12 Hazards Substances and Waste Management

Introduction

The Ministry of State for Environmental Affairs has attached great importance to the impact of hazardous substances and waste pollution on the environment in its bid to address the problem of protecting the Egyptian environment and human health against the risks of such substances and waste in all their forms and no matter their sources as well as all stages of production, import, handling, storage, treatment, and final disposal in addition to banning the import, entry or transit of hazardous waste into the territory of the Arab Republic of Egypt. Law no 4/1994 on environmental protection and its Executive Regulation defines means of sound environmental management of hazardous substances and waste and its requirements in conjunction with Basel Convention in 1989 controlling transboundary movement of hazardous waste and its disposal, which Egypt had ratified on this convention in 1993.

The above mentioned Law cites the definition of hazardous substance as material with hazardous properties harmfully affecting human health or adversely impacting on the environment such as infectious, toxic, explosive, inflammable substances or ionized radiations.

Hazardous waste are the remains of different activities and processes or related ashes sustaining hazardous material properties which have no subsequent-original or substitute uses such as clinical waste from therapeutic activities, or from manufactured pharmaceutical or organic solvents, inks, dyes and paints.

In this perspective, and with a view to ascertaining the soundness of handling hazardous substances and waste, Chapter 2 of Section I of Law no. 4/1994 on the protection of the environment and Chapter 2 of

Section I of its Executive Regulation stated provisions governing hazardous substances and waste handling and management.

Article 25 of the Regulation identifies agencies concerned with citing lists of hazardous substances and wastes and authorized to grant licenses for their handling to ensure their sound and safe management.

Sources of Generated Hazardous Waste

1- Industrial Activities:

Considered as one of the main sources of hazardous waste quantitatively and qualitatively, mostly generated from the following industries:

a. Chemical and petrochemical industries
b. Spinning and weaving, dying and preparation and equipping processes
c. Pesticides and fertilizers
d. Steel, metal painting, melting and foundry
e. Detergents, leather tanning, paper, and pharmaceuticals
f. Asbestos industry and electronics

2- Agricultural Activities

Pesticides and fertilizers with expired periods or ceased validity for use and their empty containers are deemed among major agricultural hazardous wastes.

3– Petroleum Activities

By-products of oil extraction and refining as well as its transportation and use.

4– Health Care Waste

Waste from hospitals, treatment units, private clinics as well as household waste on mixing it with these types of waste. Health care waste can be categorized as follows:

a. Infectious Waste: This type of waste is contaminated with the patient's body fluids or secretions, with cutting (sharp) and piercing tools such as syringes and scalpels being the most hazardous.

b. Pathological Waste (Tissues): Such as amputated parts of the human body and human organs resulting from operation theater as well as delivery (placenta) wastes which are likely to be carrying infection hazards.

c. Chemical Waste: Such as waste from disinfectants and lab chemicals plus drug remains or medicines with expired dates and other chemicals used in health facilities. The most hazardous of the above mentioned wastes are drugs used for tumor therapy.

d. Radioactive Waste: Waste from radioactive isotopes used in treatment and diagnosis.

e. Explosive Waste: Such as empty packs of aerosols or those containing waste from some lab chemicals.

5- Research and Lab Activities

Hazardous wastes from research and lab activities requiring special ways of their handling and safe disposal.

6- Service Activities

a. Sludge resulting from mixing industrial effluent with sanitary drainage
b. Car-service stations, photo laboratories, printing houses and different dry-cleaning shops
c. Car tires and used batteries

7- Military Operations

Waste normally results from military operations in massive quantities, most importantly land and sea mines and expired ammunition.

8- Garbage

Household garbage and that resulting from institutional and commercial activities involve some hazardous waste such as expired medicines, chemicals, paints, domestic insecticides and their empty containers, consumed dry batteries and electronics.

Current Status of the Health Care Sector

1. The health care sector in Egypt is composed of 4 main groups namely:
   a. Establishments affiliated to the Ministry of Health and Population with 79058 beds accounting for 47.9%.
   b. Establishments supervised by the Ministry of Health and Population with 39052 beds representing 23.6%
   c. Hospitals affiliated to other ministries accommodating 27028 beds representing 16.4%
   d. Special hospitals and medical centers with 20000 beds representing 12.1%
2. The total number of health care establishments in Egypt is around 165138 units

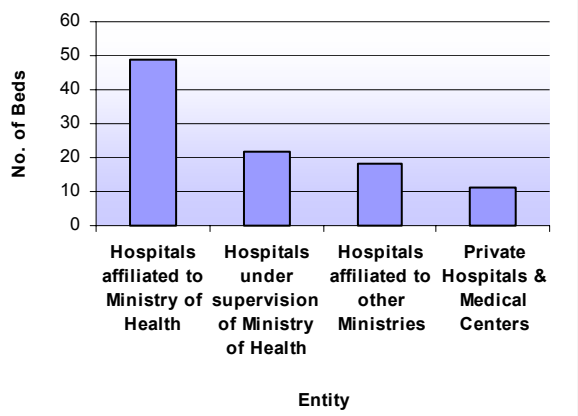

Figure (12-1) Distribution of Beds in Health Care Establishments

3. The total gross waste of the health care sector in Egypt is estimated at approximately 390901 kg/day distributed as follows:
   a. All types of hospitals producing 330276 kg/day inclusive of hazardous waste estimated at around 82569 kg/day.
   b. Health care units affiliated to the Ministry of Health producing 17365 kg/day inclusive of hazardous waste estimated at around 5210 kg/day.
   c. Medical centers, clinics, and private laboratories producing 23260 kg/day inclusive of hazardous waste estimated at approximately 11735 kg/day
   d. Veterinary health care units producing 20000 kg/day inclusive of hazardous waste estimated at around 10000 kg/day.
4. Most hospitals carry out regular waste-collecting processes while splitting these wastes into infectious hazardous waste collected in red bags and municipal waste in black bags.
5. Some hospitals treat hazardous waste by incineration (102 incinerators) or by sterilization for disinfection (sterilizers numbered 31).
6. Treatment is conducted either inside the hospital (special unit at the hospital) or outside the hospital by the nearest treatment unit.
7. Environmental and health problems related to health care waste:
   a. Open burning of health care waste from hospitals, health centers and units thus causing air pollution.
   b. Disposal of such waste in landfills thus leading to soil and surface and ground water pollution.

c. Harmful emissions and smoke from old incinerators which fail to meet sound environmental conditions and controls.

d. Increased infection among members of the medical team and staff in charge of managing municipal waste since no good insulation system for infectious waste is applicable.

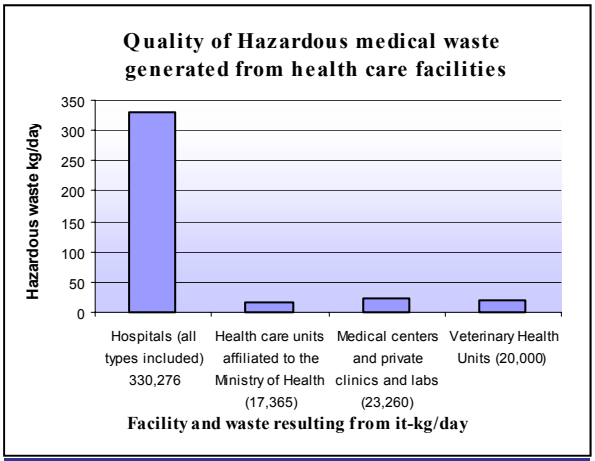

Figure (12-2) Quantity of Hazardous medical waste resulting from activities of health care facilities

Navigation Movement Across the Suez Canal of Vessels Carrying Hazardous Waste

Navigation across the Suez Canal is permitted for ships carrying hazardous waste for the purpose of their recycling, reuse or final disposal in accordance with the Basel Convention on controlling transboundary movement of hazardous waste and their final disposal and other relevant international instruments and in compliance with bilateral or multilateral agreements concluded between exporting and importing countries.

In coordination with the Suez Canal Authority, national terms alongside conditions stated in international conventions relating to navigation movement of vessels transporting hazardous waste had been laid down citing:

1. Commitment to any and all requirements articulated in the Basel Convention regarding the passage and transit of vessels carrying across border hazardous waste.
2. Abidance by all statutes relevant to the movement of the ships of the Suez Canal Authority.
3. Obtaining the approval of the Suez Canal Authority.
4. Prior dispatch of the movement document to the Environmental Affairs Agency and the Suez Canal Authority citing the name of the ship and the shipping date in the exporting country.
5. Naming the shipping agency, its relevant data and the (P & I) Certificate.
6. Vessels carrying hazardous waste containers shall not allowed to transit in Egyptian ports and must move on immediately after their passage.
7. Vessels carrying hazardous waste shall be prohibited to carry out shipping and unloading operations during its passage in regional waters and the purely-Egyptian economic region.
8. The two following figures (12-3, 12-4) indicate the number of hazardous waste shipments across the Suez Canal of exporting to importing countries.

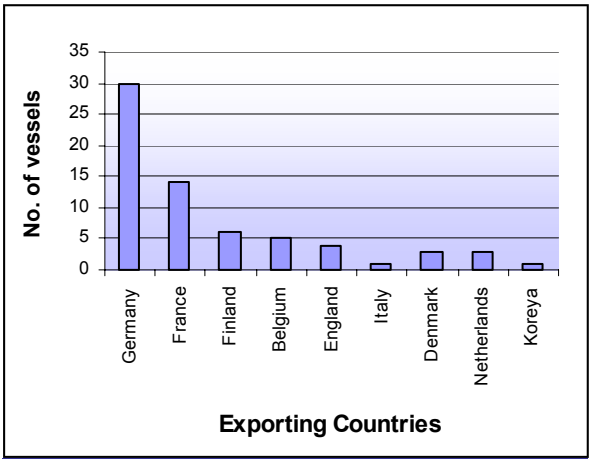

Figure (12-3) Number of Exporting Country Vessels Carrying Hazardous Waste Across the Suez Canal During 2005

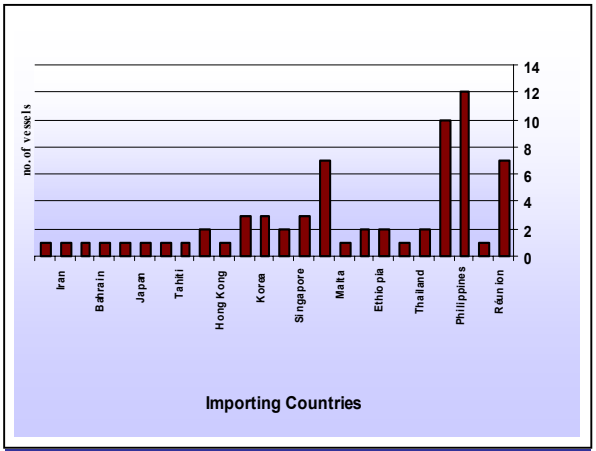

Figure (12-4) Number of Vessels carrying hazardous waste across the Suez Canal and heading for countries importing these wastes during 2005

State Efforts Regarding Hazardous Substance Management in Egypt

1. As part of efforts made in the area of hazardous substance management, a comprehensive survey of the lead sources in the industrial region in Shobra El Kheima, an assessment of environmental and health risks and a listing of chemicals used in different industries had been conducted within the framework of the Industrial Pollution Control Program included in the 2005-2006 Plan of the Environmental Affairs Agency.

Table (12-1) Lists of Hazardous Substances Issued by the Ministries Concerned

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Ministry	List (A)	List (B)	Remarks
Health	7	52	In addition to list (B): -- All kinds of detergents and disinfectants in high concentrations. -- Insecticides used in the area of sanitation. --Pharmaceutical products
Electricity and Energy	--	184	A special paragraph on natural raw materials is attached to the list.
Industry	--	145	
Petroleum	--	48	
Interior	--	75	
Agriculture	172	-	

2. The six ministries concerned had been following on the handling of hazardous substances and waste referred to in the Environment Law no 4/1994 and its Executive Regulation to issue or update ministerial decrees on lists of hazardous substances and waste resulting from the activities of the given ministries namely: Industry, Health, Interior, Agriculture, Petroleum and Electricity. Annex (12-1) shows the hazardous waste lists issued by the 4 Ministries of (Industry-Health-Interior-Agriculture).
3. Participating- jointly with the Egyptian General Organization for Standards and Quality Control in the issuing of the first Egyptian standard specification re-

garding incinerators of hazard waste from health and veterinary facilities.

Picture (12-1) Incinerator of Hazardous Waste Generated from Activities of Health Facilities (Local Production – Military Factory 45)

4. Implementation of the program planned to provide governorates with incinerators for hazardous medical waste and surveying the requirements of each governorate in this respect. Based on this program, the manufacture of 15 incinerators by the Military Factory 45 had been contracted which were distributed to different governorates during 2005 upon the review of technical specifications and ascertaining conformity with applicable standards in order to effectuate the system of hazardous medical waste sound management and safe disposal.
5. The listing and safe storage of 1160 tons of expired accumulated insecticides at the Ministries (of Agriculture, Irrigation and Health) had been finalized. In coordination with the Egyptian Customs Information Center, the listing of expired accumulated chemicals and insecticides kept unattended in Egyptian ports' warehouses in amounts ranging from 5000-7000 tons also had been finally listed to draw up the optimal means of their final disposal.
6. With the participation of the International Working Group formed under the Basel Convention, the technical roadmap of the environmentally safe management of persistent organic pollutants as waste, had been issued.
7. Some projects in the area of integrated hazardous waste management had been implemented including:
   a. The Integrated Hazardous Waste Management Project had been implemented in the Alexandria Governorate in cooperation with the Finnish Government. The second stage of the Project had been completed as an example to be followed in developing the industrial hazardous waste management system in Egypt. The project had so far enumerated the industrial facilities producing hazardous waste in Alexandria, selected a dumpsite for the industrial inorganic solid hazardous waste and established a treatment unit (physio-chemical) of industrial inorganic liquid waste.
   b. The Lead-Polluted Site Remediation Project had been implemented in Shobra El Khema through which (10) heavy metal-polluted sites (lead-cadmium-antinomy) had been subjected to remediation processes and remediation waste had been disposed of as hazardous waste in hazardous waste secure landfill (Al Nasseraya Dumpsite) in the Alexandria Governorate.

Regional and International Role In The Area Of Hazardous Waste Management

1. Finalizing the conclusion of the Framework Agreement between the Basel Convention Secretariat and the Govern-

ment of the Arab Republic of Egypt with regard to the Convention-established Regional Center for Training and Technology Transfer To Arab Countries so as to confer on it the legal character required to enable it to assume its regional role within the context of the Basel Convention Strategic Plan 2002-2010.

2. Taking part in preparing the Center's Action Plan and negotiating with donor countries via the Basel Convention Secretariat to provide necessary funds for the implementation of this Plan. The Finnish Aid Agency had approved of financing the first three years of the operational plan 2006-2008 with an amount worth one million euros. The Plan focuses on activities of supporting human capacities in Arab countries in the priority areas of secure environmental management of hazardous waste as stated in the Convention's Strategic Plan, i.e. returned oils, medical waste, waste from electronics, acidic batteries and vessel fragments in addition to waste resulting from activities of supporting legal and legislative frameworks to foster compliance with provisions of the Convention and promote the endorsement by Arab states of Decree no 1/3 banning export of hazardous waste to developing countries and promoting ratification of the Liability and Compensation Protocol concerning harms caused by transboundary movement of hazardous waste.
3. Finalizing the empirical regional project designed to secure landfill, designing and operating safe dumpsites for hazardous waste that was implemented by the Basel Arab States Regional Center where a host of guidelines had been prepared to design, build, operate and control safe hazardous waste landfills especially in dry and extremely dry regions.
4. In coordination with the Basel Convention Secretariat, a training program had been launched for Basel Convention National Liaison Offices at the level of Arab States as regards liability and compensation for accidents resulting from the cross-border transport of hazardous waste in which interested international organizations and insurance companies participated.

Moreover a training program for ports' officers and customs points officials at the level of Arab states who are responsible for controlling and applying procedures of uncovering illicit trafficking in hazardous waste had been organized with the participation of relevant international organizations and the Interpol.

Future Plan 2007-2012

Establishing an integrated hazardous substance and waste management system over a 5-year period covering all stages starting with the generation and then collection of such waste from their sources, followed by their storage and handling and later their transport to treatment, recycling and recovery units and ending up with the final disposal stage in a gradual-phased and prioritized manner.

This demands formulating all sides of the system technically, legislatively, institutionally, and financially as well as developing human resources. This system includes the following sub-objects:

1. Prevention or reduction at-source of generated hazardous waste possibly to the minimum by employing the cleaner production technology.
2. Foster recycling, reuse and treatment of

hazardous waste prior to their final disposal.

3. Encourage participation of the private and non-governmental sector in the resolution of the problem.
4. Consolidate international cooperation towards the implementation of international instruments governing the hazard waste movement and contribution to their relevant activities.
5. Engagement of hazard waste producers in the defrayal of expenses related to the safe handling of this type of waste.
6. Prevention of illicit trafficking in hazardous waste.
7. Support and encourage local manufacture of equipment and inputs required for integrated hazardous waste management (collection, transport, storage, treatment, and disposal).
8. Coordination with training as well as research and educational centers at all levels in universities, institutes and others to settle problems derailing the process of handling such wastes.
9. Elimination of pollution and remediation of degraded sites as a result of hazard waste accumulations.
10. Raising awareness and upgrading cognizance at all levels.
11. Installing hazard waste database and information system.

References

1) Law no. 4/1994 for Environmental Protection and its Executive Regulation (amended).
2) Basel Convention on Controlling Transboundary Movement of Hazardous Waste and their Disposal.
3) Platform of the President of the Republic (Investment Projects).
4) Environmental Action Plan 2002-2017 .