Human Rights
- Ministry of Finance and Economic Development
- Ministry of Foreign Affairs, International trade & Cooperation

Roles of the Ministries consulted for the study

1. Ministry of Environment and National Development Unit

The Ministry of Environment and National Development Unit (MOE) has the overall responsibility for the protection of the environment. Under the EPA 2002, it regulates, via standards or guidelines, pollutant limits in different media (particularly air and water), and as residues in raw agricultural commodities (fresh or frozen fruits and vegetables in their raw state, grains, nuts, eggs, raw milk, meat and other agricultural produce), food and animal feeds. The Ministry of Environment also regulates the import, export,

collection, movement, transportation and disposal of hazardous wastes. Obsolete POPs pesticides, used PCB oils and scrapped PCB-containing equipment are therefore controlled under the relevant Regulations made under the EPA.

The EPA 2002 also enables the MOE to control the release of any pollutant, waste or other noxious substances from or through the atmosphere or by dumping in the maritime zones of the Republic of Mauritius. The Environmental Impact Assessment (EIA) mechanism provided under the same Act allows the Ministry to impose conditions on scheduled activities likely to release important pollutants (e.g. from power generation) or potentially dealing with chemicals (e.g. manufacturers of chemical fertilizers, paper, paint, pigment, etc.).

Under the DCC Act 2004, the Ministry of Environment & National Development Unit is the designated enforcing agency in relation to the adverse effects on the environment likely to be caused by dangerous chemicals. The Ministry is also represented in all the coordinating bodies established under the DCC Act.

2. Ministry of Health and Quality of Life - Represented by the Dangerous Chemicals Control Board (DCCB)

The Ministry of Health and Quality of Life (MOH) is the main regulatory body that controls, under the DCC Act 2004, all dangerous and extremely dangerous chemicals - throughout their different stages of life: import, export, transit, production, sale, distribution, transport, storage and disposal. As an enforcing agency under the DCC Act 2004, it is specifically responsible for health effects consequential to accidental, occupational or environmental exposure to dangerous chemicals, medical surveillance and regular medical examinations. The Ministry is also responsible for regular investigation of occupational diseases or work- related diseases following exposure to, or the use of, dangerous chemicals.

The Ministry of Health acts as the main coordinating body with other organisations in the management of dangerous chemicals and provides the secretariat facilities for the functioning of the Dangerous Chemicals Control Board (DCCB) set up under the DCC Act 2004. Through the DCCB, the MOH is responsible for carrying out the following functions:

1. Register all importers, manufacturers, distributors and retailers of dangerous chemicals;
2. Register all chemicals manufactured, imported and sold in Mauritius;
3. Issue licenses for the manufacture, import, export, retailing, transport and storage of chemicals;
4. Issue of permits for the import of highly dangerous chemicals and pesticides;
5. Classify all chemicals according to schedules;
6. Ensure compliance with different sections of the legislations especially on labelling and packaging;

7. Ensure proper coordination among the different enforcing agencies;
8. Prepare guidelines, codes of practice and regulations on dangerous chemicals;
9. Disseminate information on chemicals to the public;
10. Receive notifications on import of dangerous chemicals;
11. Prepare a Register of dangerous chemicals.

Under the Dangerous Chemicals Control (DCC) Act 2004, different ministries and government departments are assigned the responsibilities for the management of chemicals as enforcing agencies within their respective area of expertise.

3. Ministry of Local Government (MoLG)

The Ministry of Local Government (MoLG) is responsible for the management of household and commercial waste from collection, transportation to disposal. Its main functions and responsibilities are:

- Coordinator of the local authorities in accordance with the Local Government Act;
- Responsible for the development/review of solid waste management programmes and policies on:
 - Appropriate waste storage, collection and transfer;
 - Provision of additional disposal facilities;
 - Rehabilitation of closed dumps;
 - Effective institutional framework and legislation;
 - Waste minimization (through composting and recycling).
- Responsible for management of wide variety of environmental issues in relation to:
 - Minimization of waste;
 - Maximization of value derived from waste;
 - Promotion of environmental friendly waste treatment and disposal practices;
 - Licensing of waste carriers vehicles.
 - Disposal of chemical/dangerous wastes under specific terms and conditions.

The Ministry of Local Government and Solid Waste Management is also the designated enforcing agency in relation to the management of solid wastes and hazardous wastes under the EPA 2002. Under the DCC Act 2004, it is mainly responsible for the inspection, information, guidance and control on the collection, storage, transport, treatment and disposal of chemical wastes.

4. Ministry of Labour, Industrial Relations and Employment

The Ministry of Labour, Industrial Relations & Employment (MoL) enforces occupational safety, health and welfare legislations and regulations as provided under the Occupational Safety, Health and Welfare Act (OSHWA) 2005. That Act specifically requires employers to provide information, instruction, training, supervision and arrangements to ensure safety and absence of risks to health in connection with the use, handling, storage and transport of chemicals at all places of work.

Under the DCC Act 2004, the Ministry of Labour is the designated enforcing agency for the following matters:

- Technical and organizational precautions at workplaces;
- Risk analysis and assessment on loss of containment or explosion of dangerous chemicals;
- Accidents caused by dangerous chemicals;
- Internal audits of dangerous chemicals;
- Storage, handling and internal transport of dangerous chemicals.

Furthermore, the Occupational Safety and Health Inspectorate of the Ministry carries out the following functions:

- Conduct inspections, investigate into complaints and prosecute in cases of non-compliance;
- Investigate into cases of workplace accidents, initiate prosecution and/or advises employers on remedial measures to prevent recurrence;
- Disseminate information on occupational safety and health;
- Organize training; and
- Conduct specialized analyses, audits and surveys.

5. Ministry of Agro Industry and Fisheries

The Ministry of Agro Industry and Fisheries, under the Chemical Fertilisers Control Act 1980 and the DCC Act 2004, is responsible for the inspection, information, guidance and control on the proper and safe use of pesticides as well as the control of pesticide residues in vegetables, fruits and other agricultural materials such as soil, livestock feed or fodder.

6. *Ministry of Industry, Small and Medium Enterprises, Commerce and Cooperatives*
Represented by the Mauritius Standards Bureau

The aims and objectives of the Ministry of Industry, Small and Medium Enterprises, Commerce and Cooperatives are to:

- Create a strong, diversified, high value-added and competitive industrial sector
- Encourage development of new and high value-added industrial activities
- Promote investment in the state-of-art production technologies
- Facilitate the industrial development by creating a more conducive business environment
- Consolidate, modernize and integrate the SME sector and encourage its participation in the export business
- Promote, expand and diversify exports for tapping market opportunities at regional and international levels
- Ensure the development of skills and design capabilities, quality upgrading, industrial restructuring and promotion of clusters

Note that the Mauritius Standards Bureau is the body that sets standards regarding goods and products that are imported and manufactured in Mauritius.

7. *Ministry of Women's rights, child development, family welfare & Consumer Protection*
Represented by the Department of Child Protection

The Ministry is mandated to cater for women's rights, child development and family welfare. It has been entrusted the responsibility to design and implement social policies and programmes, which promote women empowerment, child development as well as consolidate and safeguard family welfare. Actions of this ministry are therefore aimed at creating the right conditions and environment for the harmonious development of the Mauritian children, women and their families.

The main objectives of the Ministry are:

- To promote and defend women's rights as human rights, work for the elimination of all forms of discrimination against women and ensure that legal measures are taken to promote equality between men and women
- To implement gender-sensitive macroeconomic policies and strategies, including those related to poverty alleviation
- To promote the development and welfare of children from the very tender age in accordance with the Convention on the Rights of the Child (CRC) and to promote family welfare.

The Child Development Unit has to ensure the development and protection of children in the cohort 0-18 years through the implementation of policies in line with the Convention on the Rights of the Child (CRC) and enforcement of legislation pertaining to children. The Unit has 6 Regional Offices.

8. Ministry of Public Utilities (MPU)
Represented by the Central Water Authority (CWA)

The main activities of the Ministry of Public Utilities (MPU) are the formulation of policies in the energy, water and wastewater sectors and the introduction of legislation as required to fulfil its mission and goals. The Ministry also ensures that services offered by various organisations falling under its purview are delivered in the best interests of the public.

The objectives of the MPU are to provide a 24-hour water and energy supply while maximizing the use and benefits of renewable local sources of energy. It also aims at extending the wastewater network island wide. The Ministry has under its responsibility the Central Water Authority (CWA), the Central Electricity Board (CEB), the Wastewater Management Authority (WMA), the Water Resources Unit and the Energy Services Division (ESD).

The Central Water Authority (CWA) is the body that is responsible for the management of drinking water in Mauritius. According to its website, its mission is:

To secure and provide a sustainable water supply service of appropriate quality at an affordable price which meets the growing needs of the people and to support the economic development of the country.

And its objectives are:

- *Guarantee the quality of drinking water.*
- *Excel in service delivery so as to meet the increasing demand with a good round the clock service.*
- *Improve and manage our corporate image in an efficient manner.*
- *Reduce and maintain non-revenue water to an economically acceptable level by improving our network's efficiency.*
- *Operate our services in a cost-effective manner and consolidate our financial viability.*

9. Mauritius Sugar Industry and Research Institute (MSIRI)

To fulfil its research and development programme, the Mauritius Sugar Industry Research Institute (MSIRI) performs a broad range of measurements including analyses on soils, plants, waters, agricultural materials and environmental samples. To this end, it

imports a wide range of analytical reagents but none of them falls within the group of POPs. In fact, the only POPs used are the reference standards for POPs analysis, which are imported in microgram quantities only.

The role of the MSIRI with respect to chemical management is therefore restricted to non-POP substances. Moreover, in formulating recommendations for fertilizers and pesticides, particularly herbicides, the MSIRI plays a major role in the judicious use of agro-chemicals both in the sugar cane cultivation and food crop production while minimizing their impact on the environment.

The main objectives of the MSIRI with respect to chemical management are:

1. To develop the best management practices for agro-chemical use in sugar-cane and food crop production such that any environmental and health impacts are reduced to a minimum;
2. To ensure a readily available supply of analytical reagents for the purpose of carrying out research work. While achieving this objective, the general rules of proper storage and stock management are observed such as:
 - The location of chemical stores in separate buildings with adequate ventilation and emergency equipment;
 - Authorized access to chemical stores;
 - Yearly importation of chemicals so as to avoid old stocks;
 - Use of chemicals on a 'first in-first out' principle is strictly adhered to in order to avoid any accident or the use of expired products, among others.

10. Ministry of Education and Human Resources

The Ministry of Education is responsible for providing education and training to all the citizens of Mauritius.

Note:

For a more complete representation of the stakeholders' views, the ***Customs and Excise Department*** and the ***Wastewater Management Authority*** should have been solicited. However, for various reasons it was not possible to get their views.

The ***Customs and Excise Department***, has the duty to check the nature and amount of dangerous chemicals imported, exported and on transit in the country. It is also responsible for the exchange of computerized information relating to the importation and exportation of dangerous chemicals.

The ***Wastewater Management Authority*** (WMA) is responsible for the control of effluents including sewage. It has a general regulatory function concerning wastewater disposal and is an enforcing agency with the power to issue enforcement notices. The WMA operates and maintains all sewerage infrastructures and collects wastewater charges from properties connected to the public sewerage system. Furthermore, the

WMA, as per Government Notice No 182 of 2004, also regulates Wastewater Standards for discharge of industrial effluents into the wastewater system.

7.2 Category 2: Local authorities and Non-Government Organizations

Municipalities and district councils

In Mauritius there exist two types of local authorities: Municipal and District Councils (see Table 8 Section 4.1.2.2 for the list). The duties and responsibilities of the local authorities are given in Section 4.1.2.2.

7.3 Key Industrial and Agricultural Associations

The Mauritius Chamber of Agriculture⁵ and the Sugar Producers Association are two major associations in Mauritius in the agricultural sector. The Mauritius Chamber of Agriculture (MCA) provides a high-level forum for an exchange of ideas and views and for the formulation of general policies and strategies on all major issues pertaining to the development of agriculture and agricultural industries. The major stakeholders (sugar, tea and other crop producers) involved in agriculture in Mauritius are members of the MCA. Only the Mauritius chamber of agriculture was contacted for the surveys / questionnaires.

7.4 Chemical manufacturers

As stated in Section 4.2, Mauritius does not produce raw chemicals. All the chemicals that are used in the different sectors of the economy are imported, which are then blended and processed into either semi- finished products or finished products and then sold locally or re-exported.

Mauvillac and Sofap are two companies manufacturing paints. Only Mauvillac Co Ltd, manufacturer of paint, and Cernol, manufacturer of detergents soaps and related products, were contacted for the study, other major chemical manufacturers are:

- Mauritius Chemical Fertilizer Industry (**MCFI**) is a company that imports fertilizers.
- **Alcodis** is a company that produces alcohol from molasses.

7.5 Chemical importers

Ducray le Noir, which is a major chemical importer, was contacted for the survey regarding risk analysis. **Ducray Lenoir** is a company that imports chemicals, laboratory and hospital equipment Please see Section 4.3 for the names of some other major chemical importers.

⁵ Contact (<http://www.mchagric.org/>)

7.6 Chemical exporters

Cernol Ltd, which a major chemical exporter, was contacted for the study. **Cernol** exports finished products like detergents, soap, shampoo... Please see Section 4.4 for the names of some other chemical exporters.

7.7 Chemical consumers

A Senior Laboratory Technician from the University of Mauritius was contacted to participate in the risk analysis survey.

7.8 NGOs –(Environmental), women associations, and those supporting children

The Chemical Engineering Society was contacted to participate in the risk analysis survey. It is an association of students (studying Chemical Engineering at the University of Mauritius) and Chemical Engineers (who graduated from University of Mauritius)

7.9 Trade unions (-covering Agricultural and Industrial sectors)

The Association Consomateurs de l’Ile Maurice (ACIM) was contacted to participate in the study but did not respond to our various emails. ACIM is a consumers association that protects consumers’ rights in Mauritius.

7.10 Law enforcement agencies (customs etc)

The different enforcement law agencies together with their responsibilities are given in Section 5.

The ***Police de l’Environnement***, a unit constituted by seconded Police Officers from the Police Force and that provides assistance to the Director on enforcement of environmental laws, was contacted for the survey on risk analysis.

Under the DCC Act 2004, the Police Force has responsibilities for the transport on public roads of dangerous chemicals and wastes. It is also responsible for the training of drivers involved in the transportation of dangerous chemicals. The Police is also required to set an emergency planning and preparedness plan relating to accidents that may arise from the use, manipulation or storage of dangerous chemicals. Furthermore, it is its duty to organize rescue activities following an accident relating to the use, manipulation or storage of dangerous chemicals. The Police Force is also required to contribute in the dissemination of relevant information to the public.

7.11 Academia and Centres of excellence (Research and Teaching) and National Cleaner Production centres

An academic from the University of Mauritius participated in the study.

7.12 The Media (Electronic and print covering environmental issues)

The Mauritius Broadcasting Corporation (MBC) was contacted to participate in the study. MBC is the main radio and TV broadcasting body in Mauritius

8. Situation analysis for the key areas within SAICM⁶

A list of the different ministries and their departments in Mauritius was obtained from the government website. Ten main stakeholders were short listed for the survey exercise in the category of “Ministries and their agencies” as set out by the proposed outline of the baseline report from the BCRC.

One municipal council out of the five municipal councils and one district council out of four was contacted for the survey under the category of “local authorities”. One representative under each category 3 –12 was contacted for the study. However no response was obtained from the representative of the trade union.

Face to face interviews were conducted for major stakeholders such as for the representative of the Ministry of Health and Quality of Life (represented by the Dangerous Chemicals Control Board), for the Ministry of Environment and National Development Unit and at the Ministry of Industry, SMEs, Commerce and Cooperatives (represented by the Mauritius Standards Bureau).

Assistance was also provided to the respondents by phone where and when needed. 60 % of the questionnaires were handed over to the respondents after explaining to them the purpose of the study and 40 % were sent by electronic mail with covering letters explaining the reason of the study.

Most of the respondents were interacting with the researchers conducting the study and this facilitated coordination. Only 5 % of the respondents did not reply to the call for participation and no refusal to participation was obtained from the stakeholders. In view of the length and complexity, most respondents were not able to give timely replies and sought for more time to complete the questionnaires.

For the presentation of the results, the stakeholders were grouped in two categories:

Category 1: Stakeholders from the ministries and their agencies. A list of this is found in Section 7.1.

Category 2: Local authorities and the other stakeholders listed (see Sections 7.2 to 7.12) as follows: Key industrial agricultural associations, chemical manufacturers, importers, exporters, consumers, NGO’s, Trade Unions, law enforcing agency, academia and the media.

A common reaction observed among the respondents was that most of them did not respond to questions where their views or comments were requested. This was attributed to the short time they allocated themselves for responding to the questionnaire and thus they refrained from making comments wherever requested.

⁶ This is data collected from the Questionnaire 2

8.1 Risk reduction

Part 1: Statistical data

Category1: Ministries and agencies

The stakeholders numbered 1.1 to 1.10 in Table 8.1 correspond to the list of ministries that are given in Section 7.1

Table 8.1: Risk Analysis Survey – Key Ministries

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % | |
|-----|---|-------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|-----|------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | | |
| 1.1 | Impact of chemicals and wastes on humans and environment | 1 | None at all | | | | | | | | | | | | 0 | 0 |
| | | 2 | Not much | | | | | | | | | | X | 1 | 10 | |
| | | 3 | Moderate | | | | | | | X | | | | 1 | 10 | |
| | | 4 | Considerable | X | | X | X | | X | | | X | | 5 | 50 | |
| | | 5 | Very much | | X | | | X | | | X | | | 3 | 30 | |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.2 | Measures in Zambia that protect human health and the environment from chemical exposure | 1 | None at all | | | | | | | | | | | | 0 | 0 |
| | | 2 | Not much | | | | | | | | | | | | 0 | 0 |
| | | 3 | Moderate | | | | | | | X | | | | x | 2 | 20 |
| | | 4 | Considerable | X | | X | X | X | X | | | | | | 5 | 50 |
| | | 5 | Very much | | X | | | | | | X | x | | | 3 | 30 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.3 | H & Env | | | | | | | | | | | | | | | |
| | Knowledge of National Institutes involved in risk management | 1 | None at all | | | | | | | | | | | | 0 | 0 |
| | | 2 | Not much | x | | | | | | | | | | x | 2 | 20 |
| | | 3 | Moderate | | | | | | X | X | | | | | 2 | 20 |
| | | 4 | Considerable | | | X | X | X | | | | x | | | 4 | 40 |
| | | 5 | Very much | | X | | | | | | X | | | | 2 | 20 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| | Social Eco | | | | | | | | | | | | | | | |
| | Knowledge of National Institutes involved in risk management | 1 | None at all | | | | | | | | X | | | x | 2 | 20 |
| | | 2 | Not much | x | | | | | | | x | | x | | 3 | 30 |
| | | 3 | Moderate | | | X | X | | X | | | | | | 3 | 30 |
| | | 4 | Considerable | | | | | X | | | | | | | 1 | 10 |
| | | 5 | Very much | | X | | | | | | | | | | 1 | 10 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.4 | Institutional knowledge of stoppage of production and use of risk chemicals | | | | | | | | | | | | | | | |
| | Institutional knowledge of stoppage of production and use of risk chemicals | 1 | Not aware | | | | | | | X | | | | | 1 | 10 |
| | | 2 | Slightly | | | X | | | | | | | X | 2 | 20 | |
| | | 3 | Very much | X | X | | X | X | X | | X | X | | 7 | 70 | |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.5 | Category of the measures cited in 1.4 above | | | | | | | | | | | | | | | |
| | Category of the measures cited in 1.4 above | 1 | Not sure | | | | | | | X | | | | | 1 | 10 |
| | | 2 | Others | | | | X | | | | | | | | 1 | 10 |
| | | 3 | Admin | | | | | | X | | | | | | 1 | 10 |
| | | 4 | Legal | x | X | X | | X | | | X | x | X | | 7 | 70 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.6 | Efficiency of measures in cited in 1.4 above | | | | | | | | | | | | | | | |
| | Efficiency of measures in cited in 1.4 above | 1 | Not sure | | X | | | | | X | | | | | 2 | 22.2 |
| | | 2 | Inadequate | | | | X | | X | | X | X | X | | 5 | 55.6 |
| | | 3 | Adequate | x | | | | X | | | | | | | 2 | 22.2 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % | |
|------|--|-------|--------------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|------|-------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | | |
| | TOTAL | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100.0 |
| 1.7 | Knowledge of incidences of chemical releases to environment | 1 | Yes | X | X | | X | X | X | X | X | X | X | x | 9 | 90 |
| | | 2 | No | | | X | | | | | | | | | 1 | 10 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.8 | If yes in 1.7 above; level of preparedness to address incidences | 1 | None at all | | | | | | | | X | | | 1 | 10 | |
| | | 2 | Low | | | X | | | X | | | | | 2 | 20 | |
| | | 3 | Moderate | X | X | | X | X | | X | | X | X | 7 | 70 | |
| | | 4 | High | | | | | | | | | | | | | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |
| 1.9 | If yes in 1.7 above; source of information is? | 1 | TV | | | | X | | X | X | X | X | X | 6 | 25 | |
| | | 2 | Papers | | | | X | | X | X | X | X | X | 6 | 25 | |
| | | 3 | Radio | | | | X | | X | X | X | X | X | 6 | 25 | |
| | | 4 | Personal Contacts | X | X | | X | X | X | | X | | | 6 | 25 | |
| | Total | | | 1 | 1 | 0 | 4 | 1 | 4 | 3 | 4 | 3 | 3 | 24 | 100 | |
| 1.10 | Institutional awareness of Principle 15 of Rio Declaration | 1 | Yes | X | X | X | X | X | X | X | | | | 7 | 77.8 | |
| | | 2 | No | | | | | | | | X | | X | 2 | 22.2 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 9 | 100 | |
| 1.11 | Extent of Application & Promotion of Pollution Prevention | 1 | None at all | | | | | | | | X | | | 1 | 10 | |
| | | 2 | Low | | | | | | | | X | | | 1 | 10 | |
| | | 3 | Moderate | X | | | | | X | | | | X | 3 | 30 | |
| | | 4 | High | | X | X | X | X | | | | | x | 5 | 50 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |
| 1.12 | If "None" in 1.11 above; state reasons | 1 | None at all | | | | | | | | | | | | | |
| | | 2 | Not enough | | | | | | | | | | | | | |
| | | 3 | Poor culture | | | | | | | | | | | | | |
| | | 4 | Inadequate funding | | | | | | | | | | | | | |
| | Total | | | | | | | | | | | | | | | |
| 1.13 | National capacity & readiness to tackle global concerns | 1 | Very low | | | | | | | | X | | | 1 | 10 | |
| | | 2 | Low | | | | | | | | X | | | 1 | 10 | |
| | | 3 | Moderate | X | X | X | X | X | X | | | | X | 7 | 70 | |
| | | 4 | High | | | | | | | | | X | | 1 | 10 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |
| 1.14 | Challenges to 1.13 Human resource | 1 | Very low | | | | | | | | | | | | | |
| | | 2 | Low | X | X | | | | | | X | | | 3 | 30 | |
| | | 3 | Moderate | | | | | | | | | x | | 1 | 10 | |
| | | 4 | High | | | X | X | X | X | X | | | X | 6 | 60 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |
| | Challenges to 1.13 Financial resource | 1 | Very low | | | | | | | | X | X | | 2 | 20 | |
| | | 2 | Low | X | X | | | | | | | X | | 3 | 30 | |
| | | 3 | Moderate | | | X | | | | | | | X | 2 | 20 | |
| | | 4 | High | | | | X | X | X | | | | | 3 | 30 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |
| | Challenges to 1.13 | 1 | Very low | | | | | | | | | x | | 1 | 10 | |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % |
|--------------|---|--------------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| | Lack of Political Will | 2 | Low | | X | X | | X | X | | | | | 4 | 40 |
| | | 3 | Moderate | X | | | X | | | X | | | X | 4 | 40 |
| | | 4 | High | | | | | | | | X | | | 1 | 10 |
| | | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| | Challenges to 1.13 Admin Capacity | 1 | Very low | | | | | | | X | X | X | | 3 | 30 |
| | | 2 | Low | | X | | X | X | | | | | | 3 | 30 |
| | | 3 | Moderate | X | | X | | | X | | | | X | 4 | 40 |
| | | 4 | High | | | | | | | | | | | 0 | 0 |
| Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| | Challenges to 1.13 Other Poverty & Sustainable Development Priorities | 1 | Very low | | X | X | X | | | | | | | 3 | 30 |
| | | 2 | Low | | | | | X | | X | X | x | | 4 | 40 |
| | | 3 | Moderate | X | | | | | X | | | | X | 3 | 30 |
| | | 4 | High | | | | | | | | | | | | |
| Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| | Challenges to 1.13 Poor Linkage of Environment issues to Development | 1 | Very low | | X | | | | | | | x | | 2 | 22.2 |
| | | 2 | Low | | | X | | | X | | | | x | 3 | 33.3 |
| | | 3 | Moderate | X | | | X | | | X | | | | 3 | 33.3 |
| | | 4 | High | | | | | | | | X | | | 1 | 11.2 |
| Total | | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 9 | 100 | |
| 1.15 | Quantity, type and toxicity of hazardous waste generation | 1 | Not at all | | | | | | | | X | | | 1 | 10 |
| | | 2 | Not much | | | | | | | | | | | 0 | 0 |
| | | 3 | Moderate | X | | | | | X | | | | | 2 | 20 |
| | | 4 | Considerable | | X | X | | X | | | X | x | x | 6 | 60 |
| | | 5 | Very much | | | | X | | | | | | | 1 | 10 |
| Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.16 | Extent of awareness on how hazardous waste is generated | 1 | Not at all | | | | | | | | X | | | 1 | 11.1 |
| | | 2 | Not much | X | | | | | | | | | | 1 | 11.1 |
| | | 3 | Moderate | | | | | | X | | | | | 1 | 11.1 |
| | | 4 | Considerable | | X | X | | X | | | X | X | X | 6 | 66.7 |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 |
| Total | | | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100 | |
| 1.17 | Extent o awareness on how hazardous waste is stored | 1 | Not at all | | | | | | | | X | | | 1 | 10 |
| | | 2 | Not much | X | | | | | | | | | | 1 | 10 |
| | | 3 | Moderate | | | X | X | X | X | | | | | 4 | 40 |
| | | 4 | Considerable | | X | | | | | | | X | | 2 | 20 |
| | | 5 | Very much | | | | | | | | | X | X | 2 | 20 |
| Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.18 | Extent of awareness on how hazardous waste is transported | 1 | Not at all | | | | | | | | X | | | 1 | 10 |
| | | 2 | Not much | X | | | | | | X | | | | 2 | 20 |
| | | 3 | Moderate | | X | X | X | | | | | X | X | 5 | 50 |
| | | 4 | Considerable | | | | | X | | | X | | | 2 | 20 |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 |
| Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.19 | Extent of awareness on how hazardous waste is treated | 1 | Not at all | | | | | | | | X | | | 1 | 10 |
| | | 2 | Not much | X | | | | | | | | | x | 2 | 20 |
| | | 3 | Moderate | | x | X | | | X | | | x | | 4 | 40 |
| | | 4 | Considerable | | | | | X | | | | | | 1 | 10 |
| | | 5 | Very much | | | | X | | | | | X | | 2 | 20 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % | |
|------|---|-------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|-----|-----|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 1.20 | Extent of awareness on how hazardous waste is disposed | 1 | Not at all | | | | | | | X | | | | 1 | 10 | |
| | | 2 | Not much | | | | | | X | | | | | 1 | 10 | |
| | | 3 | Moderate | X | X | | | X | | | | X | X | 5 | 50 | |
| | | 4 | Considerable | | | X | | | | | | | | 1 | 10 | |
| | | 5 | Very much | | | | X | | | | X | | | 2 | 20 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.21 | Knowledge of institutions which recover & recycle hazardous materials and waste | 1 | Not at all | | | | | | | X | | | | 1 | 10 | |
| | | 2 | Not much | | | | | | | | | | X | 1 | 10 | |
| | | 3 | Moderate | X | X | | | X | X | | | x | | 5 | 50 | |
| | | 4 | Considerable | | | X | | | | | | | | 1 | 10 | |
| | | 5 | Very much | | | | X | | | | X | | | 2 | 20 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.22 | From 1.21; would you describe their operations as environmental friendly | 1 | Not at all | | | | | | | | | | X | 1 | 10 | |
| | | 2 | Not much | | | | | | | | | x | | 1 | 10 | |
| | | 3 | Moderate | X | X | X | X | X | X | X | X | | | 7 | 70 | |
| | | 4 | Considerable | | | | | | | | X | | | 1 | 10 | |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.23 | Knowledge of cleaner production concept (theory& practice) | 1 | Not at all | | | | | | | X | | | | 1 | 10 | |
| | | 2 | Not much | | | | | | | | | | X | 1 | 10 | |
| | | 3 | Moderate | | X | | | | X | | | x | | 3 | 30 | |
| | | 4 | Considerable | X | | X | | X | | | X | | | 4 | 40 | |
| | | 5 | Very much | | | | X | | | | | | | 1 | 10 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.24 | Knowledge of institutions in R&D producing new, safer chemical & biological materials | 1 | Not at all | X | | X | X | | X | X | X | X | X | 8 | 80 | |
| | | 2 | Not much | | | | | | | | | | | 0 | 0 | |
| | | 3 | Moderate | | | | | X | | | | | | 1 | 10 | |
| | | 4 | Considerable | | X | | | | | | | | | 1 | 10 | |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.25 | If score in 1.24 is 2-5; state names of organisations, and your area of concern Names of org MSIRI & AREU | | | | | | | | | | | | | | | |
| 1.26 | Knowledge of role of chemicals and waste conventions in risk reduction | 1 | Not at all | | | | | | | X | X | | X | 3 | 30 | |
| | | 2 | Not much | | | | | | | | | | | 0 | 0 | |
| | | 3 | Moderate | X | | | | | X | | | | | 2 | 20 | |
| | | 4 | Considerable | | X | X | | X | | | | x | | 4 | 40 | |
| | | 5 | Very much | | | | X | | | | | | | 1 | 10 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.27 | Any training and awareness to deal with poisoning and chemical incidences? | 1 | Not aware | X | | X | | | X | X | | | x | 5 | 50 | |
| | | 2 | No | | X | | | | | | X | | | 2 | 20 | |
| | | 3 | Yes | | | | X | X | | | | x | | 3 | 30 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 1.28 | Knowledge of institutional | 1 | Not at all | | | | | | X | | X | | X | 3 | 30 | |
| | | 2 | Not much | | | X | | X | | X | | x | | 4 | 40 | |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % | |
|------|--|-------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|------|------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | | |
| | awareness on risk assessment, management and communication | 3 | Moderate | X | X | | | | | | | | | | 2 | 20 |
| | | 4 | Considerable | | | | | | | | | | | | 0 | 0 |
| | | 5 | Very much | | | | X | | | | | | | | 1 | 10 |
| | | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 1.29 | If score is 2-5, Has your institution benefited from training & awareness? | 1 | Not at all | | | X | | | X | | X | | | 3 | 33.3 | |
| | | 2 | Not much | X | X | | | | X | | X | | | x | 5 | 55.5 |
| | | 3 | Moderate | | | | X | | | | | | | | 1 | 11.2 |
| | | 4 | Considerable | | | | | | | | | | | | 0 | 0 |
| | | 5 | Very much | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 9 | 100 | |

Category 2: Local authorities:

Table 8.2 gives the responses of local authorities and other stakeholders to the risk analysis survey. The stakeholders 1 to 12 correspond to stakeholders given in Sections 7.2 to 7.12. Note that stakeholder number 9 (trade union) in Table 8.2 did not respond to the questionnaire.

Table 8.2: Risk Analysis Survey: Local Authorities and other stakeholders

| Q | Description | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Tot | % |
|-----|---|-------------|-------|--------------|--------------|---|---|---|---|---|---|---|---|----|----|----|------|------|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| 1.1 | Impact of chemicals and wastes on humans and environment | 1 | 1 | None at all | | | | | | | | | | | | | 0 | 0 |
| | | 2 | 2 | Not much | | | | | | | | | | | | | 0 | 0 |
| | | 3 | 3 | Moderate | | X | | X | | | | | | | | X | 3 | 27.2 |
| | | 4 | 4 | Considerable | | | | | X | X | | x | | | | | 4 | 36.4 |
| | | 5 | 5 | Very much | | | X | | | | X | | | | X | X | 4 | 36.4 |
| | TOTAL | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.2 | Measures in Zambia that protect human health and the environment from chemical exposure | 1 | 1 | None at all | | | | | | | | | | | | | | |
| | | 2 | 2 | Not much | | | | | | | | X | | | | | 1 | 9.1 |
| | | 3 | 3 | Moderate | | X | | X | X | | X | | | | | X | 5 | 45.5 |
| | | 4 | 4 | Considerable | x | | | | | X | | | | | X | | 3 | 27.2 |
| | | 5 | 5 | Very much | | | X | | | | | | | | | X | 2 | 18.2 |
| | TOTAL | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.3 | H & Env | H & Env | | | | | | | | | | | | | | | | |
| | Knowledge of National Institutes involved in risk management | 1 | 1 | None at all | | | | | | | | | | | | | 0 | 0 |
| | | 2 | 2 | Not much | | X | | | | X | | | | | | | 2 | 18.2 |
| | | 3 | 3 | Moderate | | | | | | | X | X | | | X | X | 4 | 36.4 |
| | | 4 | 4 | Considerable | x | | X | X | X | | | | | | | | 4 | 36.4 |
| | | 5 | 5 | Very much | | | X | | | | | | | | | X | 1 | 9 |
| | TOTAL | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| | Social Eco Knowledge of National Institutes involved in risk management | 1 | 1 | None at all | | | | | | | | | | | | | 0 | 0 |
| | | 2 | 2 | Not much | | X | | | | X | X | X | | | X | X | 6 | 54.6 |
| | | 3 | 3 | Moderate | | | X | X | X | | | | | | | X | 4 | 36.4 |
| | | 4 | 4 | Considerable | x | | | | | | | | | | | | 1 | 9 |
| | | 5 | 5 | Very much | | | | | | | | | | | | | 0 | 0 |
| | TOTAL | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.4 | Institutional knowledge of stoppage of production and use of risk chemicals | 1 | 1 | Not aware | | | | | | | | | | | | | 0 | 0 |
| | | 2 | 2 | Slightly | | X | | X | X | X | | X | | | X | X | 7 | 63.6 |
| | | 3 | 3 | Very much | X | | X | | | | | x | | | X | | 4 | 36.4 |
| | | | TOTAL | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 |
| 1.5 | Category of the measures cited in 1.4 above | 1 | 1 | Not sure | | | | X | | | | | | | | X | 2 | 18.1 |
| | | 2 | 2 | Others | | | | | | | | | | | | | 0 | 0 |
| | | 3 | 3 | Admin | X | X | X | | X | | X | | | | | | 5 | 45.5 |
| | | 4 | 4 | Legal | | | | | | X | | X | | | X | X | 4 | 36.4 |
| | TOTAL | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.6 | Efficiency of measures in cited in 1.4 above | 1 | 1 | Not sure | | | | | X | | | X | | | | X | 3 | 27.3 |
| | | 2 | 2 | Inadequate | X | X | | X | | | X | | | | X | | 5 | 45.4 |
| | | 3 | 3 | Adequate | | | X | | | X | | | | X | | 3 | 27.3 | |
| | | | TOTAL | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 |

| Q | Description | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Tot | % | |
|--------------------|--|----------------|--------------|--------------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-----|-----|------|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| 1.7 | Knowledge of incidences of chemical releases to environment | | 1 | Yes | X | X | X | X | X | X | X | X | | X | X | X | 11 | 100 | |
| | | | 2 | No | | | | | | | | | | | | | 0 | 0 | |
| | | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.8 | If yes in 1.7 above; level of preparedness to address incidences | | 1 | None at all | | | | | | | X | | | | | | 1 | 9.1 | |
| | | | 2 | Low | | | | | X | | | | | | | | 1 | 9.1 | |
| | | | 3 | Moderate | X | | X | X | | X | | X | | | | X | X | 7 | 63.6 |
| | | | 4 | High | | X | | | | | | | | | X | | | 2 | 18.2 |
| Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 | | |
| 1.9 | If yes in 1.7 above; source of information is? | | 1 | TV | X | X | | X | | | X | X | | X | X | X | 8 | 30 | |
| | | | 2 | Papers | | X | | X | | | X | X | | X | X | X | 7 | 26 | |
| | | | 3 | Radio | | | | X | | | X | X | | X | X | X | 6 | 23 | |
| | | | 4 | Personal Contacts | | | X | | | X | X | | | X | | X | 5 | 19 | |
| Total | Total | | | 1 | 2 | 1 | 3 | 0 | 1 | 4 | 3 | | 4 | 3 | 4 | | | | |
| 1.10 | Institutional awareness of Principle 15 of Rio Declaration | | 1 | Yes | | | X | X | X | X | X | X | | X | X | X | 9 | 81 | |
| | | | 2 | No | X | X | | | | | | | | | | | 2 | 18 | |
| | | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.11 | Extent of Application & Promotion of Pollution Prevention | | 1 | None at all | | | | | | | | | | | | | 0 | 0 | |
| | | | 2 | Low | | | | | | | | | | | | | 0 | 0 | |
| | | | 3 | Moderate | X | X | | X | X | X | | | | | X | X | X | 8 | 72 |
| | | | 4 | High | | | X | | | | X | X | | | | | | 3 | 27 |
| Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 | | |
| 1.12 | If "None" in 1.11 above; state reasons | | 1 | None at all | | | | | | | | | | | | | 0 | 0 | |
| | | | 2 | Not enough | | | | | | | | | | | | | 0 | 0 | |
| | | | 3 | Poor culture | | X | | | | | | | | | | | | 1 | 100 |
| | | | 4 | Inadequate Funding | | | | | | | | | | | | | | 0 | 0 |
| Total | Total | | | | 1 | | | | | | | | | | | 1 | 100 | | |
| 1.13 | National capacity & readiness to tackle global concerns | | 1 | Very low | | | | | | | X | | | | | | 1 | 9 | |
| | | | 2 | Low | | | | X | X | X | | X | | | | | 4 | 36 | |
| | | | 3 | Moderate | X | X | X | | | | | | | X | X | X | 6 | 54 | |
| | | | 4 | High | | | | | | | | | | | | | 0 | 0 | |
| Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 | | |
| 1.14 | Challenges to 1.13 | | | | | | | | | | | | | | | | | | |
| | | Human resource | 1 | Very low | | | | | X | | | | | | | | | 1 | 9 |
| | | | 2 | Low | | | | | | | | | | | | X | | 1 | 9 |
| | | | 3 | Moderate | X | X | X | X | | X | | | | | X | X | | 5 | 45 |
| | | | 4 | High | | | | | | | X | X | | | | | | 4 | 36 |
| Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 | | |
| Challenges to 1.13 | Financial resource | | | | | | | | | | | | | | | | | | |
| | | 1 | Very low | | | | | | | | | | | | | | | | |
| | | 2 | Low | | X | | | X | | | X | | | | | | 3 | 27 | |
| | | 3 | Moderate | X | | X | X | | X | | | | | X | X | X | 7 | 63 | |
| | | 4 | High | | | | | | | | X | | | | | | 1 | 9 | |
| Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 | | |
| Challenges to 1.13 | Lack of Political Will | | 1 | Very low | | | | | | | X | | | | | | 1 | 10 | |
| | | 2 | Low | | X | X | | | | | | | X | | | 3 | 30 | | |

| Q | Description | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Tot | % |
|------|---|-------------|-------|--------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-----|-----|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| | | | 3 | Moderate | X | | | X | | | | | | | X | X | 4 | 40 |
| | | | 4 | High | | | | | X | X | | | | | | | 2 | 20 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | | 1 | 1 | 1 | 10 | 100 |
| | Challenges to 1.13 Admin Capacity | | 1 | Very low | | | | | | | X | | | | | | 1 | 9 |
| | | | 2 | Low | | X | | X | | | | X | | | X | X | 5 | 45 |
| | | | 3 | Moderate | X | | X | | | | | | | | | | 2 | 18 |
| | | | 4 | High | | | | X | | X | | | | X | | | 3 | 27 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 99 |
| | Challenges to 1.13 Other Poverty & Sustainable Development Priorities | | 1 | Very low | | | | | | | | | | X | | | 1 | 9 |
| | | | 2 | Low | | X | X | | X | | | | | | X | X | 5 | 45 |
| | | | 3 | Moderate | X | | | | | | | X | | | | | 2 | 18 |
| | | | 4 | High | | | | X | | X | X | | | | | | 3 | 27 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| | Challenges to 1.13 Poor Linkage of Environment issues to Development | | 1 | Very low | | | | | | | | | | | | | 0 | 0 |
| | | | 2 | Low | | X | X | | | | | X | | | | | 3 | 27 |
| | | | 3 | Moderate | X | | | | X | | | | | X | | X | 4 | 36 |
| | | | 4 | High | | | | X | | X | X | | | | X | | 4 | 36 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.15 | Quantity, type and toxicity of hazardous waste generation | | 1 | Not at all | | | | | | X | | | | | | | 1 | 9 |
| | | | 2 | Not much | | | | | | | | | | | X | | 1 | 9 |
| | | | 3 | Moderate | | X | | X | | | | X | | | | | 3 | 27 |
| | | | 4 | Considerable | X | | X | | X | | | | | X | | X | 5 | 45 |
| | | | 5 | Very much | | | | | | | X | | | | | | 1 | 9 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.16 | Extent of awareness on how hazardous waste is generated | | 1 | Not at all | | | | | | | X | | | | | | 1 | 9 |
| | | | 2 | Not much | | | | | | X | | | | | | | 1 | 9 |
| | | | 3 | Moderate | | | | | X | | | X | | X | X | | 4 | 36 |
| | | | 4 | Considerable | | X | X | x | | | | | | | | X | 4 | 36 |
| | | | 5 | Very much | X | | | | | | | | | | | | 1 | 9 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.17 | Extent o awareness on how hazardous waste is stored | | 1 | Not at all | | | | | | | | | | | | | 0 | 0 |
| | | | 2 | Not much | | | | | | X | X | | | | X | X | 4 | 36 |
| | | | 3 | Moderate | X | | | | | | | X | | | | | 3 | 27 |
| | | | 4 | Considerable | | X | x | X | X | | | | | | | | 4 | 36 |
| | | | 5 | Very much | | | | | | | | | | | | | 0 | 0 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.18 | Extent of awareness on how hazardous waste is transported | | 1 | Not at all | | | | | | | | | | | | | 0 | 0 |
| | | | 2 | Not much | | | | | | X | X | X | | | X | X | 5 | 45 |
| | | | 3 | Moderate | X | X | X | | | | | | | | | | 3 | 27 |
| | | | 4 | Considerable | | | | X | X | | | | | X | | | 3 | 27 |
| | | | 5 | Very much | | | | | | | | | | | | | 0 | 0 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.19 | Extent of awareness on how hazardous waste is treated | | 1 | Not at all | | | | | | | X | | | | | | 1 | 10 |
| | | | 2 | Not much | | | | | | | | | | X | | | 1 | 10 |
| | | | 3 | Moderate | X | X | | | | X | | X | | | X | X | 6 | 60 |
| | | | 4 | Considerable | | | X | X | | | | | | | | | 2 | 20 |
| | | | 5 | Very much | | | | | | | | | | | | | 0 | 0 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 |
| 1.20 | Extent of awareness on | | 1 | Not at all | | | | | | | | | | | | | 0 | 0 |

| Q | Description | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Tot | % | |
|------|---|--------------|-------|--------------|--------------|---|-----------------------|--------------------------------------|---|---|---|---|---|----|----|----|-----|-----|----|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| | how hazardous waste is disposed | | 2 | Not much | | | | | | | | | | | X | | X | 2 | 18 |
| | | | 3 | Moderate | X | X | X | X | X | X | | X | | | | X | | 8 | 72 |
| | | | 4 | Considerable | | | | | | | X | | | | | | | 1 | 9 |
| | | | 5 | Very much | | | | | | | | | | | | | | 0 | 0 |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | |
| 1.21 | Knowledge of institutions which recover & recycle hazardous materials and waste | | 1 | Not at all | | | | | | X | X | | | | | | 2 | 18 | |
| | | | 2 | Not much | | | | | X | | | | | X | X | | 3 | 27 | |
| | | | 3 | Moderate | X | X | | X | | | | | X | | | | 4 | 36 | |
| | | | 4 | Considerable | | | X | | | | | | | | | X | 2 | 18 | |
| | | | 5 | Very much | | | | | | | | | | | | | 0 | 0 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | | |
| 1.22 | From 1.21; would you describe their operations as environmental friendly | | 1 | Not at all | | | | | | | X | | | X | | | 2 | 18 | |
| | | | 2 | Not much | X | | | | X | | | | | | X | | 3 | 27 | |
| | | | 3 | Moderate | | X | | X | | | | X | | | | X | 4 | 36 | |
| | | | 4 | Considerable | | | X | | | | | | | | | | 1 | 9 | |
| | | | 5 | Very much | | | | | | X | | | | | | | 1 | 9 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | | |
| 1.23 | Knowledge of cleaner production concept (theory& practice) | | 1 | Not at all | | | | | | | | | | | | | | | |
| | | | 2 | Not much | | X | | | | | | X | | | | | 2 | 18 | |
| | | | 3 | Moderate | | | | | X | | X | | | X | | | 3 | 27 | |
| | | | 4 | Considerable | X | | X | X | | | | | | | | | 3 | 27 | |
| | | | 5 | Very much | | | | | | X | | | | | X | X | 3 | 27 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | | |
| 1.24 | Knowledge of institutions in R&D producing new, safer chemical & biological materials | | 1 | Not at all | | X | | | | X | X | | | | | | 3 | 27 | |
| | | | 2 | Not much | X | | | | | | | X | | X | | | 4 | 36 | |
| | | | 3 | Moderate | | | | X | X | | | | | | X | | 3 | 27 | |
| | | | 4 | Considerable | | | X | | | | | | | | | | 1 | 9 | |
| | | | 5 | Very much | | | | | | | | | | | | | 0 | 0 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | | |
| 1.25 | If score in 1.24 is 2-5; state names of organisations, and your area of concern Names of org MSIRI & AREU | Names of org | | | M R C | | M S I R I | M R C M S I R I | | | | | | | | | | | |
| 1.26 | Knowledge of role of chemicals and waste conventions in risk reduction | | 1 | Not at all | | | | | | | | | | | | | 0 | 0 | |
| | | | 2 | Not much | | X | | | | | X | | | | | | 2 | 18 | |
| | | | 3 | Moderate | X | | | | X | | | X | | X | X | X | 6 | 54 | |
| | | | 4 | Considerable | | | X | X | | | | | | | | | 2 | 18 | |
| | | | 5 | Very much | | | | | | X | | | | | | | 1 | 9 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | | |
| 1.27 | Any training and awareness to deal with poisoning and chemical incidences? | | 1 | Not aware | X | X | | | | X | | | | X | X | X | 6 | 60 | |
| | | | 2 | No | | | | | | | X | X | | | | | 2 | 20 | |
| | | | 3 | Yes | | | X | X | | | | | | | | | 2 | 20 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | | 1 | 1 | 1 | 10 | 100 | |
| 1.28 | Knowledge of institutional awareness on risk assessment, management and communication | | 1 | Not at all | | | | | | | | | | | | | 0 | 0 | |
| | | | 2 | Not much | | X | | | | | X | X | | X | X | | 5 | 45 | |
| | | | 3 | Moderate | X | | | X | X | | | | | | | X | 4 | 36 | |
| | | | 4 | Considerable | | | X | | | | | | | | | | 1 | 9 | |
| | | | 5 | Very much | | | | | | X | | | | | | | 1 | 9 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 11 | 100 | |
| 1.29 | If score is 2-5, Has your | | 1 | Not at all | | | | | | | X | | | X | | | 2 | 18 | |

| Q | Description | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Tot | % |
|---|--|-------------|-------|--------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-----|---|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| | institution benefited from training & awareness? | | 2 | Not much | X | | X | | | | | X | | | X | 4 | 36 | |
| | | | 3 | Moderate | | X | | X | X | | | | | X | | 4 | 36 | |
| | | | 4 | Considerable | | | | | | | | | | | | 0 | 0 | |
| | | | 5 | Very much | | | | | X | | | | | | | 1 | 9 | |
| | Total | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | |

Part 2: Written Views of stakeholders on Risk Reduction extracted from the Questionnaires

Ministries and agencies

Table 8.3 gives the views of key Ministries and agencies regarding risk reduction. Note that most of them did not give comments.

Table 8.3: Views of key Ministries and agencies on Risk Reduction

| Question | Description | Stakeholder | Views of stakeholders |
|----------|---|-------------|---|
| 1.31 | Min of Environment & NDU | 1 | Priorities are identified through public stakeholder consultation at workshops and seminars |
| | Min of Health and Quality of Life | 2 | None |
| | Min of Local Govt | 3 | None |
| | Min of Labour, industrial Relations & Employment | 4 | Most of the trainings obtained were face-to-face lectures. Skills and experience are gathered through industrial training attachments |
| | Min of Agro Industry and Fisheries | 5 | None |
| | Min of industry, SME, commerce and Cooperatives (MSB) | 6 | None |
| | Min of Women's rights, Child Development family welfare and Consumer Protection | 7 | None |
| | Min of Public Utilities | 8 | None |
| | Min of Education & Human Resources | 9 | None |

Structure of Cooperation between different stakeholders (question 3.20)

Various Technical Committees and Technical Advisory Committees are set up as and when required on matters pertaining to the scientific and technical aspects of environmental protection and management. In these fora the different stakeholders express their formal views and propose actions to be taken by the government to solve the problems. The final decisions rest upon the ministerial cabinet.

The Dangerous Chemical Control Board is also a main coordinating body regarding the management of dangerous chemicals. (See Sections 5 and 7.1)

Local authorities and other stakeholders

Table 8.4 gives the views of local authorities and other stakeholders with regard to risk reduction. Again not many comments were received.

Table 8.4: Views of Local authorities and other stakeholders on Risk Reduction

| Category 2 -12 | | | |
|----------------|--|-------------|---|
| Q | Description | Stakeholder | Institution training was obtained and their views |
| 1.3 | Municipality of Vacoas/Phoenix | 1 | None |
| | District council of Riviere du Rempart | 2 | None |
| | Key Agricultural Association Mauritius Chamber of Agriculture | 3 | None |
| | Chemical Manufacturer Mauvilac Industries | 4 | None |
| | Chemical Importers Ducray Le Noir | 5 | None |
| | Chemical Exporters Cernol Group | 6 | The chemical exporters claim to receive training on chemicals management from their suppliers of chemicals in South Africa. They also report that most of the research and development activities related to new environmentally sound chemicals are undertaken at the supplier level. They also complained about the low enforcement prevailing in the country |
| | Chemical Consumers Lab Technicians | 7 | Complaints were received to the fact that no proper waste management strategies existed as far as chemical and chemical wastes are concerned. The lack of awareness of the treatment methods/facilities available for treating their chemical waste also hindered their ability to direct the waste to the authorities concerned. They also complained of lack of information related to potential recyclers (if any existed) and information pertaining to proper transport are missing in the country. They also believe that more emphasis should be placed on training the laboratory personnel on how to manage their chemicals properly. |
| | NGO's Chemical Eng Society UoM Student Group | 8 | None |
| | Trade Union | 9 | No response received |
| | Law Enforcement Agency Police De L'Environment | 10 | None |
| | Academia | 11 | Academia deplores a lack of training and awareness amongst the industry community. They believe that major effort should be geared towards sensitization of the risk groups and development of the proper infrastructures to accommodate the hazardous waste generated at a first instance. |
| | Media | 12 | The stakeholder believes that the management of waste in the company itself is not a major issue yet however since they are involved in communicating risk to public, they should receive proper training regarding risk communication. They also wish to receive induction courses to risk management as they wish to better understand their role in case of emergencies in the country. |

8.2 Knowledge and information

Table 8.5: Response of key Ministries and agencies regarding knowledge and information

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % |
|-------|---|-------|--------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| 2.1 | Source of information on chemicals/waste | 1 | Others | X | | X | X | | | | X | | X | 5 | 35.7 |
| | | 2 | Foreign | | | | X | | | X | | x | | 3 | 21.4 |
| | | 3 | Loc Govt | | | | | X | X | | | | | 2 | 14.3 |
| | | 4 | Central Govt | | X | X | | X | | X | | | | 4 | 28.6 |
| | TOTAL | | | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | | |
| 2.2 | Adequacy of information for chemical management throughout life-cycle of chemical | 1 | None at all | | | | | | | | | | | 0 | 0 |
| | | 2 | Not much | X | | X | | X | | | X | X | X | 6 | 60 |
| | | 3 | Moderate | | X | | X | | X | X | | | | 4 | 40 |
| | | 4 | Considerable | | | | | | | | | | | 0 | 0 |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 2.3.1 | Adequacy of Information:- Complexity of Language used Complexity | 1 | Not possible | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | X | | | | | X | X | | 3 | 30 |
| | | 3 | Medium | X | X | | X | X | X | X | | | X | 7 | 70 |
| | | 4 | High | | | | | | | | | | | 0 | 0 |
| | | 5 | Very high | | | | | | | | | | | 0 | 0 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 2.3.2 | Effects on human health and environment | 1 | Not possible | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | X | | X | | | X | | | 3 | 30 |
| | | 3 | Medium | X | X | | | | X | X | | X | | 5 | 50 |
| | | 4 | High | | | | X | | | | | | X | 2 | 20 |
| | | 5 | Very high | | | | | | | | | | | 0 | 0 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 2.3.3 | Potential uses | 1 | Not possible | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | X | | | | | X | | | 2 | 20 |
| | | 3 | Medium | X | X | | X | X | X | X | | X | X | 8 | 80 |
| | | 4 | High | | | | | | | | | | | 0 | 0 |
| | | 5 | Very high | | | | | | | | | | | 0 | 0 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 2.3.4 | Protective measures | 1 | Not possible | | | | | | | | X | | | 1 | 10 |
| | | 2 | Low | | | | | | | | | | | 0 | 0 |
| | | 3 | Medium | X | X | X | X | X | X | X | | | X | 8 | 80 |
| | | 4 | High | | | | | | | | | X | | 1 | 10 |
| | | 5 | Very high | | | | | | | | | | | 0 | 0 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 2.3.5 | Regulations | 1 | Not possible | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | | X | X | | X | | | X | 4 | 40 |
| | | 3 | Medium | X | | | | | X | | | | | 2 | 20 |
| | | 4 | High | | X | X | | | | | X | X | | 4 | 40 |
| | | 5 | Very high | | | | | | | | | | | 0 | 0 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 2.4 | Popular modes of chemical information dissemination | 1 | Electronic | | | | X | | X | | | X | | 3 | 25 |
| | | 2 | Print media | X | X | X | | X | X | X | X | X | X | 9 | 75 |
| | | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 12 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % |
|-------|---|-------|-----------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|-------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| 2.5 | Awareness of GHS on Classification & Labelling of Chemicals | 1 | Yes | X | X | X | X | | X | | | x | | 6 | 66.7 |
| | | 2 | No | | | | | X | | X | | | X | 3 | 33.3 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 9 | 100.0 |
| 2.6 | Has any work started on GHS implementation | 1 | Not aware | | | X | | X | X | X | X | | X | 6 | 60 |
| | | 2 | Slightly aware | X | | | | | | | | | | 1 | 10 |
| | | 3 | Very much aware | | X | | X | | | | | | X | 3 | 30 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 2.7 | Has your institution benefited from any training? | 1 | Not yet | X | X | X | x | X | X | X | X | X | X | 10 | 100 |
| | | 2 | Yes | | | | | | | | | | | 0 | 0 |
| | | Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| 2.8 | If 'yes' in 2.7, who conducted the training? See Section 12 | | | | | | | | | | | | | | |
| 2.9 | Presence of Laws ensuring confidentiality of commercial & industrial information | 1 | Yes | | X | | x | | | X | | | | 3 | 30 |
| | | 2 | No | X | | X | | X | X | | X | x | X | 7 | 70 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 2.10 | Is information on chemicals relating to health, safety & environment confidential? | 1 | Yes | X | X | | x | X | | X | | X | X | 7 | 70 |
| | | 2 | No | | | X | | | X | | X | | | 3 | 30 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 2.11 | Extent to which institutions generate scientific information on chemicals & waste management. | 1 | Not aware | | | | | | | | | | | | |
| | | 2 | Low | X | X | X | x | | | X | X | | X | 7 | 70 |
| | | 3 | Medium | | | | | X | X | | | x | | 3 | 30 |
| | | 4 | High | | | | | | | | | | | 0 | 0 |
| | | 5 | Very High | | | | | | | | | | | | 0 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 10 | 100 |
| 2.12 | Extent of interface between local institutions and policy making bodies | 1 | Not aware | | | | | | | X | | | | 1 | 10 |
| | | 2 | Low | X | | X | | X | X | | X | | X | 6 | 60 |
| | | 3 | Medium | | X | | x | | | | | X | | 3 | 30 |
| | | 4 | High | | | | | | | | | | | 0 | 0 |
| | | 5 | Very High | | | | | | | | | | | | 0 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 2.13 | Awareness on information on hazard & risk assessments | 1 | No clue | X | | X | | | | X | X | | X | 5 | 50 |
| | | 2 | Slightly aware | | | | | X | X | | | x | | 3 | 30 |
| | | 3 | Very much aware | | X | | x | | | | | | | 2 | 20 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 2.14 | If response in | | | | | | | | | | | | | | |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Total | % | |
|------|---|-------|-------------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|-----|-----|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | | |
| | 2.13 is 2-3 dissemination; is via | 1 | Personal contacts | | | | | | | | | | | | 0 | 0 |
| | | 2 | Informal | | | | X | | X | | | | | | 2 | 50 |
| | | 3 | Formal | | X | | | | | | | | x | | | 2 |
| | Total | | | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 100 | |
| 2.15 | Any knowledge of National Environment Standards aimed at reducing chemical/wastes effects | 1 | Yes | X | X | X | X | X | X | X | X | X | X | X | 10 | 100 |
| | | 2 | No | | | | | | | | | | | | 0 | 0 |
| | | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 2.16 | Is there consultation when National Environmental Standards are being set? | 1 | Yes | X | X | X | X | X | X | | X | X | X | X | 9 | 90 |
| | | 2 | No | | | | | | | X | | | | | 1 | 10 |
| | | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 2.17 | Knowledge to international database on chemical safety and risk reduction strategies | 1 | Not at all | | | | | | X | X | | x | X | 4 | 40 | |
| | | 2 | Not much | X | | | | X | | | X | | | 3 | 30 | |
| | | 3 | Moderate | | X | X | X | | | | | | | 3 | 30 | |
| | | 4 | Considerable | | | | | | | | | | | 0 | 0 | |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |
| 2.18 | Extent of involvement in providing inputs, information, financial; to efforts to reduce unsound management of chemicals | 1 | Not at all | | | | | | | X | X | | X | 3 | 30 | |
| | | 2 | Not much | | | X | | | X | | | x | | 3 | 30 | |
| | | 3 | Moderate | X | X | | | X | | | | | | 3 | 30 | |
| | | 4 | Considerable | | | | X | | | | | | | 1 | 10 | |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |
| 2.19 | If score in 2.18 is 1-2; describe the problem | | | | | | | | | | | | | | | |
| 2.20 | Knowledge & information on the role chemicals and waste conventions | 1 | Not at all | | | | | | | X | X | | X | 3 | 30 | |
| | | 2 | Not much | | | | | | | | | X | | 1 | 10 | |
| | | 3 | Moderate | X | | | | X | X | | | | | 3 | 30 | |
| | | 4 | Considerable | | X | X | X | | | | | | | 3 | 30 | |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | | |

Table 8.6: Response of key other stakeholders regarding knowledge and information

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Total | % | |
|-------|---|-------|--------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-------|-----|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| 2.1 | Source of information on chemicals/waste | 1 | Others | X | | X | | | | | | | | X | | | 3 | 17 |
| | | 2 | Foreign | | X | | | X | X | X | X | | | | X | X | 7 | 41 |
| | | 3 | Loc Govt | | | | | | | | X | | | | X | X | 2 | 11 |
| | | 4 | Central Govt | | | | X | | | | | X | | X | X | X | 5 | 29 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 0 | 2 | 2 | 3 | 17 | 100 | |
| 2.2 | Adequacy of information for chemical management throughout life-cycle of chemical | 1 | None at all | | | | | | | | X | | | | | | 1 | 9 |
| | | 2 | Not much | X | X | | X | X | X | | | | | X | X | X | 8 | 72 |
| | | 3 | Moderate | | | | | | | | | X | | | | | 1 | 9 |
| | | 4 | Considerable | | | X | | | | | | | | | | | 1 | 9 |
| | | 5 | Very much | | | | | | | | | | | | | | 0 | 0 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.3.1 | Adequacy of Information:- Complexity of Language used Complexity | 1 | Not possible | | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | X | | | | | X | | | | | | | | 2 | 18 |
| | | 3 | Medium | | X | X | X | X | | X | X | | X | X | X | | 9 | 81 |
| | | 4 | High | | | | | | | | | | | | | | 0 | 0 |
| | | 5 | Very high | | | | | | | | | | | | | | 0 | 0 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| 2.3.2 | Effects on human health and environment | 1 | Not possible | | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | | | | | | X | | | | X | | 2 | 18 |
| | | 3 | Medium | X | | | X | X | | | X | | X | X | | | 6 | 54 |
| | | 4 | High | | X | X | | | X | | | | | | | | 3 | 27 |
| | | 5 | Very high | | | | | | X | | | | | | | | 0 | 0 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| 2.3.3 | Potential uses | 1 | Not possible | | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | | | | | | | | | | | | 0 | 0 |
| | | 3 | Medium | | | | X | X | | X | X | | X | X | X | | 7 | 63 |
| | | 4 | High | X | X | X | | | | | | | | | | | 3 | 27 |
| | | 5 | Very high | | | | | | X | | | | | | | | 1 | 9 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| 2.3.4 | Protective measures | 1 | Not possible | | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | X | | | | | X | | | | | X | | 3 | 27 |
| | | 3 | Medium | | | | X | | | | X | | X | | | | 4 | 36 |
| | | 4 | High | X | | X | | X | | | | | | | | | 3 | 27 |
| | | 5 | Very high | | | | | | X | | | | | | | | 1 | 9 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| 2.3.5 | Regulations | 1 | Not possible | | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | | | | | | | | | X | | 1 | 9 | |
| | | 3 | Medium | | X | | X | X | | X | X | | X | | X | 7 | 63 | |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Total | % |
|------|---|-------|-----------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-------|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| | | 4 | High | X | | X | | | | | | | | | | 2 | 18 |
| | | 5 | Very high | | | | | | X | | | | | | | 1 | 9 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.4 | Popular modes of chemical information dissemination | 1 | Electronic | | X | | | X | | | | | | | | 2 | 20 |
| | | 2 | Print media | X | | X | X | | X | X | | | X | X | x | 8 | 80 |
| | TOTAL | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | | 1 | 1 | 1 | 10 | 100 |
| 2.5 | Awareness of GHS on Classification & Labelling of Chemicals | 1 | Yes | | | X | X | | X | X | | | | X | | 5 | 50 |
| | | 2 | No | X | X | | | X | | | | | X | | X | 5 | 50 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 10 | 100 |
| 2.6 | Has any work started on GHS implementation | 1 | Not aware | X | X | | | X | X | X | | | X | | X | 7 | 63 |
| | | 2 | Slightly aware | | | | X | | | X | | | | X | | 3 | 27 |
| | | 3 | Very much aware | | | X | | | | | | | | | | 1 | 9 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.7 | Has your institution benefited from any training? | 1 | Not yet | | | X | X | X | | X | | | X | | | 5 | 71 |
| | | 2 | Yes | | | | | | X | | | | | X | | 2 | 28 |
| | Total | | | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 7 | 100 |
| 2.8 | | | | | | | | | | | | | | | | 0 | 0 |
| 2.9 | Presence of Laws ensuring confidentiality of commercial & industrial information | 1 | Yes | | | X | | X | X | X | | | X | X | X | 7 | 63 |
| | | 2 | No | X | X | | X | | | | X | | | | | 4 | 36 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.10 | Is information on chemicals relating to health, safety & environment confidential? | 1 | Yes | X | | X | | X | | X | X | | X | X | | 7 | 63 |
| | | 2 | No | | X | | X | | X | | | | | | X | 4 | 36 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.11 | Extent to which institutions generate scientific information on chemicals & waste management. | 1 | Not aware | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Low | | | | | X | X | X | X | | | | | 4 | 36 |
| | | 3 | Medium | X | X | | X | | | | | | X | | X | 5 | 45 |
| | | 4 | High | | | | | | | | | | | X | | 1 | 9 |
| | | 5 | Very High | | | X | | | | | | | | | | 1 | 9 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.12 | Extent of interface between local institutions and | 1 | Not aware | | | | | | | X | | | | | | 1 | 9 |
| | | 2 | Low | | | | | | X | | | | | | | 1 | 9 |
| | | 3 | Medium | X | X | | X | X | | | | | X | | X | 6 | 54 |
| | | 4 | High | | | X | | | | X | | | | X | | 3 | 27 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Total | % | |
|------|---|-------|-------------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-------|----|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| | policy making bodies | 5 | Very High | | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.13 | Awareness on information on hazard & risk assessments | 1 | No clue | | | | | | X | X | | | X | | | | 3 | 27 |
| | | 2 | Slightly aware | X | X | | X | X | | X | | | | X | | | 6 | 54 |
| | | 3 | Very much aware | | | X | | | | | | | | | X | | 2 | 18 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.14 | If response in 2.13 is 2-3 dissemination; is via | 1 | Personal contacts | | | | | | | | | | | | | | 0 | |
| | | 2 | Informal | | X | | | X | | | | | | | X | | 3 | 37 |
| | | 3 | Formal | X | | X | X | | | X | | | | | | X | 5 | 62 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 8 | 100 |
| 2.15 | Any knowledge of National Environment Standards aimed at reducing chemical/wastes effects | 1 | Yes | X | | X | X | X | X | | X | | X | X | X | | 9 | 81 |
| | | 2 | No | | X | | | | | X | | | | | | | 2 | 18 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.16 | Is there consultation when National Environmental Standards are being set? | 1 | Yes | | | X | X | | | X | | | | X | | | 4 | 36 |
| | | 2 | No | X | X | | | X | X | | X | | X | | X | | 7 | 63 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.17 | Knowledge to international database on chemical safety and risk reduction strategies | 1 | Not at all | | | | | | X | X | X | | X | | | | 4 | 36 |
| | | 2 | Not much | | | X | X | X | | | | | | | | | 3 | 27 |
| | | 3 | Moderate | X | X | | | | | | | | | X | X | | 4 | 36 |
| | | 4 | Considerable | | | | | | | | | | | | | | 0 | 0 |
| | | 5 | Very much | | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.18 | Extent of involvement in providing inputs, information, financial; to efforts to reduce unsound management of chemicals | 1 | Not at all | | | | | | X | X | | | | | | | 2 | 18 |
| | | 2 | Not much | | X | | | X | | X | | | X | | | | 4 | 36 |
| | | 3 | Moderate | X | | X | X | | | | | | | X | | | 4 | 36 |
| | | 4 | Considerable | | | | | | | | | | | | X | | 1 | 9 |
| | | 5 | Very much | | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 2.19 | If score in 2.18 is 1-2; describe the problem | | | | | | | | | X | | | | | | | 0 | 0 |
| 2.20 | Knowledge & information on | 1 | Not at all | | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Not much | | X | | | | | X | X | | X | | | | 4 | 36 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Total | % | |
|---|---|-------|--------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-------|----|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| | the role of chemicals and waste conventions | 3 | Moderate | | | | | X | X | | | | | X | X | 4 | 36 | |
| | | 4 | Considerable | X | | X | X | | | | | | | | | | 3 | 27 |
| | | 5 | Very much | | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |

8.3 Governance

Table 8.7: Response from key Ministries and agencies regarding governance

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Tot. | % |
|-------|--|-------|-------------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| 3.1 | Promotion of sound management programs for chemicals and waste | 1 | Not apply | | | | | | | X | X | | | 2 | 20 |
| | | 2 | Not a priority | | | | | | | | | | | 0 | 0 |
| | | 3 | Low | | | | | | | | | | | 0 | 0 |
| | | 4 | Moderate | X | | X | | X | | | | | x | 4 | 40 |
| | | 5 | Very much | | X | | X | | X | | | x | | 4 | 40 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 3.2 | Your institution's working with other sectors in Govt in promoting sound chemicals mgt to all sectors | 1 | Not at all | | | | | | | X | X | | | 2 | 20 |
| | | 2 | To some extent | X | | X | | X | X | | | x | x | 6 | 60 |
| | | 3 | Very much | | X | | X | | | | | | | 2 | 20 |
| | | TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| 3.3 | Your institution's working with other sectors in Govt & Stakeholders in identifying priorities to chemicals mgt activities | 1 | Not at all | | X | | | | | X | X | | | 3 | 30 |
| | | 2 | To some extent | X | | X | | X | X | | | x | X | 6 | 60 |
| | | 3 | Very much | | | | X | | | | | | | 1 | 10 |
| | | TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| 3.4 | If score in 3.3 is 2-3; who provided training on how to identify priorities | 1 | NGO | | | | | | | | | | | 0 | 0 |
| | | 2 | Regional org | | | | | | | | | | | 0 | 0 |
| | | 3 | International org | | | X | X | X | X | | | | | 4 | 50 |
| | | 4 | Govt | X | | | | X | | | | x | x | 4 | 50 |
| | | TOTAL | | | | 1 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 1 |
| 3.5 | Is your institution aware on how | 1 | Not at all | | | | | | | | | | | 0 | 0 |
| | | 2 | Not much | | | | | | | X | | | | 1 | 10 |
| | | 3 | Moderate | X | | | | | | | X | x | X | 4 | 40 |
| | | 4 | Considerable | | | X | | X | | | | | | 2 | 20 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Tot. | % |
|------|--|-------|----------------|--------------|-----|-----|-----|-----|-----|-----|-----------|-----|------|------|-------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| | national laws & regulations are enforced? | 5 | Very much | | X | | X | | X | | | | | 3 | 30 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 3.6 | Comments | | | | | | | | | | | | | | |
| 3.7 | Your knowledge of “corporate environment & social responsibility” concept | 1 | Not at all | | x | | | | | | | | X | 2 | 20 |
| | | 2 | To some extent | X | | X | X | X | | X | X | X | | 7 | 70 |
| | | 3 | Very much | | | | | | X | | | | | 1 | 10 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 3.8 | If score in 3.7 is 2-3; then rank the corporate community in observing, promoting relevant codes of conduct, including the concept | 1 | Low | X | | | X | | | | X | | | 3 | 33.3 |
| | | 2 | Moderate | | X | x | | X | X | X | | X | | 6 | 66.7 |
| | | 3 | High | | | | | | | | | | | 0 | 100.0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 9 | |
| 3.9 | Involvement of women in decision making on chemicals policy and mgt. | 1 | Not at all | | | | | | | | X | | | 1 | 10 |
| | | 2 | To some extent | X | X | x | X | | | | | | | 4 | 40 |
| | | 3 | Very much | | | | | X | X | X | | X | X | 5 | 50 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 3.10 | Reasons | | | | | | | | | | Political | | | | |
| 3.11 | Knowledge of the need to promote mutual support between trade & environmental policies | 1 | Not at all | | X | | | X | | | | | | 2 | 20 |
| | | 2 | To some extent | | | X | | | | | | X | X | 3 | 30 |
| | | 3 | Very much | X | | | X | | X | X | X | | | 5 | 50 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 3.12 | If score in 3.11 is 2-3; | 1 | Not at all | | x | X | | | | X | X | X | x | 6 | 75 |
| | | 2 | To some extent | | | | | | X | | | | | 1 | 12.5 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Tot. | % |
|------|--|-------|-------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| | state your extent of involvement | 3 | Very much | X | | | | | | | | | | 1 | 12.5 |
| | Total | | | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 100 |
| 3.13 | If score in 3.12 is 2-3; describe your participation | 1 | Passive | | X | | | | | | | | | 1 | 25 |
| | | 2 | Active | X | | | | | X | | | | | 2 | 50 |
| | | 3 | Very active | | | | X | | | | | | | 1 | 25 |
| | Total | | | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 4 | 100 |
| 3.14 | Knowledge of the incentives which support business to develop & improve products that advance strategic approach to chemicals mgt. | 1 | Not aware | X | X | X | X | X | | X | X | X | X | 9 | 90 |
| | | 2 | Aware | | | | | | X | | | | | 1 | 10 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 3.15 | Awareness of conventions | 1 | Aware | X | X | X | X | X | X | | | x | | 7 | 70 |
| | | 2 | Not aware | | | | | | | X | X | | x | 3 | 30 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 3.16 | Extent to which Focal points of the above conventions interact | 1 | Not aware | | | | | X | | X | | X | X | 4 | 44.4 |
| | | 2 | Passive | | | | X | | | | X | | | 2 | 22.2 |
| | | 3 | Active | X | X | | | | X | | | | | 3 | 33.3 |
| | | 4 | Very active | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 99.9 |
| 3.17 | Extent to which your institution liaises closely with other stakeholders' management of chemicals & waste. | 1 | Not aware | | | | | | | | | | | | |
| | | 2 | Passive | | | | | | | X | X | | X | 3 | 33.3 |
| | | 3 | Active | X | X | | X | X | X | | | X | | 6 | 66.7 |
| | | 4 | Very active | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100. |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Tot. | % | |
|------|--|-------|--------------|--------------|-------|-----|-----|--------|-------|-----------------|-----|-----|------|------|-------|------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | | |
| | | | | | | | | | | | | | | | 0 | |
| 3.18 | If your score in 3.17 is 2-4; how do you participate with other stakeholders | 1 | Informal | | | | | | | | X | | X | 2 | 22.2 | |
| | | 2 | Formal | X | X | | X | X | X | X | | X | | | 7 | 77.7 |
| | | Total | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100 |
| 3.19 | What is the name of the structure referred to in 3.18? | | | DC CB | DC CB | | | D cc b | DC CB | Stds Co mmittee | | | | | | |
| 3.20 | Is there multi-sectoral/ multi-stakeholder mechanism to develop NPs & priority action? | 1 | Not aware | | X | | | | | X | | X | X | 4 | 50 | |
| | | 2 | None | | | | | | X | | X | | | 2 | 25 | |
| | | 3 | Yes informal | | | | | | | | | | | 0 | 0 | |
| | | 4 | Yes formal | X | | | X | | | | | | | 2 | 25 | |
| | Total | | | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 100 | |
| 3.21 | Knowledge on how international agreements are ratified via the National system | 1 | Not aware | | | | | | | | X | x | X | 3 | 33.3 | |
| | | 2 | Aware | X | X | | X | X | X | X | | | | 6 | 66.7 | |
| | | Total | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100.0 | |
| 3.22 | Knowledge on how international agreements are domesticated into National laws | 1 | Not aware | | | | | | | | X | X | x | 3 | 33.3 | |
| | | 2 | Aware | X | X | | X | X | X | X | | | | 6 | 66.7 | |
| | | Total | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100.0 | |
| 3.23 | Knowledge of the | 1 | Not aware | | | | | | X | X | X | x | X | 5 | 55.6 | |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Tot. | % |
|------|---|-------|-------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| | national Focal Points for various Chemicals & waste conventions | 2 | Aware | X | X | | X | X | | | | | | 4 | 44.4 |
| | Total | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100.0 |
| 3.24 | How is coordination amongst the focal points effected? | 1 | No idea | | X | | | | | X | X | X | x | 5 | 55.6 |
| | | 2 | Ad hoc | X | | | X | X | X | | | | | 4 | 44.4 |
| | | 3 | Informal | | | | | | | | | | | 0 | 0 |
| | | 4 | Formal | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 100 |
| 3.25 | If score in 3.24 is 4; name the structure | | | | | | | | | | | | | | |

Table 8.8: Response from other stakeholders regarding governance

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | % | |
|-------|--|-------|-------------------|--------------|---|---|---|---|-----------------|---|---|---|----|----|----|----|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| 3.1 | Promotion of sound management programs for chemicals and waste | 1 | Not apply | | X | | | | | | | | | | | 1 | 9 |
| | | 2 | Not a priority | | | | | X | | X | | | | X | | 3 | 27 |
| | | 3 | Low | | | | X | | | | | X | | | | 2 | 18 |
| | | 4 | Moderate | | | | X | | | | X | | | X | | 3 | 27 |
| | | 5 | Very much | X | | X | | | | | | | | | | 2 | 18 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 3.2 | Your institution's working with other sectors in Govt in promoting sound chemicals mgt to all sectors | 1 | Not at all | | X | | | | X | | X | | X | | | 4 | 36 |
| | | 2 | To some extent | X | | | X | X | | X | | | | | X | 5 | 45 |
| | | 3 | Very much | | | X | | | | | | | | | X | 2 | 18 |
| | | TOTAL | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 |
| 3.3 | Your institution's working with other sectors in Govt & Stakeholders in identifying priorities to chemicals mgt activities | 1 | Not at all | X | X | | | | X | | | | | | | 5 | 50 |
| | | 2 | To some extent | | | X | X | | | | | | | X | X | 4 | 40 |
| | | 3 | Very much | | | | | | | X | | | | | | 1 | 10 |
| TOTAL | | | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 10 | 100 |
| 3.4 | If score in 3.3 is 2-3; who provided training on how to identify priorities | 1 | NGO | | | | | | | | X | | | | | 1 | 16 |
| | | 2 | Regional org | | | | | | | | | | | | | 0 | 0 |
| | | 3 | International org | | | X | | | | | | | | X | | 2 | 33 |
| | | 4 | Govt | | | | X | X | | | | | | | X | 3 | 50 |
| TOTAL | | | | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 6 | 100 |
| 3.5 | Is your institution aware on how national laws & regulations are enforced? | 1 | Not at all | | | | | | | | | | | | | 0 | 0 |
| | | 2 | Not much | | X | | | | | X | | | | | | 2 | 18 |
| | | 3 | Moderate | X | | | X | X | X | | X | | | | X | 6 | 54 |
| | | 4 | Considerable | | | | | | | | | | | X | | 1 | 9 |
| | | 5 | Very much | | | X | | | | | | | X | | | 2 | 18 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 3.6 | Comments | | | | | | | | Low enforcement | X | | | | | | | |
| 3.7 | Your knowledge of "corporate environment & social responsibility" concept | 1 | Not at all | | | | | X | | X | | | | | | 2 | 18 |
| | | 2 | To some extent | X | X | X | X | | | | X | | | | | 5 | 45 |
| | | 3 | Very much | | | | | | X | | | | X | X | X | 4 | 36 |
| Total | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 3.8 | If score in 3.7 | 1 | Low | | | | X | | | | X | | X | | | 3 | 33 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | % | |
|------|--|-------|----------------|--------------|---|---|---|---|---|---|---|---|----|----|----|----|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| | is 2-3; then rank the corporate community in observing, promoting relevant codes of conduct, including the concept | 2 | Moderate | X | | | | X | | | | | | X | X | 4 | 44 |
| | | 3 | High | | | X | | | X | | | | | | | 2 | 22 |
| | | Total | | | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 9 |
| 3.10 | Involvement of women in decision making on chemicals policy and mgt. | 1 | Not at all | | | | | | | | | | | | | 0 | 0 |
| | | 2 | To some extent | X | | X | | | X | | | X | | | X | 6 | 54 |
| | | 3 | Very much | | X | | X | X | | | X | | | X | | 5 | 45 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 3.11 | Reasons | | | | | | | | | | | | | | | | |
| 3.12 | Knowledge of the need to promote mutual support between trade & environmental policies | 1 | Not at all | | | | | | | | X | | X | | | 2 | 18 |
| | | 2 | To some extent | X | X | | | X | X | | X | | | | X | 6 | 54 |
| | | 3 | Very much | | | X | X | | | | | | | X | | 3 | 27 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| 3.13 | If score in 3.11 is 2-3; state your extent of involvement | 1 | Not at all | | | | | | | | X | | | | | 1 | 10 |
| | | 2 | To some extent | | | X | X | X | X | | X | | | X | | 6 | 60 |
| | | 3 | Very much | X | X | | | | | | | | | | X | 3 | 30 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 10 | 100 |
| 3.14 | If score in 3.12 is 2-3; describe your participation | 1 | Passive | | | | | | | X | | | | | | 1 | 12 |
| | | 2 | Active | X | | X | X | | X | | | | | X | X | 6 | 75 |
| | | 3 | Very active | | X | | | | | | | | | | | 1 | 12 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 8 | 100 |
| 3.15 | Knowledge of the incentives which support business to develop & improve products that advance strategic approach to chemicals mgt. | 1 | Not aware | | X | X | X | X | X | X | X | | X | X | | 9 | 90 |
| | | 2 | Aware | | | | | | | | | | | | X | 1 | 10 |
| | Total | | | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 10 | 100 |
| 3.16 | Awareness of conventions | 1 | Aware | X | | | X | | | | | | | X | | 3 | 27 |
| | | 2 | Not aware | | | | | X | | | | | | | | 1 | 9 |

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | % | | | |
|------|--|-------|--------------|--------------|---|---|---|---|---|---|---|---|----|----|----|---|----|-----|----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | | |
| | | 3 | Partly aware | | X | X | | | X | | X | X | | X | | X | 7 | 63 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| 3.17 | Extent to which your institution liaises closely with other stakeholders' management of chemicals & waste. | 1 | Not aware | | | | | | X | | | X | | | X | | 3 | 27 | |
| | | 2 | Passive | | X | X | X | X | | | X | | | X | | X | | 7 | 63 |
| | | 3 | Active | X | | | | | | | | | | | | | | 1 | 10 |
| | | 4 | Very active | | | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 11 | 100 | |
| 3.18 | Extent to which your institution liaises closely with other stakeholders' management of chemicals & waste. | 1 | Not at all | | | | | | | | X | | | | | | 1 | 10 | |
| | | 2 | Passive | | X | | X | | X | | | | | | | X | | 4 | 40 |
| | | 3 | Active | X | | | | | | | X | | | X | | | | 3 | 30 |
| | | 4 | Very active | | | | X | | | | | | | | X | | | 2 | 20 |
| | Total | | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 3.19 | If your score in 3.17 is 2-4; how to you participate with other stakeholders | | | | | | | | | | | | | | | | | | |
| | | 1 | Informal | | | | | | X | | | | | | | | | 1 | 12 |
| | | 2 | Formal | X | | X | X | | | | X | | | X | X | X | | 7 | 88 |
| | Total | | | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 8 | 100 | |
| 3.20 | Name of Structure | | Local govt | | | | | | | | | | | | | | | | |
| 3.21 | Multisectoral or multi-stakeholder mechanisms to develop national profiles and priority actions | 1 | Not aware | | X | | | X | X | | X | | X | X | | | 6 | 55 | |
| | | 2 | None | | | | | | | | X | | | | | | 1 | 9 | |
| | | 3 | Yes informal | | | X | X | | | | | | | | | | 2 | 18 | |
| | | 4 | Yes formal | X | | | | | | | | | | | | X | 2 | 18 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 11 | 100 | |
| 3.22 | Knowledge on how international agreements are domesticated into National laws | | | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | X | | X | X | X | | | | | | | | | 4 | 37 |
| | | 2 | Aware | X | | X | | | | | X | X | | X | X | X | | 7 | 63 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 11 | 100 | |
| 3.23 | Knowledge on how international agreements are domesticated into National laws | | | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | X | | X | X | X | | | X | | | | | | 6 | 55 |
| | | 2 | Aware | X | | X | | | | | X | | | | X | X | | 5 | 45 |

| Q | Description | Scale. | Description | Stakeholders | | | | | | | | | | | | % | | |
|------|--|--------|-------------|--------------|---|---|---|---|---|---|---|---|----|----|----|----|-----|----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 100 | |
| 3.24 | Knowledge of the national Focal Points for various Chemicals & waste conventions | 1 | Not aware | | X | | | X | X | | | | | | | 4 | 37 | |
| | | 2 | Aware | X | | X | X | | | | X | | | X | X | X | 7 | 63 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| 3.25 | | 1 | No idea | | X | | X | X | X | | X | | | | | 5 | 46 | |
| | | 2 | Ad hoc | | | X | | | | | X | | | | | | 2 | 18 |
| | | 3 | Informal | | | | | | | | | | | | | | 0 | 0 |
| | | 4 | Formal | X | | | | | | | | | | X | X | X | 4 | 36 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| 3.26 | How is coordination amongst the focal points effected | | | | | | | | | | | | | | | | | |

8.4 Capacity building and technical cooperation

Table 8.9: Response from key Ministries regarding capacity building and cooperation

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Tot | % |
|-----|---------------------|-------|------------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | |
| 4.1 | Chemicals mgt | | | | | | | | | | | | | | |
| | | 1 | None | | X | | | X | | X | X | | | 4 | 40 |
| | | 2 | Low | X | | x | | | | | | X | X | 4 | 40 |
| | | 3 | Moderate | | | | X | | X | | | | | 2 | 20 |
| | | 4 | High | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| | Waste mgt | | | | | | | | | | | | | | |
| | | 1 | None | | X | | | X | | X | X | | X | 5 | 50 |
| | | 2 | Low | X | | | | | | | | X | | 2 | 20 |
| | | 3 | Moderate | | | | X | | X | | | | | 2 | 20 |
| | | 4 | High | | | X | | | | | | | | 1 | 10 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 4.2 | Information Source | | | | | | | | | | | | | | |
| | | 1 | Website searches | X | X | | X | | | | | x | | 4 | 26 |
| | | 2 | UN | X | | X | X | X | X | X | | | | 6 | 40 |
| | | 3 | Foreign Embs | | | | | | | | | | | 0 | 0 |
| | | 4 | Govt Ministries | | | | X | X | | X | | X | X | 5 | 34 |
| | Total | | | 2 | 1 | 1 | 3 | 2 | 1 | 2 | 0 | 2 | 1 | 15 | 100 |
| 4.3 | Role of conventions | | | | | | | | | | | | | | |
| | | 1 | None at all | | | | | | | | | | | | |
| | | 2 | Not much | | | | | | X | X | x | x | | 4 | 40 |
| | | 3 | Moderate | | | X | | X | X | | | | | 3 | 30 |
| | | 4 | Considerable | X | X | | X | | | | | | | 3 | 30 |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |

Table 8.10: Response from other stakeholders regarding capacity building and cooperation

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | | | Tot | % | |
|-----|---------------------|-------|-------------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-----|----|-----|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| 4.1 | Chemicals mgt | | | | | | | | | | | | | | | | | |
| | | 1 | None | | | | | | | | | | X | | | | 1 | 9 |
| | | 2 | Low | X | X | X | | | | | | x | | | | | 4 | 36 |
| | | 3 | Moderate | | | | X | X | | X | | | | | X | | 4 | 36 |
| | | 4 | High | | | | | | X | | | | | X | | | 2 | 19 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |
| | Waste mgt | | | | | | | | | | | | | | | | | |
| | | 1 | None | | | | | | | X | | | X | | | | 2 | 19 |
| | | 2 | Low | | X | X | | | | | X | | | | | | 3 | 27 |
| | | 3 | Moderate | | | | X | X | X | | | | | | X | | 4 | 36 |
| | | 4 | High | X | | | | | | | | | | X | | | 2 | 18 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 11 | 100 |
| 4.2 | Information Source | | | | | | | | | | | | | | | | | |
| | | 1 | Website searches | X | | X | X | X | | | X | | X | X | | | 7 | 35 |
| | | 2 | UN | | | X | | | | | X | X | | | X | | 4 | 20 |
| | | 3 | Foreign Embs | | | X | | | X | | | | | | | | 2 | 10 |
| | | 4 | Govt / Ministries | X | X | X | X | X | | | | | | | X | X | 7 | 35 |
| | Total | | | 2 | 1 | 4 | 2 | 2 | 1 | 1 | 2 | 0 | 1 | 3 | 1 | 1 | 20 | 100 |
| 4.3 | Role of conventions | | | | | | | | | | | | | | | | | |
| | | 1 | None at all | | | | | | | | X | | | | | | 1 | 9 |
| | | 2 | Not much | | | X | | | | | X | | X | | | | 3 | 27 |
| | | 3 | Moderate | | X | | | X | X | | | | | X | X | | 5 | 45 |
| | | 4 | Considerable | X | | | X | | | | | | | | | | 2 | 19 |
| | | 5 | Very much | | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 11 | 100 |

8.5 Illegal international traffic

Table 8.11: Response from key Ministries regarding Illegal International Traffic

| Q | Description | Scale | Description | Stakeholders | | | | | | | | | | Tot | % | |
|----------|-------------------------|----------------|----------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|------|
| | | | | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 | | | |
| 5.1 | Illegal Traffic Basel | | | | | | | | | | | | | | | |
| | | 1 | Nothing at all | | | | | | | | X | | | x | 2 | 20 |
| | | 2 | Very low | | | | | | | | | X | x | | 2 | 20 |
| | | 3 | Low | | X | | X | X | | | | | | | 3 | 30 |
| | | 4 | Moderate | X | | | | | | X | | | | | 2 | 20 |
| | | 5 | High | | | X | | | | | | | | | 1 | 10 |
| | | Total | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| | Stockholm | | | | | | | | | | | | | | | |
| | | 1 | Nothing at all | | | | | | | | X | | | x | 2 | 20 |
| | | 2 | Very low | | | | | | | | | X | x | | 2 | 20 |
| | | 3 | Low | | X | | | X | | | | | | | 2 | 20 |
| | | 4 | Moderate | X | | X | | | | X | | | | | 3 | 30 |
| | | 5 | High | | | | X | | | | | | | | 1 | 10 |
| | | Total | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| | Rotterdam | | | | | | | | | | | | | | | |
| | | 1 | Nothing at all | | | | | | | | X | | | x | 2 | 20 |
| 2 | | Very low | | | | | | | | | X | x | | 2 | 20 | |
| 3 | | Low | | X | | | X | | | | | | | 2 | 20 | |
| 4 | | Moderate | X | | X | | | | X | | | | | 3 | 30 | |
| 5 | | High | | | | X | | | | | | | | 1 | 10 | |
| | Total | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| Montreal | | | | | | | | | | | | | | | | |
| | 1 | Nothing at all | | | | | | | | X | | | x | 2 | 20 | |
| | 2 | Very low | | | | | | | | | X | x | | 2 | 20 | |
| | 3 | Low | | X | | X | X | | | | | | | 3 | 30 | |
| | 4 | Moderate | X | | | | | | X | | | | | 2 | 20 | |
| | 5 | High | | | X | | | | | | | | | 1 | 10 | |
| | Total | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 | |
| 5.2 | Govt domesticated Basel | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | | | | | | | X | X | | x | 3 | 30 |
| | | 2 | Very low | | | | | | | | | | x | | 1 | 10 |
| | | 3 | Low | | X | | | | | | | | | | 1 | 10 |
| | | 4 | Moderate | X | | | X | X | X | | | | | | 4 | 40 |
| | | 5 | High | | | X | | | | | | | | | 1 | 10 |
| | | Total | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| | Stockholm | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | | | | | | | X | X | | x | 3 | 33.3 |
| | | 2 | Very low | | | | | | | | | | | | | |
| 3 | | Low | | X | | | X | | | | | | | 2 | 22.3 | |
| | Total | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 9 | 100 | | |
| | Total | | | | | | | | | | | | | | | |
| | Rotterdam | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|-----|-------------|---|--------------|---|---|---|---|---|---|---|---|---|---|----|-----|
| | | 1 | Not aware | | | | | | | X | X | x | x | 4 | 40 |
| | | 2 | Very low | | | | | | | | | | | 0 | 0 |
| | | 3 | Low | | X | | | | | | | | | 1 | 10 |
| | | 4 | Moderate | X | | X | X | X | X | | | | | 5 | 50 |
| | | 5 | High | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| | Montreal | | | | | | | | | | | | | | |
| | | 1 | Not aware | | | | | | | X | X | x | x | 4 | 40 |
| | | 2 | Very low | | | | | | | | | | | 0 | 0 |
| | | 3 | Low | | X | | | | | | | | | 1 | 10 |
| | | 4 | Moderate | | | | X | X | X | | | | | 3 | 30 |
| | | 5 | High | X | | X | | | | | | | | 2 | 20 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 | 100 |
| 5.3 | Shared info | | | | | | | | | | | | | | |
| | | 1 | Not aware | | X | | X | X | X | X | | x | x | 7 | 79 |
| | | 2 | Low | X | | | | | | | | | | 1 | 11 |
| | | 3 | Moderate | | | X | | | | | | | | 1 | 11 |
| | | 4 | High | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 9 | 100 |
| 5.4 | Roles | | | | | | | | | | | | | | |
| | | 1 | Not aware | | | | | X | | X | | x | x | 4 | 44 |
| | | 2 | Not much | | X | | | x | | X | | | | 3 | 33 |
| | | 3 | Moderate | | | | | | | | | | | 0 | 0 |
| | | 4 | Considerable | x | | X | | | | | | | | 2 | 23 |
| | | 5 | Very much | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 9 | 100 |

Table 8.12 : Response from other stakeholders regarding Illegal International Traffic

| Q | Description | | | Stakeholders | | | | | | | | | | | | Tot | % | |
|----------|-------------------------|----------------|----------------|--------------|---|---|---|---|---|---|---|---|----|----|----|-----|-----|--|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| 5.1 | Illegal Traffic Basel | | | | | | | | | | | | | | | | | |
| | | 1 | Nothing at all | | | | | | | | X | | | | | 1 | 9 | |
| | | 2 | Very low | | | | | X | | X | | | | | | 2 | 19 | |
| | | 3 | Low | | X | X | X | | | | | | | X | | 4 | 36 | |
| | | 4 | Moderate | X | | | | | X | | | | X | | X | 4 | 36 | |
| | | 5 | High | | | | | | | | | | | | | 0 | 0 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 | |
| | Stockholm | | | | | | | | | | | | | | | | | |
| | | 1 | Nothing at all | | | | | | | | X | | | | | 1 | 10 | |
| | | 2 | Very low | | | | | X | | X | | | | | | 2 | 20 | |
| | | 3 | Low | | X | X | X | | | | | | | X | | 4 | 40 | |
| | | 4 | Moderate | X | | | | | X | | | | | | X | 3 | 30 | |
| | | 5 | High | | | | | | | | | | | | | 0 | 0 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 10 | 100 | |
| | Rotterdam | | | | | | | | | | | | | | | | | |
| | | 1 | Nothing at all | | | | | | X | | X | | | | | 2 | 20 | |
| | | 2 | Very low | | | | | X | | | | | | | | 1 | 10 | |
| | | 3 | Low | | X | X | X | | | X | | | | X | | 5 | 50 | |
| 4 | | Moderate | X | | | | | | | | | | | X | 2 | 20 | | |
| 5 | | High | | | | | | | | | | | | | 0 | 0 | | |
| Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 10 | 100 | | |
| Montreal | | | | | | | | | | | | | | | | | | |
| | 1 | Nothing at all | | | | | | X | | X | | | | | 2 | 20 | | |
| | 2 | Very low | | | | | | | | | | | | | 0 | 0 | | |
| | 3 | Low | | X | X | X | | | | | | | X | | 4 | 40 | | |
| | 4 | Moderate | X | | | | | X | | X | | | | X | 4 | 40 | | |
| | 5 | High | | | | | | | | | | | | | 0 | 0 | | |
| Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 10 | 100 | | |
| 5.2 | Govt domesticated Basel | | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | X | | X | | X | X | | | | | | 4 | 36 | |
| | | 2 | Very low | | | | | | | | X | | | | | 1 | 9 | |
| | | 3 | Low | | | | | X | | | | | | | | 1 | 9 | |
| | | 4 | Moderate | X | | X | | | | | | | | X | | 3 | 27 | |
| | | 5 | High | | | | | | | | | X | X | | | 2 | 19 | |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 11 | 100 | | |
| | Stockholm | | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | X | | X | | | X | X | | | | X | 5 | 56 | |
| | | 2 | Very low | | | | | | | | X | | | | | 1 | 11 | |
| | | 3 | Low | | | | | | | | | | | | | 0 | 0 | |
| | | 4 | Moderate | X | | X | | | | | | | | | | 2 | 22 | |
| | | 5 | High | | | | | | | | | | | X | | 1 | 11 | |
| | Total | | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 | 100 | |
| | Rotterdam | | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | X | | X | | X | X | X | | | | X | 6 | 67 | |
| | | 2 | Very low | | | | | | | | | | | | | 0 | 0 | |
| | | 3 | Low | | | | | | | | | | | | | 0 | 0 | |
| | 4 | Moderate | X | | X | | | | | | | | X | 3 | 33 | | | |

| | | | | | | | | | | | | | | | | | |
|-----|-------------|---|--------------|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|
| | | 5 | High | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 | 100 |
| | Montreal | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | | X | X | | | X | X | X | | | | | 5 | 56 |
| | | 2 | Very low | | | X | | | | | | | | | | 1 | 11 |
| | | 3 | Low | | | | | | | | | | | | | 0 | 0 |
| | | 4 | Moderate | X | | | | | | | | | | X | | 2 | 23 |
| | | 5 | High | | | | | | | | | | | X | | 1 | 11 |
| | Total | | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 | 100 |
| 5.3 | Shared info | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | X | | | | | X | X | X | | | X | | 5 | 50 |
| | | 2 | Low | | | X | | X | | | | | | | | 2 | 20 |
| | | 3 | Moderate | | X | | X | | | | | | | X | | 3 | 30 |
| | | 4 | High | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 10 | 100 |
| 5.4 | Roles | | | | | | | | | | | | | | | | |
| | | 1 | Not aware | x | | | | | X | X | | | | X | | 4 | 36 |
| | | 2 | Not much | | | X | | | X | | | | X | | | 3 | 26 |
| | | 3 | Moderate | | X | | | X | | | | | | | | 2 | 19 |
| | | 4 | Considerable | | | | X | | | | | | | X | | 2 | 19 |
| | | 5 | Very much | | | | | | | | | | | | | 0 | 0 |
| | Total | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 | 100 |

9. Summary of Gap Analysis

The same two categories of stakeholders as used in Sections 7 and 8 apply for this section. They are:

- Category 1: Key ministries and their agencies
- Category 2: Local authorities, chemical importers, manufacturers, exporters, users, academia, media and the NGOs.

9.1 Risk reduction

Issue 1: Knowledge of the impact of chemicals and wastes to human beings and the environment

The statistics showed that most of the respondents were fully aware of the impacts of chemicals and waste to human being and the environment. However this might not be the case for the general public and the risk groups such as small planters. So, more groundwork should be conducted among risk groups to assess the situation and in any case awareness campaigns should be carried out targeting all sectors of the population including in particular, risk groups.

Issue 2: Awareness of measures in the country that protect humans and the environment from exposures to chemicals

Most of the government bodies (category 1) reflected considerable knowledge on the issue (80%). This is mostly due to their involvement in stakeholders' consultation at workshops or to prior training obtained by the organization of the topic. However the 45 % of the stakeholders in Category 2 acknowledged moderate knowledge. Therefore it is recommended that stakeholders of category 2, in particular chemical dealers should be more involved in the national workshops or they should be made aware of existing measures that protect humans and the environment through awareness and information campaigns. In this respect, a register of chemical dealers in the country will be very helpful to the workshop organizers or to the ministries organizing awareness programmes.

Issue 3: National institutions involvement in comprehensive risk management strategies

40 % respondents from the ministries (category 1) perceived considerable involvement of national institutions in the initiative. 20% believe that national institutions were not collaborating on the health and environmental effects. As for the stakeholders of category 2, the respondents complained in the ambiguity of the question, however they declared not much collaboration on social and economic issues (55 %) and considerable (36%) collaboration of national institutions. From the statistics above, it is clear that socio-economic issues are often left out in the process and therefore care should be taken that the social aspect is not excluded.

Issue 4: Awareness of measures in the country that prevent highly toxic chemicals to be produced or used

While a high percentage (70%) of respondents from Category 1 were very aware of the issue, about 63 % of respondents of category 2 were only slightly aware of the measures. It is apparent that more effort should be geared towards setting up of awareness campaigns. The Ministry of Environment and National Development Unit and the Ministry of Local Government can host such campaigns.

Issue 5: Assessment of the category of the measures

The stakeholders from the ministries were more acquainted with legal measures (67%). However, statistics showed that the local authorities and chemical exporters or importers were more conversant of the administrative measures.

Issue 6: Efficiency of the measures

Both groups of stakeholders were of the opinion that the measures were inadequate and therefore more effort should be input to review the measures in the overlapping of the legislations and duplicate responsibilities within the ministries.

Issue 7: Awareness of any incidences of accidental chemical releases

90 % of the respondents from the ministries (category 1) were aware of occurrence of accidents due to chemicals and all other stakeholders (category 2) declared that they were fully aware of past accidents. This is a good indication that communication and dissemination of information regarding this issue is working very well.

Issue 8: Preparedness of the country to address the above (Issue 7) concerning incidences

Both category of stakeholders claimed that the country is moderately prepared to address emergencies related to chemical releases and accidents. It is therefore essential to review the emergency plans and the mode of communication of these plans in the relevant ministries and among other stakeholders so that each of them knows their roles in such situations. Moreover, it is felt that a common harmonized emergency plan should be implemented amongst all stakeholders rather than fragmented pieces specific for each institution.

Issue 9: Sources of information, communication modes

All sources stated were equally consulted among the respondents from ministries (Category 1). On the other hand, most of the respondents (26 - 30 %) of category 2 relied on the national broadcast of information and newspapers, as these were the most accessible modes to them.

Issue 10: Awareness of the Precautionary approach as set out in Principle 15 of the Rio Declaration on Environment and Development

Both groups of stakeholders were highly aware of the approach (77-81 %). This is probably due to the government commitment in fostering a good sustainability culture. In this respect, the dynamic roles of the Ministries of Environment and Local Government in raising awareness on this issue has to be pointed out.

Issue 11: Pollution prevention promotion in your organization

Pollution prevention strategies adopted within the organization were high to moderate for both groups of stakeholders.

Issue 12: Reasons for not promoting

Only 10% respondents were not satisfied with the practices in their companies and 5% stated the reasons as being due to poor culture with regards to pollution.

Issue 13: Country's capacity and readiness to tackle existing, new and emerging issues of global concern

70 % of respondents from ministries and 50 % of respondents from category 2 claimed that the country's capacity and readiness were moderate. None of the respondents from private companies (category 2) believed that the country had high capacity in handling the emerging issues of global concern. This is probably due to the fact that because of human resource and financial constraints, it is difficult for the country to tackle existing, new and emerging issues of global concern at the same time. Another reason to this problem can be the delay in communication between governments and international bodies on scientific evidence of new emerging environmental issues of concern.

Issue 14: Bottlenecks of the country to address the above (Issue 13)

Stakeholders from the ministries agreed on the reasons stated for the bottlenecks (highest being due to administrative capacities) whereas the private bodies and the local authorities were not convinced that the problems were due to administrative reasons, but yet 40% believed in the reasons brought forward in the questionnaire.

Issue 15: Awareness of the type, quantity and toxicity of hazardous waste generated in the country

Both groups of stakeholders (45 – 60 %) were very much aware of the type, quantity and toxicity of hazardous waste generated in the country. The awareness was lowest for the private stakeholders, which again confirms that more awareness should be geared towards the private sectors and risk groups.

Issues 16 - 18: Awareness of the current practice of hazardous waste generation, transport and storage

Statistics in this area showed that the local authorities and chemical dealers were the stakeholders mostly aware of the generation hazardous waste whereas at the level of the ministries, the awareness was moderate. This is a true reflection of the situation since the government has no formal record procedure of hazardous waste generation. Currently, most generators of hazardous wastes are requested to contain their waste and store it on site awaiting a proper infrastructure from the government to manage these wastes. An insignificant amount is accepted at the hazardous waste cell at the Mare Chicose landfill. Presently, no dedicated system for the transport of hazardous waste is in place in

Mauritius. The government is currently undertaking development projects in waste management that would cater for hazardous wastes. As mentioned earlier, it is in the plan of the MoLG to construct an interim hazardous waste facility that will be operational by 2010 and will cater for all hazardous wastes generated in Mauritius including those are now being stored in premises of industries and that are not accepted at Mare Chicose.

Issues 19 and 20: Awareness of the current practice of hazardous waste treatment and disposal

The most preferred methods for treatment were physico-chemical treatments and incineration. About 3000 tons of asbestos has recently been stored in the hazardous waste cell at Mare Chicose landfill. Respondents from the ministries had moderate knowledge on the issue, whereas for the local authorities, public and private bodies were not much aware of how the hazardous wastes need to be transported. This is of serious concern and a proper system transport needs to be put in place. Moreover, the persons involved in the generation, handling, packaging, transport and storage of hazardous wastes should not only be given the appropriate training, but they should also be informed about the harmful effects of these types of wastes.

Issue 21: Awareness of the existence of organizations in the country that recover and recycle hazardous materials and waste

Both categories of stakeholders were moderately aware of the existence of such hazardous waste recyclers. However, the knowledge was lower among the category 2 respondents (only 37 %) as compared to those from ministries (50%). This is indicative that there is low sharing of knowledge between the two categories of stakeholders. Better cooperation and networking should therefore be established to enhance cooperation. More generally, information regarding existing facilities for the recycling of wastes and hazardous wastes in the country should be made aware to the public and in particular to the relevant stakeholders.

Issue 22: Assessment of environment friendliness of the above operations (Issue 21)

Both category of stakeholders believed that the operations were considerably sound for the environment. However this opinion was biased as answers were also received about the operations for respondents who claim no knowledge of the operations.

Issue 23: Awareness of Cleaner Production Concepts

Respondents from both categories claimed moderate to considerable knowledge on the topic. These statistics confirm that the respondents who are mostly at the management levels have received training on the topic whereas this may not be the case for personnel at lower level in the organization.

Issue 24: Awareness of existing organizations in the country that are involved in Research and Development to produce new chemicals or products

The statistics show that both categories of respondents were not aware of such organizations. This could be explained by the fact that research and development regarding chemicals and products is not common in Mauritius.

Issue 25: *Name of organizations (Issue 24) and respondents concerns for the issue*

Names of the following institutions were recorded:

- Mauritius Research Council
- University of Mauritius
- Improchem, South Africa
- MSIRI

Issue 26: *Awareness of role of the chemicals and waste conventions on risk reduction*

Awareness was considerable among the respondents from the ministries whereas it was moderate for the remaining stakeholders. Again this is clear evidence of the lack of sharing of information between the private and the public sector.

Issue 27: *Training obtained and awareness of how to deal with poisoning and chemicals incidences*

Only 30% of the respondents from ministries have received training on the above issue and 50 % are yet to receive such training. 60 % of the respondents from category 2 stakeholders were not aware of any previous training in that direction. This is a major concern, which needs to be addressed urgently.

Issue 28: *Institutions' awareness on risk assessment including management and communication of risks*

The two categories of stakeholders claimed to have little knowledge on risk assessment methodologies and risk management.

Issue 29: *Any training obtained by the institutions related to Issue 28*

Statistics showed that not much training has been conducted in the past.

Issue 30: *Name of institution that conducted the training*

None recorded

Issue 31: *Views expressed by the stakeholders*

Please refer to Section 8 part 2 for views and comments by stakeholders.

9.2 Knowledge and information

Issue 1: *Source of information on chemicals and wastes*

35% of respondents from ministries relied on the government as their source of information on chemicals and chemical waste. However 41 % of respondents from category 2 claimed retrieving data from foreign sources. Reliance on multiple sources was also observed among academia and the media.

Issue 2: Adequacy of information and knowledge on chemicals management in your country

60 to 72 % of respondents from the two categories declared that not much information was available within the organization. To address this problem, the Health and Safety officers in each company should ensure proper dissemination of information and store officers should ensure that any chemical bought is accompanied with a material safety data sheet which need to reach the users of the chemical products utilized. These practices will follow when rigorous sensitization campaigns have been performed on a nation wide basis on hazards and risks associated with mismanagement of chemicals and its wastes.

Issue 3 & 4: Adequacy of the information the organization has on chemicals including chemicals in products: Complexity of the language used in MSDS

Both category of stakeholders perceived that the languages used on safety data sheets are of medium complexity.

Issue 5: Adequacy of information on effects on human health and the environment

Both categories of stakeholders believed that the amount of information provided on the health effects were reasonably adequate (medium rate). Here again ambiguity in the question statement was experienced.

Issue 6: Information of Potential uses of chemicals

Both categories of stakeholders perceived that the amount of information provided on the potential uses were reasonably adequate (medium rate).

Issue 7: Protective measures details on products

Both categories of stakeholders believed that the amount of information provided on products with regards to protective measures were reasonably adequate (medium rate).

Issue 8: Information about regulations related to products

Respondents of category 1 stakeholders believed that information related to regulation on products gave a wide range of answers from low to high. The respondents of the other category were of the opinion that moderate amount of information was provided.

Issue 9: Modes of dissemination of chemical information

Both category of stakeholders claimed that print media was the most common mode of dissemination of chemical information (75 -80 %).

Issue 10: Aware of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

50 – 67 % of the overall stakeholders interviewed were aware of the system of classifications and labelling of chemicals. However, 50 % of the respondents of category 2 were unaware of GHS, which again indicates the disparity of level of awareness regarding information on chemicals between the two categories.

Issue 11: *Awareness of start of work on GHS implementation*

More than 60% unawareness was observed in both cases, which are signs of low training received, and poor disseminations of information.

Issue 12: *Training of personnel of the organization*

The results of the survey show that the respondents from the ministries did not receive any training on this issue. However, a few respondents believed that senior or other staff having already left the ministries might have received that training. To address the problem, it is therefore recommended that regular training opportunities (each five years) be provided to the appropriate working staff. Regarding category 2, 71 % of the respondents did not receive trainings. It is believed that after being trained by the major chemical producers (foreign), the main local chemical suppliers could provide training for small retailers.

Issue 13: *Name of the organization, which conducted this training/awareness programme*

Improchem (South Africa) has been mentioned.

Issue 14: *Awareness of National laws that protect proprietary information for companies*

Stakeholders Category 1: 70 % were not aware

Stakeholders Category 2: 64 % were aware

More information exchange should take place between the policy makers and the other ministerial stakeholders. The policy makers should also work on programmes to sensitize the industries managers and laboratory managers.

Issue 15: *Awareness that the information related to chemical safety is not confidential*

More than 63 % of stakeholders in both categories were aware. However, a higher percentage would have been expected since most of the respondents were at middle or senior managerial level.

Issue 16: *Generation of knowledge and information by scientific institutions*

Stakeholders category 1: 70 % reported that this was low

Stakeholders category 2: 45% believed that it was generated at medium rate

More projects should be initiated in this endeavour by scientific institutions. The Mauritius Research Council has given priority for funding to waste management products. However, local authorities have high dependency on foreign sources mainly due to constraints face by local scientific institutions to do advanced testing, for example to establish dose response relationships of PCBs.

Issue 17: *Interaction of scientific institutions with policy-making bodies*

While stakeholders of category 1 reported low interactions (60%), those of category 2 claimed medium interactions (55 %)

Issues 18 and 19: *Mode of dissemination of Hazardous and risk assessments*

Stakeholders Category 1: 50% claimed of having no clue

Stakeholders Category 2: 54 % were only slightly aware

For both cases informal and formal modes are preferred. To improve the situation, the ministries should receive more training on risk assessment concepts and more people should be involved in the risk assessment exercises conducted. More emphasis can be placed on capacity building projects in small and medium enterprises and for all existing large companies.

Issue 20: *Awareness of existing legislation to protect the human beings and environment from the effects of chemical and waste*

High awareness has been observed from all stakeholders. This is to be expected, since all the ministries interviewed are solicited in policy making and all companies would like to maintain good business by being compliant with the legislations. The academia and media are also fully aware since they are key role players in dissemination of such regulations.

Issue 21: *Knowledge about risk reduction tools*

Stakeholders category 1: 40% not aware at all

Stakeholders category 2: varied between not at all and not much.

These results again confirm the need for training.

Issues 22 and 23: *Effort input in the management of chemicals and chemical waste and reasons for non-cooperation*

For both categories the responses were: not much to moderate. More sensitization is needed for better cooperation.

Issue 24: *Awareness of the role of the Chemicals and waste conventions on knowledge and Information*

As expected the respondents from ministries (category 1) have better knowledge regarding conventions and protocols than respondents of the other category, as they are the stakeholders responsible to implement these at national levels. Moreover, they are also very often the agencies that represent the country at international meetings and workshops organized in the context of these agreements. These ministries have therefore a key role to play to disseminate this information to the public and more specifically to relevant stakeholders such as chemical importers and traders.

9.3 Governance

Issue 1: *Promotion of sound chemicals and waste management within the organization*

Stakeholders Category 1: 40 % moderate to very much promotion among the public sector stakeholders.

Stakeholder Category 2: 27 % believes that it is not a priority and an equal proportion believe it is of moderate priority.

Issue 2: *Collaborations with other sectors in the National Government in promoting integrated programmes*

For both categories 45-60% of respondents state that there is collaboration to some extent with regards to this issue.

Issue 3: *Identifying priorities for chemicals*

While 50% of respondents of category 1 claim that there is very much being undertaken to identify priorities, the same percentage of respondents of category 2 think that prioritization is being considered to some extent. Note that in practice, prioritization is often undertaken upon consultation of all the stakeholders during workshops and short seminars. National committees are also set up to look into pressing issues.

Issue 4: *Name of organization that trained on how to prioritize concerns*

50% of respondent of category 1 answered that training was obtained from international organization and the other 50 % said from the government bodies. For the category 2, 50% claimed to have received training from government and 16% from the NGOs. It should be pointed out that no training was received from regional bodies.

Issue 5: *Knowledge on enforcement of the national laws related to chemicals management*

About 50% of respondents from both stakeholders of category claimed to have moderate knowledge on the issue. Recruitment of skilled personnel who can understand emerging issues of concern should be effected at the level of the ministries. The government should enhance its enforcement capacity by restructuring the enforcement bodies (e.g. Police De L'Environment).

Issue 6: *Awareness of the “corporate environmental and social responsibility” concept*

Stakeholders category 1: 70 % were aware of the concept

Stakeholders category 2: 45% to some extent

Training for public bodies by the National Production Council (NPC) has helped a lot to increase awareness in public sectors. The NPC should organize more of such training sessions for targeted groups.

Issue 7: *Corporate community commitment rating on the Issue 6*

Stakeholders category 1: 67% implemented in public sectors

Stakeholders category 2: 44% responded that it is moderately implemented

Issue 8: *Involvement of women in decision-making and reasons if women not involved*

For both categories, 40% - 54 % responded that women are involved in decision making to some extent. One of the reasons stated was that this was due low political representation of women in our government.

Issues 9,10, 11: *Awareness of the need to promote mutual support between trade and environmental policies and interactions in the process*

The results of the survey show that the level of awareness on this issue was high in the ministries whereas awareness was average for other stakeholders. 75 % of the public sector stakeholders claim having no involvement in this process. The stakeholders of category 2 have reasonable involvement and active participation in the process. This is an example of good culture of cooperation prevailing in the country between the public sector, private sector and scientific bodies as well as media that needs to be enhanced in other areas of chemical and chemical waste management.

Issue 12: *Awareness of incentives in the country, which support businesses to develop and improve products*

Stakeholders category 1: 90 % awareness

Stakeholders category 2: 90 % not aware

These statistics reflect low incentives by the government or other related bodies to develop greener products. The Ministry of Environment can work on schemes to refund partially research projects that develop or improve products.

Issue 13: *Awareness of international conventions related to the chemical and chemical waste management*

Stakeholders category 1: 70 % were aware

Stakeholders category 2: 63 % were partly aware

Issue 14: *Awareness of how the focal points work in collaboration*

Stakeholders category 1: 44 % not aware

Stakeholders category 2: 63 % believe there is passive collaborations

According to information gathered however, there are indications that efforts will be made to foster synergies among the waste and chemical conventions through the Multilateral Environmental Agreement (MEA) Coordinating Committee under the forthcoming amended Environment Protection Act 2002.

Issues 15 to 17: *Collaboration undertaken with the stakeholders to promote sound chemical and waste management, type of collaboration and structure which enables participation*

Stakeholders category 1: 67% active collaborations

Stakeholders category 2: 40 % passive collaborations

Not enough incentives to collaborate may be the reason. No mandatory implementation of environmental standards can also be the cause. The government should look into making environmental report mandatory. The risk audits are specified in the Occupational Health and Safety Legislations, however due to lack of capacity or trained auditors in this area, the legislation cannot be enforced.

Issue 18: *Existence of any multi-sectoral and multi-stakeholder mechanisms to develop national profiles and priority actions in your country*

While stakeholders of category 1 claimed that the Dangerous Chemical Control Board (DCCB) was the body responsible for this issue, stakeholders of category 2 believed that the Ministry of Local Government was providing the mechanism. However the respondents were not too sure of the structure as none of the stakeholders ever declared any of the mechanism above. This mechanism should therefore be reviewed.

Issue 19: *Awareness on how international agreements are ratified through your National system*

63- 67 % of the responded of two categories replied that they were aware about this issue.

Issue 20: *Awareness on how these agreements are domesticated into national laws*

Stakeholders category 1: 67% aware

Stakeholders category 2: 54 % not aware

As expected the ministries are better informed regarding agreements because most of them are solicited in decisions to ratify and to domesticate these into national laws. Awareness of the conventions should follow and reach a greater mass after domestication, rather than slowing down with the dossier once the convention are adopted.

Issue 21: *Awareness of the focal points for the various Chemicals and waste Conventions in your country*

Stakeholders category 1: 56 % not aware

Stakeholders category 2: 63 % aware

Results for stakeholders of category 2 may have been biased due to the misinterpretation of the word “focal point”.

Issues 22 and 23: *Coordination amongst the focal points and structure through which it is effected*

Stakeholders category 1: 56 % no idea of the process

Stakeholders category 2: 45 % no idea of the process

The coordination process is not well known among the stakeholders. The Ministry of Environment and Local Government who are the main focal points can publicize the process through the media.

9.4 Capacity – building and technical cooperation

Issue 1: *Capacity to train other people*

Stakeholders category 1: 40 % no existing capacity to low capacity

Stakeholders category 2: 36 % low to moderate capacity

These are indications that international assistance may be needed.

Issue 2: *Source of information for capacity building*

Stakeholders category 1: 40 % reliance on UN sources

Stakeholders category 2: 35 % on public sector and 35 % on website searches.

Issue 3: *Awareness of the role of the Chemicals and waste conventions on capacity building*

Stakeholders category 1: 40% declared not much awareness on the roles of the conventions on capacity building.

Stakeholders category 2: 45 % declared to have moderate knowledge on the subject

Confirmation that there is need to promote and disseminate information regarding international conventions.

9.5 Illegal international traffic

Issue 1: *Knowledge in the workings of these International treaties aimed at preventing illegal international traffic*

Stakeholders category 1: 30 % low

Stakeholders category 2: 36 % low to moderate

Issue 2: *Level of implementation of the international treaties by the government*

Stakeholders category 1: 40 % declared having moderate knowledge

Stakeholders category 2: most of the respondents declared that they were unaware of the level of implementation

Issue 3: *Degree of sharing of information between governments*

Stakeholders category 1: 78 % not aware; Stakeholders category 2: 50 % not aware

These cases are handled in strict confidentiality and the law enforcement agencies could not comment on such sensitive issues. International consultation can be sought on how these issues are dealt with in other countries

Issue 4: *Awareness of the role of the Chemicals and waste conventions on prevention of illegal International traffic*

Stakeholders category 1: 44% were not aware; Stakeholders category 2: 36 % not aware

The majority of the stakeholders declared “unawareness”, which again confirms the fact that we have rare cases of illegal trafficking, which are again dealt with in strict confidentiality to avoid creating havocs. It should be pointed out that being an island state it is more difficult for illegal international traffic in Mauritius than in non-island states.

10. Summary of relevant areas where projects could be developed as suggested by stakeholders from Questionnaire 3

For this survey only five stakeholders were contacted as Questionnaire 3 was received very late. The five stakeholders were:

- (a) Ministry of Environment & National Development Unit
- (b) Ministry of Local Government
- (c) Ministry of Health & Quality of Life
- (d) Ministry of Labour, Industrial Relations and Employment
- (e) MSIRI

Part 1: Statistical data:

Table 10.1: Possible projects that could be developed in relevant areas

| SAICM AREA | POSSIBLE PROJECTS | PREFERENCE | NO OF STAKEHOLDERS | % |
|----------------|---|-----------------|--------------------|-----|
| | | 1 Not important | | |
| RISK REDUCTION | Building of capacities to deal with poisoning and chemical incidences | 2 Low | 1 | 20 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | | 100 |
| | | 1 Not important | 1 | 20 |
| | Occupational Health and Safety | 2 Low | 0 | 0 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 2 | 40 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | Risk assessment, management and communication | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 2 | 40 |
| | | 4 High | 0 | 0 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | Chemicals of global concern | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 2 | 40 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | Highly toxic pesticides-risk management and reduction | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | Waste management (minimization) | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 3 | 60 |
| | | TOTAL | 5 | 100 |

| SAICM AREA | POSSIBLE PROJECTS | PREFERENCE | NO OF STAKEHOLDERS | % |
|---------------------------|--|-----------------|--------------------|-----|
| | Formulation of prevention and response measures to mitigate environmental and health impacts | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 2 | 40 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | The Role of GHS in risk Reduction | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 3 | 60 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| Knowledge and Information | | 1 Not important | 1 | 20 |
| | Research, monitoring and data management | 2 Low | 0 | 0 |
| | | 3 Moderate | 2 | 40 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | Hazardous data generation and availability | 1 Not important | 1 | 20 |
| | | 2 Low | 0 | 0 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | Globally Harmonized System (GHS) of Classification and Labelling | 1 Not important | 1 | 20 |
| | | 2 Low | 0 | 0 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | Information management and dissemination | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 3 | 60 |
| | | TOTAL | 5 | 100 |
| | Highly toxic pesticides risk management and reduction | 1 Not important | 1 | 20 |
| | | 2 Low | 0 | 0 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 3 | 60 |
| | | TOTAL | 5 | 100 |
| | Life Cycle management | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 3 | 60 |
| | | 4 High | 0 | 0 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | Creation of National and International Registers | 1 Not important | 0 | 0 |

| SAICM AREA | POSSIBLE PROJECTS | PREFERENCE | NO OF STAKEHOLDERS | % |
|------------|---|-----------------|--------------------|-----|
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 3 | 60 |
| | | 5 Very High | 0 | 0 |
| | | TOTAL | 5 | 100 |
| | Use of Indicators to monitor children's environmental health | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 2 | 40 |
| | | 4 High | 0 | 0 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | | | | |
| GOVERNANCE | International Chemicals and waste conventions-promotion of ratification and synergies | 1 Not important | 1 | 20 |
| | | 2 Low | 0 | 0 |
| | | 3 Moderate | 2 | 40 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | Stakeholder participation in decision making processes | 1 Not important | 1 | 20 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 2 | 40 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | Assessment of national chemical management to identify gaps and prioritize action | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 3 | 60 |
| | | TOTAL | 5 | 100 |
| | Implementation of integrated national programmes for sound management of chemicals | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 3 | 60 |
| | | TOTAL | 5 | 100 |
| | GHS (review of national legislation and align with GHS requirements) | 1 Not important | 1 | 20 |
| | | 2 Low | 0 | 0 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | Social and economic considerations | 1 Not important | 1 | 20 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 3 | 60 |

| SAICM AREA | POSSIBLE PROJECTS | PREFERENCE | NO OF STAKEHOLDERS | % |
|---|---|-----------------|--------------------|-----|
| | | 5 Very High | 0 | 0 |
| | | TOTAL | 5 | 100 |
| | Legal, Policy and institutional aspects | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 2 | 40 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | EIAs to include chemicals and hazardous waste | 1 Not important | 0 | 0 |
| | | 2 Low | 2 | 40 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 3 | 60 |
| | | 5 Very High | 0 | 0 |
| | | TOTAL | 5 | 100 |
| | | | | |
| CAPACITY BUILDING AND TECHNICAL COOPERATION | Capacity-building to support national actions | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 0 | 0 |
| | | 5 Very High | 4 | 80 |
| | | TOTAL | 5 | 100 |
| | Formulation of preventive and response measures to mitigate environmental and health impacts of emergencies involving chemicals | 1 Not important | 1 | 20 |
| | | 2 Low | 0 | 0 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 2 | 40 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | Remediation of contaminated sites and poisoned individuals | 1 Not important | 1 | 20 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |
| | Capacity to implement GHS | 1 Not important | 0 | 0 |
| | Waste management | 2 Low | 2 | 40 |
| | | 3 Moderate | 1 | 20 |
| | | 4 High | 1 | 20 |
| | | 5 Very High | 1 | 20 |
| | | TOTAL | 5 | 100 |
| | | | | |
| ILLEGAL AND INTERNATIONAL TRAFFIC | Prevention of illegal traffic in toxic and dangerous goods | 1 Not important | 0 | 0 |
| | | 2 Low | 1 | 20 |
| | | 3 Moderate | 0 | 0 |
| | | 4 High | 2 | 40 |
| | | 5 Very High | 2 | 40 |
| | | TOTAL | 5 | 100 |

Part 2: Summary of preferred projects

Table 10.2: Response of survey regarding summary of preferred projects

| SAICM AREA | Possible Projects | Very high or High % |
|---|---|---------------------|
| RISK REDUCTION | Building of capacities to deal with poisoning and chemical incidences | 60 % |
| | Occupational Health and Safety | 60% |
| | Risk assessment, management and communication | 40% |
| | Chemicals of global concern | 60% |
| | Highly toxic pesticides-risk management and reduction | 60% |
| | Waste management (minimization) | 80% |
| | Formulation of prevention and response measures to mitigate environmental and health impacts | 80% |
| | The Role of GHS in risk Reduction | 80% |
| KNOWLEDGE AND INFORMATION | Research, monitoring and data management | 40% |
| | Hazardous data generation and availability | 60% |
| | Globally Harmonized System (GHS) of Classification and Labelling | 60% |
| | Information management and dissemination | 80% |
| | Highly toxic pesticides risk management and reduction | 80% |
| | Life Cycle management | 20% |
| | Creation of National and International Registers | 60% |
| | Use of Indicators to monitor children's environmental health | 40% |
| GOVERNANCE | International Chemicals and waste conventions-promotion of ratification and synergies | 40% |
| | Stakeholder participation in decision making processes | 60% |
| | Assessment of national chemical management to identify gaps and prioritize action | 80% |
| | Implementation of integrated national programmes for sound management of chemicals | 80% |
| | GHS (review of national legislation and align with GHS requirements) | 60% |
| | Social and economic considerations | 60% |
| | Legal, Policy and institutional aspects | 60% |
| | EIAs to include chemicals and hazardous waste | 60% |
| CAPACITY BUILDING AND TECHNICAL COOPERATION | Capacity-building to support national actions | 80% |
| | Formulation of preventive and response measures to mitigate environmental and health impacts of emergencies involving chemicals | 80% |
| | Remediation of contaminated sites and poisoned individuals | 60% |
| | Capacity to implement GHS | 40% |
| | Waste management | 40% |
| ILLEGAL AND INTERNATIONAL TRAFFIC | Prevention of illegal traffic in toxic and dangerous goods | 80% |

Comments on the choices above:

The most preferred project was that of developing Capacity Building and Technical Cooperation to support national actions followed by waste minimization needs. There was general consensus regarding need for networking between the different stakeholders through projects that would enhance cooperation. A strong need was also felt to fill the data gaps such as a complete inventory of the chemical waste generated by the relevant sectors.

11. Comments on the outline of the training from country experts (From questionnaire 4)

While drafting the report, it was observed that **Questionnaire 4 was missing** amongst the documents sent by BCRC, however we managed to give comments for this Section.

The need for chemical and chemical waste management has been prompted on the chemical agenda quite recently. Most of the stakeholders interviewed were informed about the risk of improper management of hazardous waste. Indeed, the results from Questionnaire 2, sent to different stakeholders confirmed that there was not much information related to chemical management in the country and that none of the respondents have received any training related to the Globally Harmonized System of classification of chemicals. The level of awareness of risk management strategies was moderate for the ministries and not much among the private sectors (e.g. chemical importers and distributors) and key associations.

A survey of the courses available in Mauritius related to chemical and chemical waste management revealed that the majority of the courses are offered at the University of Mauritius under the following programmes:

- Diploma in Sanitary Sciences
- Diploma in Health and Safety
- Certificate in Solid Waste Management
- Bachelor in Chemical and Environmental Engineering
- MSc in Environmental Engineering
- MSc Sustainable Environmental Management
- MSc Environmental Science with Specialization in Environmental Management
- MSc in Chemistry with Environment
- MSc Port Management

These programmes include modules that cover important aspects such as environmental management (including risk management), waste management and characterizations and Health and Safety. Most of the learners are also introduced to the various legislations related to proper chemical and chemicals waste management. Some of the programmes are specially design to cater for the needs of the government authorities. The case in point is the Certificate in Solid Waste Management which was designed to train personnel from the district councils and municipalities involved in Solid Waste Management processes while the MSc Port Management was designed for port officers working at the Mauritius Port Authority. The university upon request of the respective ministries as it is often the case, runs the commissioned programmes.

The country experts servicing the modules developed their expertise either through the research conducted in the area, past experience related to the subject or by attending training workshops from international bodies (e.g. UNEP and UNITAR).

However there was no compilation of programmes undertaken on Chemical and Chemical waste management over the years at the University of Mauritius.

Other Courses on Chemical and Chemicals Waste Management

Private training institutions such as the SGS (Société de Gestion et Surveillance) organize, on adhoc basis, short duration trainings (of one to two weeks) to address the need for private organizations.

12. Assessment of country potential trainers

The results of the survey questionnaire 2 also shows that some ministries (e.g. the Ministry of Local Government and the Ministry of Environment and National Development Unit) have the institutional capacities to provide training on waste management and risks associated with improper chemical waste management. Most of the stakeholders showed low level of training capacities and this can be associated with the lack of training obtained by the institutions in this field. Table 42 gives a list of potential trainers in Mauritius.

Table 12.1: List of potential trainers in Mauritius

| Potential Trainer | Subject Area | Experience |
|---|--|-----------------|
| Dr Choong Kwet Yive | Risk assessment and management, Chemical analysis, POPs | Over 10 years |
| Assoc Prof Dr R Mohee Lead Trainer on Hazardous Waste management | Environmental Management Life Cycle Inventory Risk Management | Over 15 years |
| Dr Ramessur | Coastal Zone Management | Over 10 years |
| Dr Daby | Integrated Coastal Zone management | Over 10 years |
| Dr Ghoorah | Dangerous Chemicals Management | Over 5 years |
| Mrs Vimi Dookhun | Chemical Safety and Loss Prevention Risk Management Environmental management Ecotoxicology Health and Safety in Industries | Over five years |
| Ms Rughoonundun | Waste Management Sewage Disposal Methods | Over 5 years |
| Mr P Kowlessar | Waste Management | Over 10 years |

13. Conclusions and recommendations

According to the terms of reference of this assignment, this report should have taken six weeks for completion. However, given that the National Chemical Profile for Mauritius was not done and the amount of work that this assignment required, it was impossible to finish the study within the planned deadline. The time planning of this assignment has been well under estimated even if the National Chemical Profile existed prior to this assignment. For these reasons, the report suffered a few weeks delay and it was not possible to complete Annex 1, which is the National Chemical Profile that would have required at least one more month to complete. However, adequate information has been gathered to complete the study.

13.1 Conclusions

In Mauritius, in general the adequate legislation exists for the management of chemicals throughout their life cycle. These regulations, which need to be improved to include all POPs, fall under three main pieces of legislation:

- DCC Act 2004
- EPA 2002
- Food Act 1998

However, due to lack of resources amongst other reasons, enforcement of these legislations is very often poor.

It is important to note that;

- (i) Mauritius does not export raw chemicals, but imports raw materials including industrial and agricultural chemicals and exports semi finished and finished products.
- (ii) Whilst general waste is adequately management by the Ministry of Local Government, chemical waste and more generally hazardous management is of serious concern for the island. As it has been observed, very little has been done in this area yet. The lack of proper infrastructure to accommodate these categories of waste is highly affecting the enforcement of the relevant legislations.
- (iii) The generators of Hazardous waste lack guidance to handle and manage their hazardous wastes. The whole structure of collection, storage and proper disposal should be re-looked into. National Cleaner Production Centres that will be established under the responsibility of the National Productivity Council soon, can also include in their objectives to give proper training on Cleaner Production Concepts and encourage material substitution.
- (iv) There are already actions taken against the problem of the hazardous waste management: Workshops on hazardous waste management take place and a

hazardous waste management information system is being developed, which should contain a database of hazardous waste generators and their waste streams. At the moment, the reports on hazardous waste generation are limited, therefore the data base does not really work. As a result, the government has no clear idea what is happening concerning the production and treatment of hazardous waste.

- (v) Other projects search for solutions of the hazardous waste. The results are awaited soon and should be operational by 2009.
- (vi) Furthermore, although some efforts have been done to promote recycling, for example recycling of PET bottles, paper, glass or used oil, much more can be done in this direction to considerably reduce the amount of solid waste (about 380,000 tons) that is disposed of at the Mare Chicose Landfill site annually.
- (vii) The surveys revealed that most of the stakeholders lacked capacity in risk analysis and risk management regarding chemicals.
- (viii) The capacity of the country to deal with existing and new global environmental issues is also judged as rather low by all stakeholders. The reason for this shorting coming is probably the lack of resources and the delayed communication between the government and international bodies.
- (ix) The surveys also revealed cooperation and information exchange between various stakeholders is not sufficient and need to be improved.

13.2 Recommendations

The emerging issues of global concern such as the management of chemical and chemical waste should not be overlooked as less important than existing problems. Establishment of proper poison centres can help the public to benefit from proper awareness related to better chemical usage, storage and disposal so that the least impacts are caused to the humans and the environment.

Mandatory risk audits are fixed by law, however due to lacking resources and trained auditors, the law is not enforced. Environmental reporting should be made mandatory and more resources should be allocated to the enforcement of laws and regulations.

Use of existing measures and reorganisation:

Mauritius has many good initiatives. It is important that the country makes appropriate use of them:

- (i) Mauritius has a Multilateral Environmental Agreements Coordinating Committee. The members of this committee are constituted by representatives of main stakeholders (e.g. Ministry of Health, Ministry of local Government,

University of Mauritius, Ministry of Agriculture, etc.) This committee meets regularly and they have already met twice.

- (ii) The NIP, has identified stockpiles of POPs. Currently, a medium size project is being developed jointly by the Ministry of Environment and UNDP, Mauritius for the disposal of these POPs.
- (iii) The mechanism for developing a national profile and priority actions for the country should be reviewed, as there seems to be unclear lines of responsibilities.
- (iv) Restructuring of the existing infrastructures e.g. Police de L'Environment can also help greatly to alleviate the ministries of environment and health from doing enforcement of the legislations and thus devote more time to the priorities management issues like hazardous waste. The government can look into increasing the human capacity and skills development of the Police De L'Environment.

Training and capacity building

- (v) Training is needed, both for government officials and other stakeholders on how to deal with poisoning and chemicals incidences.
- (vi) Lack of information among the different responsible groups can be enhanced through networking and holding of national workshops.
- (vii) The lack of information among the second group of stakeholders (private, NGO, groups at risk, etc.) and especially among groups at risk like chemical dealers should be enhanced by including them in workshops and trainings. Furthermore, the communication between these two groups of stakeholders should be improved;
- (viii) In terms of capacity building, specialized courses can be mounted at the request of the ministries or stakeholders (e.g. chemical dealers) by the University of Mauritius. For more specialized skills e.g. transport of hazardous waste, external expertise can also be sought.
- (ix) International assistance for training of local stakeholders would also be very beneficial in areas where local expertise is limited. Networking is needed in order to enhance cooperation among stakeholders. Data gaps on the generated chemical waste need to be filled;

13.3 Summary of the specific recommendations

For the better management of chemicals and their wastes, general and hazardous wastes, and for the protection of population against toxic effects of chemicals, it is important that the authorities consider the following specific recommendations for Mauritius, which will help in addressing the gaps which have been identified:

- (i) To allocate more resources to ensure proper enforcement of laws and regulations managing chemicals throughout their lifecycles;
- (ii) To review the overlapping of responsibilities and legislations;
- (iii) Until the coming into operation of the interim hazardous facility in 2010: to ensure that hazardous wastes generated are properly handled and stored;
- (iv) To promote cleaner production that will reduce the generation of hazardous waste;
- (v) To promote recycling in order to reduce the volume of waste to be treated at the Mare Chicose landfill site;
- (vi) To establish proper poison centres;
- (vii) The implementation of GHS for labelling of chemicals;
- (viii) To promote cooperation and information exchange amongst the stakeholders involved in management, importation, exportation, transport and use of chemicals locally, regionally and internationally.

Specific areas where projects can be developed

Table 13.1 Possible project areas

| SAICM AREA | Possible Projects |
|--|---|
| RISK REDUCTION | Building of capacities to deal with poisoning and chemical incidences |
| | Occupational Health and Safety |
| | Chemicals of global concern |
| | Highly toxic pesticides-risk management and reduction |
| | Waste management (minimization) |
| | Formulation of prevention and response measures to mitigate environmental and health impacts |
| | The Role of GHS in risk Reduction |
| | |
| KNOWLEDGE AND INFORMATION | Hazardous data generation and availability |
| | Globally Harmonized System (GHS) of Classification and Labelling |
| | Information management and dissemination |
| | Highly toxic pesticides risk management and reduction |
| | Creation of National and International Registers |
| | |
| GOVERNANCE | Stakeholder participation in decision making processes |
| | Assessment of national chemical management to identify gaps and prioritize action |
| | Implementation of integrated national programmes for sound management of chemicals |
| | GHS (review of national legislation and align with GHS requirements) |
| | Social and economic considerations |
| | Legal, Policy and institutional aspects |
| | EIAs to include chemicals and hazardous waste |
| | |
| CAPACITY BUILDING AND TECHNICAL COOPERATION | Capacity-building to support national actions |
| | Formulation of preventive and response measures to mitigate environmental and health impacts of emergencies involving chemicals |
| | Remediation of contaminated sites and poisoned individuals |
| | |
| ILLEGAL AND INTERNATIONAL TRAFFIC | Prevention of illegal traffic in toxic and dangerous goods |

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15 ANNEXES