SOLID WASTE MANAGEMENT SYSTEM UNDER SPECIAL & LOCAL LAWS OF PAKISTAN

Submitted By

Fayyaz Ahmad Ranjha
LL.M. (International Law)

Supervisor

Mr. Jawad Hassan
Advocate Supreme Court of Pakistan

Reg. No. 24 FSL/ LLMIL/F04

Faculty of Shariah and Law
INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD

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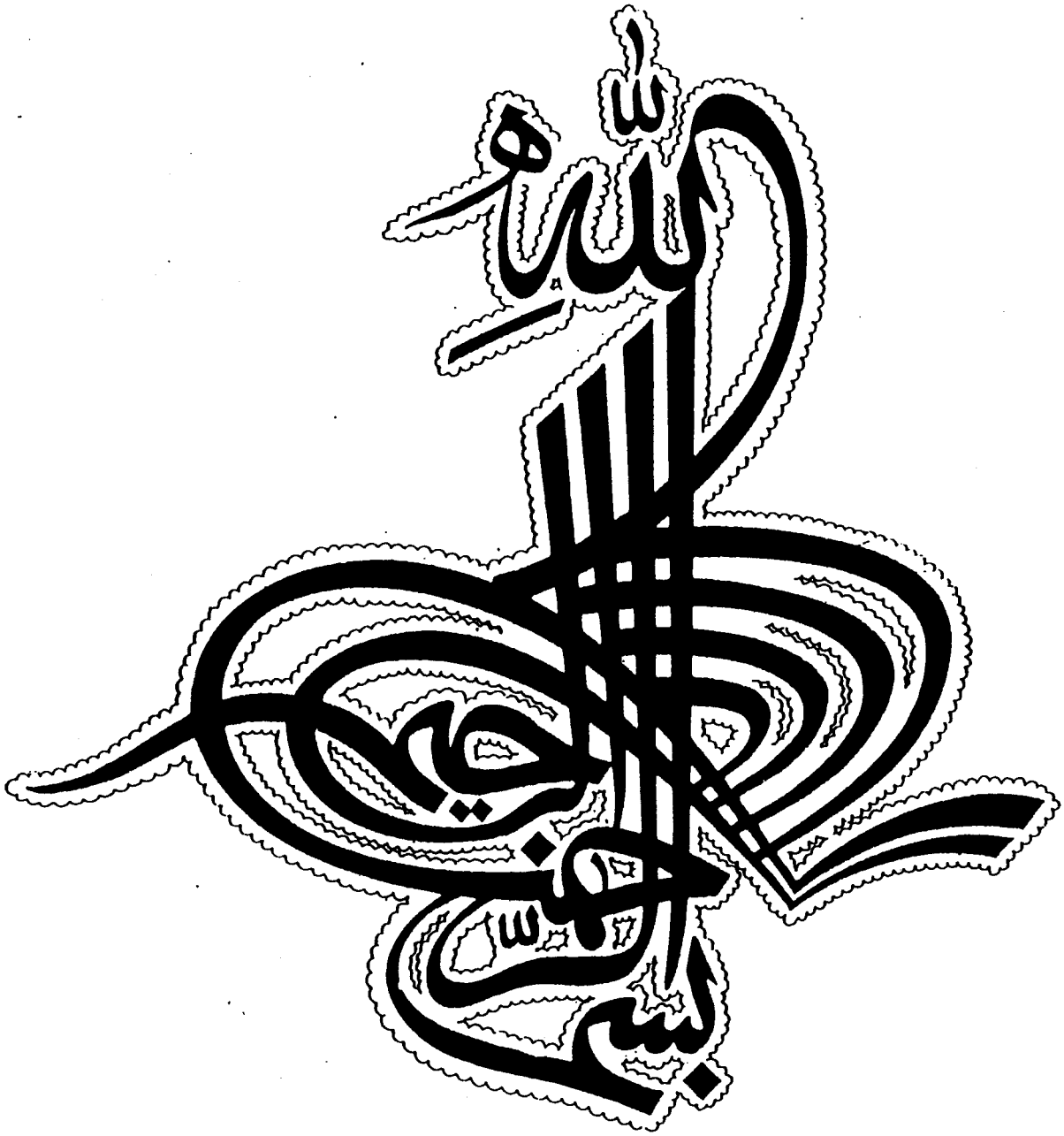
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It is certified that we have gone through the thesis submitted by **Mr. Fyyaz Ahmad Ranjha** and we have come to the conclusion that the research work is up to the mark and fulfils all the requirements for the grant of the Masters degree in Law by the faculty of Shariah and Law, International Islamic University, Islamabad.

VIVA-VOCE EXAMINATION COMMITTEE

EXTERNAL EXAMINER

Mr. Tariq Bilal
LL.M. (Georgetown, USA)
Advocate Supreme Court of Pakistan.
Finance Secretary,
Supreme Court Bar Association,
Of Pakistan, Islamabad.

INTERNAL EXAMINER

Mr. Muhammad Munir
Assistant Professor,
Faculty of Shariah and Law

SUPERVISOR

Mr. Jawad Hassan
LL.M, (Pace, USA)
Advocate Supreme Court
Of Pakistan.
Visiting Professor,
University Law College,
Punjab University, Lahore.

TO

MY PARENTS AND WIFE

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ABSTRACT

Clean and healthy environment a basic right of man, is universally accepted. But right is violated by man himself. As nearly everyone causes environmental pollution in some way. People dirty the air with gases and smokes poison the water with chemical and other allied substances, and damage the soil with so many fertilizers and pesticides. Surrounding is also polluted by the people in variety of ways i.e. that ruin natural beauty by scattering Junk a litter on the land and the water. The operation of different machines and motor vehicles fill the air with different noise. Among the pollutants that hurt water bodies and land is the solid refuse from industrial concerns, commercial centers and house hold activities. Solid waste management is considered one of the major issues that need to be addressed properly to arrest the environmental degradation. The hazards that emanate the complexity of the problem are curiously hutting man and environment. The disposal of urban, municipal and industrial waste is a challenge for the regulators of local councils and industries in many countries throughout the world. Production of waste will continue to increase in future. The current world population growth is parallel to the global increase in the waste production is placing stress on both demand for agricultural production and finite world resources. Since the late 1970s the management of urban and industrial waste has attained much attention, owing to the recognition of implication of Potentially Toxic Substances (PTS).

In this study an attempt has been made to evaluate the existing solid waste management system in Pakistan with a detailed history of solid waste management in

different developed and developing countries. At the same time a comparative analysis of the developed and developing countries solid waste management has been made by by bedecking the thesis with the classical examples of a chosen few cities of the developed and the developing countries. Moreover, case laws have been quoted to strengthen the proposed solutions. This is in depth study of the problem which encompasses the legal intricacies and their development over the decades. This study, moreover takes into its compass the different methods that have been practised by a variety of communities across the globe for the solid waste management. The scheme plan focuses the introduction, of forms of pollution, historical study of solid waste management its management, technique, legislation and regulations pertaining to solid waste methods for management and its findings with proposed solutions.

ABBREVATIONS

CDA	**Capital Development Authority**
CDGK	**City District Government Karachi**
CDGL	**City District Government Lahore**
Cr PC	**Criminal Procedure Code**
EPA	**Environmental Protection Agency**
EPA	**Environmental Protection Authority**
ESM	**Environmentaly Sound Management**
EU	**European Union**
FRHW	**Federal Rules for Hospital Waste**
HK	**Hong Kong**
MSW	**Municipal Solid Waste**
NEQS	**National Environment Quality Standards**
NGOs	**Non-Governmental Organizations**
NWFP	**North West Frontier Province**
PEPA	**Pakistan Environmental Protection Act**
PEPO	**Pakistan Environmental Protection Ordinance**
PLGO	**Punjab Local Government Ordinance**
PPC	**Pakistan Penal Code**
PTA	**Pakistan Tanneries Association**
SWM	**Solid Waste Management**
TMAs	**Tehsil Municipal Administrations**
UK	**United Kingdom**
UNDP	**United Nation Development Population**
USA	**United States of America**

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Chapter # 1

INTRODUCTION

Environment:

According to Pakistan Environmental Protection Act, **Environment** includes;

(a) air, water and land,

(b) all layers of the atmosphere,

(c) all organic and inorganic matter and living organisms;

(d) the ecosystem and ecological relationships;

(e) building, structures, roads, facilities and works;

(f) all social and economic conditions affecting community life; and

(g) the inter-relationships between any of the factors specified in sub-clauses (a) to (f).[1]

(a) Natural Environment:

Ecologically, the environment is the sum of all external conditions and influences affecting the life and development of organism. Various ecological principles and

[1] Federal Government of Pakistan (Ministry of Law), "environmental protection Act, 1997". Pakistan Printing Press Corporation 1997, section 2.

concepts have been developed in regard to the environment. This is the whole system of interaction between particular organism and its physical and biotic environment is the niche of that organism.[2]

(b) Man Made Environment:

The man made environment includes all the buildings and materials that has been erected and fashioned by man.

Pollution:

Means the contamination of air, land or water by the discharge or emission of effluent or wastes or air pollutants or noise or other matter which either directly or indirectly or in combination with other discharges or substances alters unfavorably the chemical, physical, biological, radiational, thermal or radiological or aesthetic properties of air land or water or which may, or is likely to make air or land or water unclean, noxious or impair or injuries, disagreeable or detrimental to the health, safety, welfare or property of person or harmful to biodiversity.[3]

Different Kinds of Pollution:

Following are the three main kinds of pollution;

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[2] McGraw Hill, "McGraw Hill Encyclopedia of Environmental Sciences" Book Company, San Fracisco, . 1977, Page 266

[3] Ibid section 2

Air Pollution Water Pollution Land Pollution

i) Air Pollution:

Air Pollution is the accumulation in the atmosphere of the substances that, in sufficient concentration, endanger human health or produce other measured effects of living matter and other materials. Air pollution turns clear odorless air into hazy, that harms health, kills plants, and damages property. Amongst the major sources of air pollution are power and heat generation, the burning of solid wastes, industrial process and especially transportation. The six major types of pollutants are *carbon monoxide, hydrocarbons, nitrogen oxides, particulates of sulfur dioxides and photochemical oxidants.*

Examples of Air Pollution:

Toxic Fumes

People cause air pollution by pouring millions of tons of gasses and particulates in the air. The Toxic gases that are produced through different chemical processes fill the air. One of the most common forms of air pollution is smog.

Combustion:

Most air pollution results from combustion. The burning of gasoline to power motor vehicles and burning of the coal to heat buildings, to generate electricity and to

manufacture different products results pollution. Each time the fuel is burned in combustion process, pollutants are released into the air. This air pollution ranges from small in amounts of colourless poison gases to clouds of thick hazy black smoke.

The uncovered heaps of dirt

In third world countries no measures have been taken to protect the solid waste properly. The waste is accumulated at the street ends and in most cases left uncovered. The result is different chemicals actions that breed the foul fumes that pollute the environment and some times become the cause of different epidemics.

There is a phenomenon in nature to reduce the pollution in the air. Wind scatters pollutants and rain and snow wash them into the ground. But, this is true at the some time that pollutants are put into the air faster than weather conditions dispose of them. In metropolitan area thousands of automobiles factories and furnaces add tons of pollutants to a small area of atmosphere each day.

Water Pollution:

The pollutants that affect the water bodies come mainly from industries farms, and the sewerage systems. Different industrial concerns dump huge quantities of waste products into bodies of water each year. These wastes include chemicals wastes from animal and plant matter and hundreds other substances. **Wastes from farms.** This waste include animal refuses fertilizers and pesticides. Most of these material drain off from

farm fields and into nearby bodies of water. **Wastes from home and offices.** Sewerage systems carry wastes from homes, offices and industries into water.

There are however waste treatment plants that remove some of the most harmful wastes from sewerage that even after treatment contain material that harms water.

Land Pollution:

Ruthless, use of fertilizers and pesticides is seriously harming the thin layer of fertile land that is essential for growing crops. Solid wastes are probably the most visible form of pollution. People throw away millions of tons of solid material each day. Much of this waste ends up littering road sides floating in lakes and streams and collecting in ugly dumps. The solid waste include Junked automobiles tyres, refrigerators, stoves, cans, bottles, packing materials and scraps of metal and paper.

Other Kinds of Pollution:

There are other pollutants that cannot be classified into as air, water, or soil pollutants. These pollutants include noise, radiation acid rain, pesticides and metals as mercury and lead.

Noise Pollution:

This is a big nuisance in big cities. People in and near cities are exposed to loud noise much of the time. This noise emanates from construction projects, industries, air

planes automobiles, buses, motorcycles, trains and trucks. This noise brings many discomforts to human beings and in extreme cases impair hearing and causes deafness.

Radiation:

This is an invisible pollutant that can be highly dangerous and does havoc to the living beings. Some forms of radiation no doubt does come from the sun and outer space, however, the radiation that does come from radio-active materials, such as fall out from nuclear weapons testing and waste material from nuclear plants in highly dangerous, various electronic devices like television sets, computers and micro wave ovens produce radioactivity scientists have not determined exactly what affects small amounts of radiation have on humans. But exposure to large amounts of radiation is believed to result in cancer and in harmful changes in reproductive calls.

Definition of Waste:

Waste means any substance or object which has been, is being or is intended to be, discarded or disposed of, and includes liquid waste, solid waste, waste gases, suspended waste, industrial waste, agricultural waste, nuclear waste, municipal waste, hospital waste, used polyethylene bags and residues from the incineration of all types of wastes[4]

[4] Pakistan environmental protection Act, 1997, Article 2 (xiv).

Hazardous waste

Hazardous waste means waste which is or which contains a hazardous substance or which may be prescribed as hazardous waste and includes hospital and nuclear waste[5]

Hospital waste:

Hospital waste includes waste medical supplies and materials of all kinds, and waste blood, tissue, organs and other parts of human and animal bodies, from hospitals, clinics and laboratories[6].

Industrial waste:

Industrial waste means waste resulting from industrial activities[7].

Municipal waste:

Municipal waste includes sewage, refuse, garbage, waste from abattoirs, sludge and human excreta and the like.

Nuclear waste:

Nuclear waste means waste from any nuclear reactor or nuclear plant or other nuclear energy system, weather or not such waste is radioactive [8].

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[5] Ibid, Article 2 (xix)
[6] Ibid, Article 2 (xx)
[7] Ibid Article 2

Agricultural waste:

Agricultural waste means water form farm and agricultural activities including poultry, cattle farming, animal husbandry residues from the use of fertilizers, pesticides and other form chemical[9].

Organic waste:

Organic waste the organic component of these wastes consists mainly of materials such as food waste, paper, cardboard, textile, plastics, rubber, leather and yard wastes.

Inorganic waste:

Inorganic waste components consists of items such as glass, bottles, tin cans, aluminum, other metal, batteries, oil and paints[10].

The definitions given above very comprehensively look into the meaning of word waste and comprehensively cover all the forms of waste that is produced by different human activities with a wide range from hospital to industry and from nuclear to the agriculture waste.

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[8] Ibid, Article 2 (xxxi)
[9] Ibid Article 2 (ii)
[10] Iqbal H. Khan & Naveed Ahsan, "Text Book of solid waste management" publishers 11-Darya Gunj New Delhi, page 65.

HISTORY OF SOLID WASTE MANAGEMENT

Men have always polluted environment. But in the era of primitive civilization solid waster had not posed a serious problem, as the population was sparse and land was available to dispose waste materials. However, the technological advancement, rapid growth of population and speedy industrialization has made the pollution a real bastard. This problem is being given due importance in the industrialized countries both in public and private sectors, but the developing countries have not approached to the problem on the basis of engineering principles. A historical analysis will acquaint us the a situation of solid waste and its disposal indifferent periods of history.

Indian subcontinent is a region that has the most ancient civilization. The traces of human history are still preserved in the Indus valley. The ruined cities of Mahenjo Daro in Sindh Pakistan and Harappa near Sahiwal Punjab (Pakistan) speak the grandeur of ancient India. The houses were straight in line and had their established waste disposal system. The traces of public toilets and drains are found in the ruins of these cities. The Sultnate India and the Mughal India had a full-fledged department to serve the people to keep their environment clean.

The **china** of 200 B.C had its sanitary police whose job was to enforce the disposal laws.

The **Athens** of 500 B.C passed laws to dispose the waste materials miles away from the walls of the city state. Though this was necessitated by defence reasons yet it served the public at large. The people of the city used to throw garbage over the walls and built piles of garbage that in turn facilitate the invaders to scale over the defence walls. The similar problem was faced by the Roman Empire in 14th A.D. The Romans eventually developed laws for the disposal of waste material.

From 1380 to 1400 Europe faced Black Death sporadically. This spread death and reduced European population almost 40%. This was the result of filth that bred germs of plague.

In 18th Century in Europe hogs were allowed to wander city streets freely rooting through garbage and leaving their excrement and stench behind.

In **US,** in the beginning of colonial days, hogs were the consumers of solid waste. In post colonial days as the cities swelled with new industry and workers, the waste disposal problem become acute. For example the population of Chicago soared from only 5 thousand to 1 million. In New York city in the late 19th century, refuse accumulated in such large heaps along some streets that it impeded pedestrian and vehicular traffic.

In the 19th century England the sanitary conditions were so bad that an urban sanitary act was passed in 1888 prohibiting the throwing of the wastes into ditches, rivers and water.

By the same taken in 1899 the USA promulgated "Rivers and Harbours Act" to regulate the dumping of debris in navigable water and Adjacent lands.

In 1880 garbage reduction was introduced and in 1920 garbage grinding was introduced.

In 1930 the United Kingdom introduced the concept of controlled tipping that is now known as sanitary land filling.

In the late 1960s concern over mankind's ecological problems developed among the industrialized countries as never before. In 1968 UNESCO initiated a long range programme of research, education, and action called "Man and Bio-sphere" and the U.N. General Assembly scheduled a conference on Human Environment for 1972.[11]

On January 28, 2008 The World's biggest polluters US, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, South Africa, south Korea and the United Kingdom met at Hawaii.

This is the second time this group has convened — the first time was in Washington in September — and there has been some skepticism among environmentalists about the effectiveness of this process.

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[11] Coliever, "Coliever's Encyclopedia" Publisher Macmillan Educational Corporation, New York page 261

"The question back in September was, 'Does the fact that they're launching this process indicate some change in the position of this administration?" said Angela Anderson of the non-partisan Pew Environment Group.

The answer, Anderson said, is no: "There has been no change in position whatsoever in this White House. They were hoping to sell their position to the rest of the world and that's no working."

President George Bush drew criticism at the September meeting for his opposition to the mandatory limits on carbon emissions specified by the Kyoto agreement and supported by every other major industrialized.[12]

The Great Sanitary Awakening in the 1840s was spearheaded by a lawyer, Edwin Chadwick (1800-1890), who argued that there was a connection between disease and filth. The germ theory was not, however, widely accepted until the famous incident with the pump handle on Board Street in London. The public health physician, John Snow (1813-1858), suspected that the water supply from the Board Street pump was contaminated and was the cause of the cholera epidemic. He removed the handle and prevented people from drinking the contaminated water, thus stopping a cholera epidemic and ushering in the public health revelation.

[12] Dawn, 28th, January 2008

Practices of disposal solid waste in earlier days

The most commonly recognized method for the final disposal of solid waste at the turn of the century were:

a) Dumping on the land.

b) Dumping in water

c) Plowing in the soil

d) Feeding to hogs

e) Reduction

f) Incineration

a) Dumping on land: -

It was a simple task to haul solid waste to the edge of town and dump them into open dumps.

Open Dumps also attracted flies and rats that spread diseases. This haphazard disposal became a matter of great concern to public health

b) Dumping in Water: -

Although this method was used in some costal cities it was not favored because the pollution consequences were well recognized. The

disfigurement of Coney Island beach in New York city became a case in point never the less the practice continued until 1933 when it was finally prohibited by the US Supreme Court.

c) **Plowing into Soil: -**

This plowing into soil was a method of disposal used for food waste and street sweeping. Because of the large land requirements and the fact that the food waste had to be separated from other waste, this method was not used extensively but interest in it has been rekindled in the 1970s.

d) **Feeding to Hogs: -**

Food waste frequently were fed to hogs on forms closed to urban areas. Unfortunately because of this practice trichinosis became wide spread when contaminated pork crap were fed to hogs in recycled food waste which re-infected other hogs and people who consumed their meat. Sixteen (16) % of US population was infected by eating uncooked pork from hogs fed on food waste in the first phase of 20^{th} century.

e) **Reduction: -**

Food waste reduction, a method no longer used was a rendering process by which the raw waste were treated to separate them into solid and liquid

portions and to recover the grease contained in one hour both portions. The solid portion was known as the "Tankage". Several make pomades and the cheaper grades of perfumery as well as wagon grease.

f) Incineration: -

It is the complete combustion of the wastes at high temperature there by reducing their volume and weight. Incineration was considered to be a final disposal method at the turn of this century, it is now considered to be either volume reduction or an energy conversion process. Because little has changed in the application of this process[13].

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[13] George Tehobanoglous, Hilasy Thesisa, Rolf Filassen, "Solid wastes engineering; principles and management issues" Published Mcgraw hill book company, p. 4

Chapter # 2

MANAGEMENT OF SOLID WASTES

METHODS OF DISPOSAL

Waste Reduction

There are several elements of an integrated waste management system. However special emphasis has always been given on the elements such as waste reduction and material recovery. In the developed countries in contrary to the developing countries, subsidization of the full range of initiatives for waste reduction by governments and the private industry is becoming a norm. Most cities in Western Europe, North America, Australia, New Zealand, Japan, and some in Korea have adopted municipally sponsored source separation and collection systems. In some cases, the separation of post-consumer materials by waste generators has been made mandatory.

The main motivation is to reduce materials that could be landfilled. Typical components of municipal systems for source separation and materials recovery are source of separation of different categories of waste, collection at the curbside or drop off by generators at bins or centers subsidized by the government or private industries, collection of organics (kitchen and garden wastes) for large-scale composting, promotion of backyard composting through education and sometimes the provision of a small compost bin and public subsidization of extensive and varied educational campaigns to

sustain the participation in all aspects of waste reduction. Citizens tend to be highly aware of the problems and cooperate in separation programs.[1]

Source reduction programs (for example in North America) have been implemented through education, research, financial incentives and disincentives (e.g., volume-based fees), regulation, and technological developments. Typical materials recycled in North America include: paper (e.g., cardboard, office paper, and newsprint), bottles and cans (e.g., aluminum, steel, glass, and plastic), ferrous scrap, batteries, tires, used oil appliances, and construction and demolition debris.[2] The major cities have large recovery companies, which collect recyclables from offices, institutions, and factories. There are also neighborhood redemption centers. State policies govern the trading of materials and prices. Since the new economic policy, government has preferred to deal mainly in profitable materials, such as metals, and not in most household recyclables. Other materials are now collected and traded by private entrepreneurs who may either sell to the government companies or directly to factories. The neighborhood redemption centers have declined and as a result, more recyclables are put out as waste by residents. There are new attempts to deal with household recyclables, such as the source separation being organized in residential complexes in Shanghai.[3]

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[1] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/SP/SP2/SP2_2.asp date 20.6.2006
[2] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/North/Topic_a.asp date 27.6.2006
[3] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Asia/Topic_a.asp date 27.6.2006

For certain recyclable materials, developed countries use special containers. These include blue boxes for recyclables in Canada and the USA, and 120-liter rolling carts in much of Europe. In industrialized countries, this is usually a paper or plastic craft paper bags in a metal or wooden frame. In cases where the collected materials have intrinsic value, the collector often pays the generator for the materials, either in cash or by barter, as was the case in Japan, where the paper collector would give out new rolls of toilet paper in return for waste paper.[4]

Collection

While collection is structurally similar in developing and developed countries, there are important technical and institutional differences in implementation. In developed countries, collection tends to be more anonymous, professionalized, and institutionalized, although at the margins, especially in terms of materials recovery, there is plenty of waste picking and salvage work. There tends to be universal service, at least officially, and rarely are sections of a city completely unserved. Most collection is performed by public employees or firms under contract to the government or to business and industrial waste producers. For efficiency reasons, collection tends to occur early in the morning, using closed compactor trucks. Recovery systems tend to be separate from waste collection systems, and to involve different sets of actors.[5] In preparation for collections, MSW is typically stored in either metal or plastic trash cans, plastic or paper

[4] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/SP/SP3/SP3_1.asp date 29.6.2006
[5] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/SP/SP3/SP3_1.asp 7.7.2006

bags, or special containers designed for mechanized collection. Residential waste in North America is collected in at least four ways; (a) at the curbside or alley; (b) from on the property (e.g., the backyard); (c) from a drop-off or mail box collection point; or (d) it is directly hauled by residents to the disposal site. The most common method is curbside or alley collection, where the residents place full waste containers at the curb or in the alley and retrieves them emptied. Backyard collection is less common. Collection usually occurs at least once per week and even more frequently in urban areas where storage space is limited. Drop-off and mailbox collection centers are used in areas (e.g., rural) where individual collection is impractical and in communities where cost savings are more important than the service provision. Drop-off sites typically house dumpsters or even larger roll-off containers, which may be equipped with a compactor. Special pick-up dates are usually established for bulky items such as old appliances, furniture, and tree stumps. Commercial and institutional waste is usually collected from a dumpster located at the establishment. These generators often hire a collection company to handle their waste, but some local governments take on this responsibility. A number of truck types are currently used including rear sides, and front loaders, roll-off and tilt frames, transfer trailers, and vehicles designed for collecting recyclables. Rear and side loaders are the most common collection vehicles for residential collection and can be loaded automatically or by hand. Front loaders are typically used to pick up large dumpsters for the collection of commercial or institutional waste. Roll-off container collection is more commonly used in rural areas. The containers are placed strategically throughout for

disposal facilities. Much larger transfer trailers are used for bulk transport of compacted waste from transfer stations to more remote disposal facilities; they can be either open-top or enclosed In developed countries of Asia and Australia, collection services are capital-intensive and mechanized. Container sizes are standardized, as are collection vehicles and large on-site containers, which may also be fitted with compactors. There are regulations governing source separation and separate collection of recyclables. Large trade and industrial establishments are responsible for the collection and disposal of their solid wastes. Private collection firms are contracted by small and medium enterprises. Collection rates are reported to be 90%. Collection services are being privatized. In the region as a whole roughly 20% of collection service is now contracted out to private waste collection companies with a view of cost saving.[6]

Transfer & transport

In large cities where the disposal sites are located far away, transfer stations are used to put wastes collected from several points into larger vehicles. Transfer stations in these cities often serve as processing centers where recyclables are separated for recycling/reuse. The transfer stations are usually mechanized, with adequate operation and maintenance programs. Transfer in most cases consists of the compactor truck or other type of collection vehicle (such as an open truck, pickup truck, or wagon) its load of waste into a pit or onto a tipping floor. A front-end loader or bulldozer usually loads the

[6] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Asia/Topic_b.asp 7.7.2006

waste onto a conveyor or a chute, from which it goes into a special compacting container. These are usually of large capacity and have high compaction ratios, and are used to densify the waste for more efficient long-haul transportation. In some cases, bulky waste and/or recyclables, especially corrugated cardboard, are separated on the tipping floor, both for their market value and to make the compaction more efficient. The baling of trash for long-distance hauling is not well developed in Europe, although long hauls are becoming more common as companies rush to exploit cheap disposal opportunities in Eastern Europe. In general, transfer stations dealing in residential waste are run by some public entity, but private operators are entering this phase of municipal solid waste management.[7]

Composting:

About 5% of the municipal solid waste stream in North America is now managed through centralized composting programs, which were insignificant prior to the mid-1980s. The compostable portion of municipal solid waste can constitute 30-60% of a community's waste stream. Composting programs have been designed for a variety of organic waste streams, including yard wastes (grass trimmings, leaves, or tree pruning), food wastes, agricultural wastes, and wastewater testament sludge. Another alternative, which has been used only on a limited basis in North America, is mixed waste composting. Mixed waste processing facilities accept unsorted municipal solid waste in

[7] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Europe/Topic_b.asp 10.7.2006

the same form as it would be received at a landfill or a waste-to-energy facility, and separate recyclable materials. The relatively small community of Guelph, Ontario, has been operating such a facility successfully since early 1996. There are currently about 20 MSW composting facilities operating in the USA, Twelve of which are relatively small-scale, processing less than 50 tons per day. The number of yard waste composting programs in the USA now totals over 3,200. Canada currently has over 160 composting projects throughout the country.[8]

The traditional open-air window process is used in some countries, especially China. In many Chinese cities and towns, there are no garbage dumps, the wastes being delivered directly by collection vehicles to peri-urban farms. The farmers are instructed to compost the waste in windrows or pits for a prescribed period of time, but they often do not do this if they are in urgent need of the organics. It is difficult for the authorities to monitor the farmers' practices. The compost is also increasingly contaminated with plastics and broken glass. The Beijing Sanitation Department is facilitating this practice by supplying sifting machines at the main dump site. Both Ho Chi Minh City and Medan are allowing the mining of compost from dump sites for fees.[9]

Incineration:

Due to high land prices, scarcity of landfill space and strict application of environmental controls developed countries are practicing incineration techniques. Many

[8] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Europe/Topic_b.asp 10.7.2006
[9] http://www.vista.gov.vn/moitruong/INFOWEB/ifov62.html 10.7.2006

regions in Europe, Japan, and the United States incinerate a significant portion of their municipal solid waste in a manner that meets current environmental standards.[10]

Up-to-date, full-scale incinerators are currently in service only in cities of more industrialized countries such as Australia, Hong Kong, Japan, Singapore, South Korea, and Taiwan. Singapore operate three plants, all of them are of same design that are, incinerating 90% of the daily refuse. Each day almost 5,800 tonnes of municipal solid waste is collected. No sorting of wastes is carried out before the municipal solid waste is fed to the incinerators (except that bulky wastes are crushed). The wastes are mixed and burned using rotation roller grates. There are many incinerators in Japan: Tokyo alone has thirteen. Some municipal solid waste incineration facilities in Japan are of two stages; ***pyrolysis***, followed by thermal combustion. China has one or two incinerators in cities like Shenzheng and Leshan. The one in Shenzheng was purchased second-hand from Hong Kong, when that city decided it could not be retrofitted to meet anti-pollution standards, but it has proved too expensive for Shenzheng to run. Nevertheless, Beihai, Shanyang, Guangzhou, Beijing, and Shanghai have begun constructing pilot plants, with foreign assistance. One reason given is that, although the municipal solid waste is not currently suitable for incineration, engineers want to gain operational knowledge for the future.[11]

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[10] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/SP/SP3/SP3_2.asp 15.7.2006
[11] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Asia/Topic_d.asp 15.7.2006

In Western European countries, it is usually the case that at least 35% and in some cases as much as 80% of the residential waste stream is disposed of through incineration. Currently, waste-to-energy (WTE) incineration is used to manage about 10-15% of the municipal solid waste stream in North America.[12]

Landfill:

When successive layers of compacted refuse are sealed between layers of clean earth each day, most of the deleterious effects of open dumps are eliminated. In such facilities, called sanitary land fills, no open burning occurs to foul the air, disease, bearing insects and rodents do not proliferate and the odor problem is minimal. Furthermore, sanitary land fills can restore landscapes scarred by mining or put an idle area to use.[13]

Landfilling is an unavoidable component of all European waste systems. In certain Northern European countries, less than half of the waste may be landfilled; while in southern countries like Greece and Spain, or Eastern European countries such as Hungary and Poland, virtually all waste finds its way to land burial. *The European Union Draft Landfill Directive* identifies three kinds of landfills; for hazardous waste, for municipal waste, and for inert materials. Monofills-landfills for one particular material- are also recognized in the directive.

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[12] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Asia/Topic_d.asp 17.7.2006

[13] Joseph H. Moran, W.H. Freemen, "Introduction to environmental sciences" Joseph H. Moran, W.H. Freemen and company, San Francisco, Page 387.

Landfilling was the primary means of managing solid waste in North America, handling about 65-70% of municipal solid waste had been handed by landfilling method. This represents a significant decease since the late 1980s, when landfills were used to manage over 80% of municipal solid waste. While the fraction of municipal solid waste that is landfilled has declined slightly over the past few years, the total amount generated continues to increase, resulting in a gross increase in the amount of municipal solid waste that is landfilled. Municipal solid waste landfills in the US are allowed to accept only non-hazardous solid waste, such as household garbage, except for small quantities of residential and commercial hazardous waste exempted hazardous waste management laws. Although there are approximately 3,500 municipal solid waste landfills operating in the US alone.

Definition of hazardous/nuclear waste and available drafts:

Hazardous waste needs a detail study as it entangles hospital waste material and the nuclear waste material here a brief study of hazardous waste and the laws regarding to it will be discussed.

Hazardous waste

Means the waste which is or which contains a hazardous substance or which may be prescribed or hazardous waste and includes hospital and nuclear waste.

Nuclear waste

Means waste from any nuclear reactor or nuclear plant or other nuclear energy system, weather or not such waste is radioactive.

Relevant laws about hazardous waste:

The Baluchistan Hospital Waste Management Council Ordinance 2001

Provides for the safe disposal of bio-hazardous waste, and others ancillary matters, generated by the hospitals and other establishments of Province of Baluchistan. The council setup under this ordinance has the power to enter in to contracts with private parties for the efficient disposal of hospital waste, which must comply with the requirements of public safety and convenience.[14]

Nuclear Regulatory Authority Ordinance 2001

Moreover section 2 (l) and 2 (m) of the Nuclear Regulatory Authority Ordinance 2001 defines nuclear material and nuclear substance.

Pakistan Penal Code

Apart from the general stipulation in the Pakistan Penal Code (enforced by the provincial government) regarding negligent conduct with respect to poisonous substance.

[14] The Baluchistan Hospital, Waste Management Council Ordinance 2001

Pakistan Nuclear Safety and Radiation Protection Ordinance (enforced by the ministry of science and technology)

The piece of legislation that deals specifically with the issue of hazardous waste at all explicitly is the Pakistan Nuclear Safety and Radiation Protection Ordinance (enforced by the ministry of science and technology). This ordinance prohibits all conduct regarding nuclear installation, nuclear material, irradiated or contaminated food or radioactive waste without a license. It imposes maximum imprisonment of seven years and a fine of Rs. 1,00,0000/-. The Pakistan Environmental Protection Council is implementing stringent laws for the discharge of toxic wastes.

History of Hazardous waste and reported case:

Solid waste management is the discipline associated with control of generation storage collection, transfer transport and disposal of solid wastes in a manner that it is in accordance with the best principles of public health, economic, engineering, conservation, aesthetics and other environmental considerations and that also is responsive to public attitude. It includes all administrative financial, legal, planning and engineer functions involved in the whole spectrum of solutions to problems of solid wastes thrust upon the community by its inhabitants.[15]

[15] Engineer Colonel Mumtaz Hussain, "Environmental degradation realities and remedies". Feroze Sons Pvt. Ltd. Lahore 1998 p. 283-287

Solid waste management virtually takes into compass all those activities that ensure that the waste is collected, handled and disposed as efficiently economically and with least environmental hazard as practically as possible.

SWM is not only the problem of developing countries the developed countries the problems of resources constraints coupled with apathetic attitude on the part of general public made the situation more worse.

However, in the developing countries the problem has become acute one. If we turn the pages of history we find high profile event that occurred in the 1960s and 70s heightened public awareness of the wide spread potential danger of hazardous waste. Some of these events are appended below: -

There are four important cases relevant to this but only love canal case will be discussed in detail.

Love canal, New York, Times Beach Missouri, Valley of Drums Kentucky, Minamata Japan

Love canal, New York

The Legacy of the Love Canal

More than a hundred years ago, work began on the Love Canal in the town of Niagara Falls, New York. The canal was to link Lake Ontario with the Niagara River, thereby providing water and hydroelectric power to the growing community. But in 1888,

the alternating current (AC) motor and long-range AC transmission were developed, making the canal unnecessary and uneconomical to industry. So construction was halted and the partially completed canal was abandoned.

From 1930 until the early 1950s, the 6-hectare (15-acre) canal site was used by the Hooker Chemical Company as a dump for tons of industrial chemicals, including pesticides and cleaning solutions—and perhaps chemical-warfare materials as well. In 1953, the company covered the dump with clay and sold it to the Niagara Falls Board of Education. Later, a school was built on part of the site and the rest was sold as house lots. In 1976, after several years of unusually heavy rains, foul-smelling leachate, began seeping through the topsoil onto the school playground and into the yards and basements of houses in the area. Soon there were reports of dying pets and serious health problems among human residents. In 1978, New York State Health Department investigators discovered a variety of alarming afflictions among residents, including headaches, sores, rectal bleeding, liver ailments, epilepsy, miscarriages, and birth defects. In July of that year, the state health commissioner called the former dump site a "great and imminent peril" and urged that pregnant women and children under the age of two leave the area. That same month, President Jimmy Carter declared the Love Canal neighborhood a federal disaster area. In August, 239 families were evacuated. Meanwhile, state and federal investigators had discovered 82 different chemical compounds, 11 of them known or suspected carcinogens. One of the carcinogens was dioxin, perhaps the deadliest of all manufactured chemicals.

That fall, the state began a massive clean-up of the dumpsite. First, it bought the homes of the 239 evacuated families and built a chain-link fence around them to keep out trespassers. Then it sent in gas-masked workers to dig drainage ditches within the contaminated area and around its periphery that would collect the leachate for removal and treatment.

By early 1979, the state had spent inure than $20 million, part of it in federal funds, on the clean-up. How much more would be necessary to complete the job, nobody could say.

The Love Canal episode forced the Environmental Protection Agency to consider regulating former dump sites more strictly, making a federal inventory of hazardous waste dumps, and establishing "butler zones" around such sites. Shortly after the Love Canal danger came to light in 1978, the regional director of the EPA was quoted as saying of the thousands of potentially dangerous landfills in the country, "We've been burying these things like time bombs."[16]

PRIVATE SECTOR PARTICIPATION IN SOLID WASTE MANAGEMENT

Private sector participation is a general term covering a range of option for involving the private sector in service provisions. P.S.P is involved in the waste management industries in Punjab over the last 17 years in formal as well as informal sectors.

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[16] Joseph M. Moram, Michael D. Morgan, James H. Wiersma, "Introduction to Environment Science" publisher, W.H. freeman and Company Kingsport Press USA, 1980, p. 213

Lahore compost Plant, Lahore (Mehmood Booti Plant)

Lahore compost project is one of the pioneering efforts of the City District Government in Lahore to introduce the concept of Public-Private Partnership. The project is based on an understanding that the City District Government would provide 60 acres of land free of cost and guarantee the supply of 1000MT of Municipal Solid Waste comprising primarily of organic waste to the plant site daily. The private sector party was responsible for the complete cost of plant and machinery, civil works and operational costs of compost plant.

The project was initiated in March 2005 and construction works were completed in May 2006. Initial project start up began in June 2006 and the plant is new fully operational at Mehmood Booti site which is also the designated landfill site for the city of Lahore. the initial investment cost of the plant and machinery was approximately US$ 3.5 Million which has been invested by the private sector party. The daily output of the waste so far is around 200MT/day which is being sold at a price of US$ 65/Mt to the vest agriculture sector in Pakistan.

Apart from the initial teething problems, the project is a very good example of private sector participation in management of solid wastes. The example set by processing of waste into compost through modern technologies is encouraging for other private sector entrepreneurs to invest in this sector. The City District Government Lahore also benefits by having a private sector party take care at least partially of the waste being

generated in the city without any capital investment. The CDGL in fact benefits by getting 10% share in the profits generated by the private contractor.

LCL will be responsible for any environmental hazard created owning to storage of solid waste and will be liable to provide appropriate treatment, in accordance with the provision of EPD Laws.

3.1 Waste Busters A pioneering NGO solid waste disposal

Waste Buster is an NGO working in Cantonment area Lahore, has shown a remarkable performance to in collecting the waste material in Cantonment area. This is a pioneering organization in solid waste management in Pakistan. This hired unemployed youth as social motivators whose job was to convince the 200 houses to use garbage bags provided by the program for disposal of daily garbage and Suzuki Pick Ups used by the LSP shall Pick Up the waste daily from their door step. This service would cost the household Rs.100/- (1.5 US$) per month and include 30 garbage bags, daily collection of waste and disposal at the local waste container of the municipality. This project was designed to create jobs for the unemployed youth, generate income from the service while cleaning up the area from garbage being dumped indiscriminately.[17]

The project was successful and gain popularity very quickly and got attention of the international media which portrayed this project as an example of self sustainable

[17] Waste busters, (a leading NGO) Shami Road Lahore

waste management practice throughout the developing world. International recognition brought the small NGO into the lime light and it was then renamed as "waste buster" since then the project has been replicated into many communities and now a leading contractor in waste management industry. The project concept was based on the need of the community to get a batter service and willingness to pay for it. Once the community itself defines the need and cooperates in the implementation of the project them it becomes easy for the project to sustain.[18]

Tehsil Municipal Administration Gujrat

Cantonment Board Lahore

Clifton Cantonment Karachi

Awam Sanitation Program Faisalabad

Chaklala Waste Management Project, Rawalpindi.

Solid Waste and environment and enhancement project Rawalpindi

Lahore Compost Plant Lahore

Multan Compost Project

[18] Private Sector Participation in solid waste management in Pakistan November 2006 "report".

Chapter # 3

SOLID WASTE MANAGEMENT IN PAKISTAN AND CASE STUDY OF DEVELOPED AND DEVELOPING COUNTRIES

SOLID WASTE MANAGEMENT IN PAKISTAN:

Solid waste management deals with the systematic administration of activities that provide for collection, processing and disposal of solid wastes, including the recovery of materials and energy. Solid wastes are produced by municipal, Industrial, mining and agricultural sources.

Wastes have always been present, they have been casually discarded; and in the past they have caused little concern. Solid W. M today is made difficult and costly by the increasing volumes of waste produced; by the need to control what are now recognized as serious environmental and health effects of disposal and by the lack of land in urban areas for disposal purposes, partly due to public opposition to proposed sites. The drawn of potential energy and materials that is represented by disposal of large waste is also increasing concern.[1]

SOLID WASTE MANAGEMENT IN KARACHI

About 80% of the total city area is being managed by City District Government Karachi. The total solid waste generation in Karachi is calculated to be around 5588 tons per day with generation rate of 0.34kg/c/d. Recent studies have revealed that approx.

[1] McGraw-Hill, "Ency. of Environmental Science" publisher, McGraw-Hill, company page 721

4528 tons/ day (81%) of the solid waste generated is from residential areas while 522 tons/day (9%) is generated from commercial centers and industries, 359 tons/day (6%) is from street cleaning and 179 tons/day (4%) is misc. waste.

The total waste storage capacity is around 4200 tons/day. The waste recovered is assessed to be around 700 tons/day or 17% of the total waste stored. The quantities of waste remained at the secondary storage site is around 3500 tons/day. The City District Govt. Karachi has vehicles to manage and pick up only 1800 tons/day (51%) while uncollected waste is around 1700 tons/day (49%) of the net stored waste. The secondary waste storage/communal bins include RCC bins, open masonry bins, circular bins and armroll steel contains which are insufficient to store the generated and collected waste. The municipal refuse collection vehicles include open and covered refuse vans, compactors, multi loaders and arm roll containers. The City District Govt. Karachi collect the solid waste from the communal bins and dispose it to the dumping site. Over 1300 informal/open dumpsites are present in Karachi, which are polluting and posing great threat to human health and in addition causing proliferation of rodents and insects.[2]

City District Gvot. Karachi spends around Rs.354 million per annum on waste collection and disposal out of which only Rs.70 million or twenty percent is recovered. Despite of this high expenditures, the existing level of sanitation is far below the acceptable minimum standards. No treatment of solid waste is being done at Karachi.

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[2]http://www.globnet.org/preceup/pages/ang/chapitre/capitali/cas/pakist.htm 22.7.2006

There is no sanitary landfill site functioning at Karachi. 8 acres of land dumping site at North Karachi has long been exhausted. 100 acres of landfill site at Korangi and 1600 acres at Jam Chakro near Surjani Town have been planned. Another site of 3000 acres at Dhabeji was identified by the previous municipal administrator. No planning and design of the site has been done so far. In the absence of appropriate waste disposal facilities, the solid waste is being dumped at unidentified places in the city. Waste burning is a common phenomenon found in the city.[3]

SOLID WASTE MANAGEMENT IN LAHORE

Lahore is the 2nd largest city of Pakistan with its population about 8 million with growth rate 3.6. Total area of City Government is 1770 Sq. km. There are 9 towns in Lahore with 150 Union Councils. Total Solid Waste generated is about 5200 MT./ per day with generation rate 0.65 kg./Capacity/day. In Lahore solid waste is collected by solid waste management department city district government Lahore which came into being on 1990. This department is headed by Zila Nazim.[4]

There is an urgent need of 270 millions for solid waste management Lahore, to establish one landfill site budget 85 Million and 70 Million for machinery. Quid-e-Azam

[3] Solid waste management department city district government Karachi.
[4] Solid waste management department city district government Lahore/District Officer Solide Waste Management Lahore.

Industrial Estate Kot Lakh Pat and Sundar Industrial Estate Kahana have entered in a contract with waste busters for industrial waste management.

Total number of employes in solid WMC. is 10745. Due to large population of the capacity of refuse collection and disposal is for below and the required level which leaves about 25-30% of solid waste uncollected per day, this shows the inefficiency and ineffectiveness of existing municipal solid waste collection service. Thus causing hazards to urban health and quality of life.

Collection process is more labor intensive and expensive in whole SWM system, which consists of storage, collection street sweeping, transfer transportation treatment and final disposal. In Lahore all type of waste is generated like as

Domestic Waste, Commercial Waste, Industrial Waste, Institutional Waste, Animal Waste, Hospital Waste

Lack of financial resources, institutional weakness, improper choice of technology and public apathy towards solid waste management has made this service far from satisfactory.

Responsibilities about SWM at district level are

a. Final disposal of solid waste

b. Arrangement and operational control of landfill site.

c. Arrangement for major repair of garbage vehicles through central workshop.

d. overall administration of SWM staff.

e. Collection of sanitation fee through SWM staff

And at town level function are operated.

a. Sweeping of the streets.

b. Primary collection of garbage from the residential/Commercial units.

c. Shifting of Waste to the Containers / Skips.

Comparison of Lahore with other cities a like Dehli and Karachi,

Lahore; one sanitary worker to handle 0.60 tons

Karachi; one sanitary worker to handle 0.42 tons

Dehli; one sanitary worker to handle 0.16 tons

There is no system of primary collection of waste in most areas of Lahore city. But in posh areas and middle class areas the waste is collected door to door and disposed of into bins / containers located at specific places for secondary collection. Containers,

skips and bins are used for temporary bulk storage of wastes. These bins, containers are unhygienic, as most of waste is more often seen outside the containers.

Streets sweeping is important component of primary collection but its condition is very poor because of poor infrastructure and improper road condition, rural areas are not swept daily. Transportation of waste is done through variety of vehicles such as arm roll, open trucks, compactors and tractor trolleys. Multiple manual handling of waste becomes necessary.

Generally no process of waste is done in the city except in few towns where composting is done on a limited scale. Disposal of waste is done in a most unscientific manner. Generally crude open dumping is adopted for disposal waste in low-lying areas or in Active flood plains of river Ravi. These sites emanate a foul smell and become breeding grounds for flies, rodents and pests and pose serious threat to underground waster resources. Thus the entire system of waste management in the city is out dated, unscientific and inefficient.

Major dump sites in Lahore are as;

Mehmood Booti, Saggian, Baghrian

Mehmood booti is the only site owned by CDGL, which can eater for not more than 30-35% the total waste generated rest of the waste is dumped into the low lying areas in and around the city.

Saggian also an open dumping site along the river. It is just 1 km away from the river. It is also an active flood plain with average depth of 4-6 meters. It receiving minor floods during the rainy season because of increased storm water and poor drainage system.

SOLID WASTE MANAGEMENT IN KASUR

Kasur is a very important city of Punjab. This is district headquarter. There are four Tehsils namely Kasur, Patoki, Chonian, Radhakishan. The population of Kasur city is 2,77,579. In Kasur District 166 tons per day municipal waste is generated and 75 tons per day tanneries waste is generated. While in tanneries waste 13,191 tons is saleable and 11,579 is non saleable annually.

In May 1995 *KASUR TANNERIES POLLUTION CONTROL PROJECT* was started. Out of 595 tanneries 180 tanneries exist in and around the city of Kasur. The waste effluent from these tanneries in Kasur are adversely effecting the irrigation as well as the surface water for drinking. Recognizing this problem, the government had initiated of a project at an estimated cost of 264 million (including grant assistance of US $ of 6.8 million from UNDP) for the control of pollution from tanneries in Kasur. The tanneries association of Kasur will meet 30% of the total cost. The above amount will be spent for reducing toxic effluent, technology transfer, recycling chrome recovery, instutions of in house pollution control in the tanneries.

There is no proper land fill site for municipal waste while one site has been setup for tanneries waste by the help of Kasur Tanneries Waste Management Agency. For municipal waste Tehsil Muncipal Administration is responsible.[5]

Only 50% of generated waste is collected but 50% remained uncollected in the streets of Kasur which is causing many of the diseases and also polluting the under ground water of city Kasur.

SOLID WASTE MANAGEMENT IN SIALKOT

Sialkot is a very important city of Punjab, its population is 2723 million (1998 census). Total villages are 1579 and 124 union councils. There are four tehsils namely Sialkot, Daska, Pasror, Sambrial. Literacy rate is 59% which stands at fifth place in the province. Main crops are wheat, rice, sunflower, and potatoes. Main industries are sports goods, sports wear, surgical instruments, leather works and agricultural machinery. Total exports in 2005-2006 were approximately $ 700 million, there are 170 rice mills, 516 sports goods factories, 234 tanneries and 1280 surgical instruments are main registered polluters industries while there are total 2414 polluter industries. There are 234 tanneries spread over 7 different locations. Sialkot is industrial hub of Pakistan in leather, surgery and sports goods. The impact of the industry of leather environment is recognized in terms of discharge of chromium and combined pollutants. The pollutants from this

[5] Office of the District officer Environment Sialkot/District Officer Environment Sialkot.

industry are mostly chemical waste and other related effluents which pose threat to the land, sewerage, streams and underground water.

The government with the help of PAKISTAN TANNERIES ASSOCIATION (PTA) is trying to address these impacts through establishment of leather complex at Sialkot. This complex in the industrial estate will be developed on an area of 250 to 300 acres which is on Wazirabad Sambarial Road. This complex will house all necessary infrastructure facilities and utilities. This complex will have an independent treatment facility for effluent and / or chromium recovery plan. The treatment plan will bring effluent in conformity with the national environment quality standards.

In Tehsil Sialkot solid waste is generated 500 ton per day and lifted only 300 tons per day while 200 tons per day remains un lifted in the streets of Sialkot. In percentage 60% is lifted and 40% is un lifted. In Tehsil Daska 80 tons per day solid waste is generated and 60 tons is lifted while 20 is un lifted. In Tehsil Pasrur 17 tons per day is generated and 12 ton is lifted while 5 ton remains un lifted. In Tehsil Sambrial 50 tons per day solid waste is generated 20 is lifted while 30 remains un lifted.

The solid waste is collected at various collecting points and is lifted through tractor trollies for disposal at damping grounds. The un lifted solid waste is naturally decomposed and disposed through open nullahs/plots. Unscientific damping and un lifted solid waste along the roads and open areas etc, causes putrefaction and resultantly the source of epidemic disease and other health problems. Polythene bags among the waste

material are causing infertility of land, moreover, the mixing of industrial and municipal wastes, has been making the land and underground water toxic.

The given situation demanded an immediate action. The govt. established two committees to look into the complexity of situation and implement the hospital waste management rules 2005. This committee chalked out a comprehensive plan. Allama Iqbal Hospital Sialkot was focused where *Hamdard Citizen Community Board* installed an incinerator.

The high cost of land in Sialkot has rendered the progress on the establishment of Sialkot Tannery Zone slow. Though the programme has not halted, anyhow, the working speed speaks that, to further delay will increase its cost and give birth to new complications. PEPA in the recent months has show its performance by issuing notices to 55 industrial concerns in Sialkot under section 12 of PEPA the result of these notices are yet to be known.

The above discussion and the given figures and facts go long way to prove that both in method and operation the Sialkot district needs a lot to improve its system of collection and disposal of waste material. The bureaucratic hurdles and other unseen obstacles let the programmes delay. The classical example is Sialkot Tannary zone. The given situation demands scientific way of handlog the problem. A proper mechanism of waste collection and its disposal needs to be put into practice. Any delay in this regard will give birth to numerous health related complications for the people of the arrear.

CASE STUDIES FROM DEVELOPING COUNTRIES

Solid Waste Management in Delhi:

In Delhi, Municipal Solid Waste is managed by New Delhi Municipal Council & Municipal Corporation of Delhi. About 4600 tons of waste is produced daily in Delhi. According to research made by National Environmental Engineering Research Institute in June 1996, municipal solid waste consists indicated low organic carbon content in the solid waste where the C/N ration ranged from 1:20 to 1:30 and the calorific value was between 528 and 875 kcal per kg with high moisture content. The system for the collection of solid waste adopted by MCD and NDMC is quite primitive. Waste collecting *receptacles* in use are masonry structures called a dhalao / dustrbin, and trolleys. The dhalao is a masonry structure with a roof. A dustbin is a roofless masonry structure and at some places it is provided with an iron mesh cover. The NDMC uses trolleys, which rest on wheels and are lifted by refuse collector. The detailed survey indicates that entire collection system is not satisfactory. The maintenance of waste collection centers is poor. Waste receptacles are not properly sited as no guidelines have been formulated for siting of bins. Siting is based on the availability of area rather then the convenience of the public. There is no system of door to door collection and people has to bring the garbage to waste receptacles that are unhygienic because of spill over due to the irregular lifting of garbage. The most common transportation fleets used trucks, tippers and refuse collectors. The authorities confirm a shortage in the transportation

fleet. Waste-collecting centers are not cleared on daily basis. Loading of garbage in the trucks is a manual process and a limited quantity of garbage is lifted by using front-end loaders. Most of garbage is transported in open trucks without proper covers. The collection and transportation systems are not compatible. The masonry structures, *dhalaos* and dustbings, are not compatible with front-end-loaders. These loaders damaged the walls of the receptacles. The trolleys in use are old, and the hydraulic system of the refuse collectors also is not well maintained. There are three landfills sites in Dehli and an area of 130 acres is used for Land filling. But these sites have not been prepared for sanitary landfill operations. Landfill sites are encroached by waste pickers and stray animal due to lack of fencing. On an average, 3600 metric tons of waste is available everyday for land filing and therefore approximately 1000 metric tons per day is disposed of in a disorganized manner. MCD and NDMC have a few small compost plants. Each plant produces 80 tons of compost daily. The efficiency of the plants, however, is not satisfactory.

Solid Waste Management in Colombo City:

Solid waste collection and disposal in Sri Lanka is totally a function of the local authority. About 600 tons of solid waste is generated daily in the city of Colombo. The density of Colombo city's waste was found to be 450 kilograms per cubic meters according to tests carried out by the CMC in 1991. The bulk of waster (81 percent) is organic materials from vegetable markets and households. Hence about 15 percent of the

waste is recyclable and most of it is paper. Due to the very high components of organic materials in the municipal waste the moisture content is also as high as 40 percent.

About 30 percent of the municipal budget of CMC is allocated for solid waste management. The door-to-door collection is not in practice in Colombo municipal area. According to the municipal law, municipal vehicles or the labourers are not allowed to enter into the private roads or the private premises for garbage collection. They collect waste only available on the public and municipal roads. Nearly 1500 low income settlements scattered throughout the municipal area are considered as private properties. Therefore, most common waste collection systems are the communal storage and the curbside collection. Both these systems have the disadvantage of waste picking and waste littering by animals on streets and into open drains. About five years ago Colombo municipality gave polythene bags to households to use them as waste disposal bags. However, it did not help to overcome such problems because bags were left for long at the places of collection.

The process of collection in Colombo city generally involves loading from curbside into handcars which dispose into transfer bins at secondary collection points. CMC has about 2,000 secondary collection points. Some secondary collection points have no containers and waster is simply disposed on the road side. In certain places containers and collection bins are not adequate for the waste collected. Waste is transferred or loaded into compactor trucks and tipper for final disposal from the

secondary collection points. Secondary collection process involves a double handling of waste. Household waster is collected twice a week while commercial waster is collected daily. According to the CMC, the collection network covers nearly all areas of the city. In many occasions, due to the inadequate vehicle maintenance and temporary breakdown in service, uncollected waste and left out remain for more than two days at secondary; collection points.

None of the usual methods of treatment such as size-reduction, composting or incineration are carried out by the CMC. All waster, therefore, is disposed on open dump sites located in the adjoining local authorities due to the none availability of lands within CMC. None of municipal sites are qualified to be sanitary landfills. A potential landfill with a seven years capacity has been identified thirteen kilometers.

Vehicular fleet has compactor trucks (38 nos), tippers, skip hoist trucks, tractor and trailers (5) road sweepers, bulldozers, waster compactors, loaders and handcarts (323) and 2100 labour force. In relation to the amount of waste collected it was found that the CMC has 4 persons per m. ton of waste. In CMC, with a largest fleet of mechanized vehicles and labourers, cost per m. ton was Rs.327.

The city of Colombo is divided into 6 districts for the purpose of cleansing administration. Each district consists of 6 to 8 wards, total number of wards in CMC is 47. Each district has a solid management depot which is managed by a trained engineer with overseers, their assistants and labourers. The entire collection effort is coordinated at

city level by a superintending engineer who is working under a deputy municipal engineer. In all other urban local authorities in Sri Lanka the subject of solid waste management is under the Chief Medical Officer of Health.

Most of the recyclable waste is recovered at various stages along the waste stream. The recovery of recyclable waste material is a highly organized sector in Colombo in the informal sector. It is habit even in the middle income society in Colombo that waste materials which have some value of reuse or recyclable are not thrown away. Paper, milk and beverage bottles and cans are generally separated out and kept aside to sell them to the waste buyers who go from house to house to collect recyclable materials. Apart from them there are poor people (scavengers and street sweepers) who collect materials from the secondary collection points and from final dumping grounds. Municipal workers (Street sweepers and city garbage collectors) are also involved in sorting the waste during the collection round and selling the recovered materials to middlemen who are located on the route to the landfill. On a rough estimate it is found that CMC collectors spend about 20 percent of their time in sorting out recyclables from for sale.

Solid waste collection and disposal has been a major issue in Colombo. It is not only an environmental issue but also a socio-political problem. CMC has already used its all vacant lands for waste disposal. Due to the rapid urban growth, it has been a major difficulty to find alternative lands for landfills even from adjoining local authorities. In

view of the above, the government has given priority for the solid waste problem in urban development programs. Urban Development Authority with the UNDP / World Bank assisted Metropolitan Environmental Improvement Program (MEIP) in Colombo has completed a major environmental management study. Based on recommendations of this study, a land has been identified for a large sanitary landfill project. Solid waste management has been a priority area in all donor funded urban development projects in Colombo. Colombo municipality has increasingly recognized the importance of recycling and reuse. According to the municipal engineering department, composting has been proposed by at least 15 studies with proposals using sophisticated technologies. Several pilot projects are being carried out by CMC to test the financial and marketing feasibility of large scale compost production.[6]

CASE STUDIES FROM DEVELOPED COUNTRIES:

Solid waste management in Hong Kong

Velma I. Grover et all has carried out a research on solid waste management system in Hong Kong and described the system as under.

Population of Hong Kong was reported to be 6.68 million (17). Total waste generated was about 6.02 million tones per year (18). About 33% (roughly 1.56 million

[6]http://www.globnet.org/preceup/pages/ang/chapitre/capitali/cas/srila_c.htm 25.7.2006

tons) of this was recovered from export or local recycling. Waste reduction activities were voluntary and most of them are ephemeral or adhoc. Organized waste reduction activity is a recent phenomenon. In 1995, a 'Use Less Plastic Bags Campaign' was organized by the government and the retail industry to attract some large retial outlets to participate. Purpose of the campaign was to reduce plastic consumption for the first five years. Over 35 million plastic bags were reduced in the first year and some retailers reduced it to 33% of their plastic bags consumption. (19). The material collected by scavengers from the garbage included aluminum cans, copper, newspapers, cardboard, metals, clear glass bottles, rags, old white and brown goods etc. Collection and transfer services are capital intensive and mechanized. Container sizes are standardized, as are collection vehicles and large on site containers, which may also be fitted with compactors. Climatically, Hong Kong is a suitable place for composting. However, economic viability is the chief handicapping factor in its development. Contrary to the recycling, direct government involvement is found in composting. The government-run composting plant is the *Shaling Composting Plant.* The composting process takes 51 days to complete and currently only big waste is composted in the government composting plant. It has a capacity of treating 50 m^3 of waste per day. The average space required for 1 m^3 of waste is about 0.8 m^2. Hong Kong a small city is particularly vulnerable to the lack of land for waste disposal. However, landing filling is still the major disposal

method in Hong Kong. There were once three incinerators and the last one was closed in 1997.[7]

Solid Waste Management In Prato, Italy:

The *Azienda Special Muncipalizzata per 1' Igine Urbana (ASMIU)* is responsible for the provision of waste management services for the community of Prato. Population of prato is about 168000. Total waste generated is 90000 tons/year out of which 5% waste is composted, 10% is recycled, and 85% is dumped in landfill. ASMIU manages the treatment of all solid waste arisings from Prato, but they do not have control over the management of final disposal at the Pisal landfill.

A bring system for separate collection was established in Prato in 1990. The initial system comprised collection points with blue (1100 litre) containers for paper, plastic, metals, and glass and black (1200 litre) containers for rest waste. This scheme worked well but high contamination rates and liquid soaked paper were common. In 1995, the original scheme was expanded with some modification. This time the material requested for collection in the mixed material containers were changed. This resulted in paper and cardboard being collected in yellow (1100 litre) containers with wide but narrow openings and plastic, glass and metal being collected in blue containers with

[7] Grover, I.V. Guha, B.K, Hogland, W. McRae, G.S 2000, "Solid Waste Management" Oxford and IBH, Publishing company (pvt). Ltd. New Delhi.

appropriately sized round openings. The total amount of material collected has remained constant while the contamination rate has decreased significantly.

ASMIU operate one waste transfer station where waste is baled for transport to the landfill. To MRFs operate within the Prato area. One is owned by ASMIU while other is privately owned. Organic material is delivered to a privately owned composting facility where high quality compost having a stable market is produced. The composting gate fee is less expressive than landfill disposal. The residue from the MRFs and all of the rest waste is transported to the Pisa land fill that is privately owned having a high gate fee and when this is added to the national and regional landfill taxes, materials recycling and composting become financially viable options.

Summary of Solid Waste Management in Developing Countries:

Solid Waste Management has emerged as one of the important areas of overall urban policy planning and management.

Waste Reduction:

Developing countries often have an extensive sorting system but it is normally carried informally by scavengers. The engines of waste recovery and recycling include; scarcity or expense of virgin materials, the occurrence of absolute poverty, the availability of cheap labour and the large markets for goods and products made from recycled plastic and metals. The traditional practices of repair and reuse, and the sale,

barter, or gift of used goods and surplus materials, are an advantage to these countries. Quantities of non-organic post-consumer wastes would be higher without them. Waste reduction that could be achieved by legislation and protocols (such as agreements to change packaging) is not, at present, a high priority in these countries, although some are now moving in this direction. A municipality of Kuala Lumpur is currently trying source separation with a higher level of funding. Recently, support for community organizations to promote source separation has been funded under UNEP's Asia-Pacific 2000.

Repair industries are important in waste reduction in such countries; second hand markets thrive, some being very large, such as those in Bombay, Calcutta, and New Delhi. There are complex networks that serve the recovery and recycling of synthetic materials, inert wastes, and organics. Every useful sort of household, shop, or institutional waste is reused or traded. Materials include clothes and rags, small goods, bottles, plastics of all kinds (especially milk pouches), metals, toys, and cinders from coal fires. Food wastes are sold to poultry and big farmers, construction wastes are reused and the residues are taken as fill for road repairs. Animals play a significant role in the reduction of organic wastes in many places, especially smaller cities and towns. It has been calculated that up to 50% of domestic and restaurant organics are fed to animals. NGOs in these poorer countries have assisted waste pickers in forming cooperatives to obtain source separated wastes. The best known example is the work of the Self Employed Women's Association in India. Cooperative organization in waste

management, however, is not developed to the extent as in the Andean counters of Latin America. Recyclables are extensively traded, even internationally, particularly in the subcontinent. For instance, almost all the recyclables of Nepal are exported to India. Surplus materials from Calcutta are exported to Bangladesh. India imports large quantities of waste paper from western countries.[8]

Collection:

MSW collection and transfer in the East Asia/Pacific region is, in general, still the responsibility of the public sector, although there is a trend toward contracting out some services. Various collection and container systems are used. The use of muscle powered vehicles, including wagons, animal-drawn carts, or rickshaws, is common. There is both door-to-door collection and indirect collection. The level of service is low, and the generators often have to bring their wastes long distances and place them in containers that are sometimes difficult to use. These points are known as communal collection points. Communal collection is very common in developing countries. The practical aspects of collection routing, set-out practices, vehicles, collection schedule are highly variable, involve primarily manual labor, often of women and children, and depend on specific circumstances. In most developing countries and cites, there are many areas that receive no collection at all. For example, collection may miss large areas of poor or squatter settlements; areas that are hilly ; neighborhoods with unpaved or impassable

[8] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Asia/Topic_d.asp 5.8.2006

streets; or whole areas where houses are too close together for collection vehicles to get through. Waste collection crews, waste pickers, or independent buyers may be involved in both collection of waste and separation and recovery of materials. A common aspect of collection in developing countries is acute lack of adequate service, particularly in poor or marginal areas. Collection and transfer are labor-intensive, although Metropolitan cities have a fleet for motorized collection. Manually or mechanically loaded compactors are often used in markets and commercial establishments. Handcarts are used by the municipality in the congested areas and communal bins are placed at appropriate locations for deposit and storage. Often, collection crews are not responsible for picking up waste that is not in the containers so the containers site remain messy and obstructed even after a new container is placed there. In the poorer countries, collection rates have been reported to be 50%. In developing countries or rural areas, containers include bags, pots, plastic or paper bags, cane or reed baskets, urns, boxes, clay jars, or any kind of container available. In some places, waste is stored in a pit in front of houses while awaiting collection. Plastic bags, which are increasingly available, are becoming a problem for composting.[9]

Shortages of collection vehicles, inadequate transfer points, traffic congestion, and lack of public compliance are factors affecting collection efficiency, resulting in low waste collection rates. The lack of coordination and overlapping of responsibility among

[9] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/North-A/Topic_d.asp 9.8.2006

government agencies and different levels of local government also contribute to the problem.

Transfer & Transport

Most developing countries have insufficient and inadequately designed transfer stations. Financial constraints and the lack of education and training severely limit collection and transfer services in the cities and towns of poorer developing nations.[10]

Composting:

About 60% of the municipal solid waste in developing countries is organic. The waste usually has higher moisture content, hence suitable for composting. Almost all the larger cities of the developing countries in the region in the past installed imported mechanical composting plants. Most are now defunct and the remaining plants include; (a) high operating and maintenance costs compared to open landfilling; (b) high cost of compost as compared to commercial fertilizers; (c) incomplete separation of materials such as plastic and glass and (d) poor operation and maintenance of the facilities. Backyard composting is casually practiced in areas where there are home gardens. In Bangalore, the Waste Wise Project of the Mythri Foundation and the Centre for Environmental Education are both combining worm culture with composting on a small scale on land provided in local parks by the City. The Corporation of Calcutta has leased

[10] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Europe/Topic_e.asp 9.8.2006

out dump land for vegetable farms. Small dumps near squatter settlements are regularly farmed.[11]

The development of small scale, community-based composting in Jakarta represents a good example of composting in a developing country. An assessment of small-scale, multi-source composting projects in Jakarta and Banding, suggested that such composting can achieve important reductions in wastes and contribute to the improvement of the neighborhood environment. Critical to the lasting success of such projects are good management and market research, and a consistent institutional support system.

Incineration:

Incineration Presently, there are various factors that make incineration difficult or inadvisable in many developing countries. Notable among them are high capital and operating costs, low cost of sanitary landfilling, high moisture and low energy content and unavailability of technical infrastructure including pollution control equipment. Given these conditions, incineration with or without energy recovery does not appear to be a sound option for most situations encountered in developing countries. It is not surprising, therefore, that there are few examples of successful MSW incineration in such countries and several examples of premature attempts to adopt this technology. However, some developing countries have considerable technical expertise and capital necessary to

[11] Environmental protection department, Hong Kong 1996: A review of Hong Kong 1995. Hong Kong.

install and operate incinerators. It may be possible, therefore, to introduce this technology into such countries where landfill space is scare in the surrounding area. However, even in cases where the initial capital costs of an incinerator are party or wholly subsidized by an outside country or organization, the costs of properly operation and maintenance of an incinerator and its environmental controls will still make it unattractive option in most of the developing countries.

Landfill:

Landfill in developing countries, the main disposal practice for MSW is open dumping. Very often landfill sites are swamp lands or low-lying areas, the wastes being used for reclamation. In the Indian subcontinent, and for smaller cities and towns, it is a crude dumping of waste, sometimes with sparse cover, and sometimes, combined wit partial burning in the dry season. Although clay liners are occasionally used, little consideration is given to the water table and groundwater pollution and/or gas migration. The might percentage of organics, combined with much plastic which forms layers when compacted, contributes to the build-up of methane gases at dumps resulting in fire and health hazard. Gas capture has been tried on an experimental basis in just a few cases, for instance, in New Delhi, where gas is supplied to a nearby hospital. In India, there is some cultural inhibition for using gas from dumps for domestic cooking. In cities of developing

countries open burning of refuse is common in landfill sites to reduce volume. This is especially done where the authority cannot afford bulldozers to compact the deposits.[12].

Public Education:

In India, Pakistan, and Sri Lanka in the past ten years, citizen groups have been spearheading changes in public awareness of waste and recycling issues. Community education is a component of the solid waste management program in Karachi, funded by the Asian Development Bank. Most public awareness efforts are directed to children, since they are responsive and easily accessible, and it is believed that they can influence adult attitudes. In Karachi an NGO (Gul Bahoo) has devised school recycling projects. In a few schools dry and wet waste in exchange for toys. Organizations like Civic Exnora in India devote a considerable amount of time to public presentations on litter problems and the potential for cooperation to organize better waste collection in neighborhoods. Community groups are paying more attention to source separation to enhance recycling and assist waste pickers.

Private Sector Involvement:

Bureaucratic constraints, financial limitations and lack of relevant managerial, financial and technical skills and expertise have made it difficult for govt. agencies to manage the solid waste in a proper manner. Private sector is more efficient for the

[12] http://www.unep.or.jp/ietc/ESTdir/pub/MSW/RO/Asia/Topic_j.asp 12.8.2006

provision of Municipal refuse collection and disposal service. The advantage of the private sector involvement is evident in Angola. Solid waste removal for Angola's capital city, Luanda, was transferred to a private company in 1997 that resulted in noticeable improvements in the range of the area covered, as well as the frequency and regularity of the collection service provided.[13] This system is also in practice in Lahore but still could not be successful.

[13]Schubler, Peter, Karl Wehrle and Jurg Chiristian, "Conceptual Frame Work for Municipal Solid Waste Management in Low Income Counties" UMP working paper series 9, SKAT, Switzerland. 1996

Chapter # 4

RULES AND REGULATIONS ABOUT SOLID WASTE MANAGEMENTS IN PAKISTAN AND JUDICIAL PRECEDENTS

Solid Waste Management Policy:

The planning & development Division at the federal level and planning & development department at the provincial levels are responsible for the preparation of development plans and allocation of resources. At the federal level, the Ministry of environment is responsible for the development of policies and programmes under the environment themes. The Pakistan Environemntal protection (PEPA) and provincial EPAs are the main regulatory bodies for the implementation of Pakistan Environmental Protection Act, 1997.

In Pakistan municipal governments are usually responsible agencies for collection and the disposal solid waste but the magnitude of the problem is well beyond the ability of any municipal government. Under the recently developed local government system, the town / Tehsil municipal administration (TMAs) are responsible for the solid waste collection, transportation and disposal. However, TMAs are unable to cope with continuously increasing volumes of municipal waste due to inadequate funds, lack of rules and regulations standards, lack of how on the subject, lack of expertise and lack of collection vehicles and equipment.[1]

[1] Ministry of Environment, "Data collection for preparation of national study on privatization of solid waste management in eight cities of Pakistan" 1996

The Government of Pakistan enacted the Pakistan Environment Protection Act (PEPA) in 1997, which is the most recent and updated legislation on the environment. This piece of legislation provides a frame work for establishing federal and provincial environmental protection Agencies (EPAs). One of the functions of Pak-EPA is to assist the local councils, local authorities, Government agencies and other person to implement schemes for the proper disposal of waste so as to ensure compliances with the standards established by it.

Presently the legal rules and regulation dealing with solid waste management in Pakistan are as under: -

- Section 11 of the Pakistan Environmental Protection Act prohibits discharge of waste in an amount or concentration that violates the National Environmental Quality Standards.
- Draft Hazardous Substances Rules of 1999.
- Islamabad Capital Territory Bye Laws, 1968 by Capital Development Authority Islamabad.
- Section 132 of the Government Act 1924 deals with Deposits and disposal of rubbish etc.
- Provisions contained in the local Government Ordinance, 2001.

EXISTED LEGISLATION IN PAKISAN

Waste Management and Legislation in Pakistan

Under this topic we will discuss and try to examine the existed international, regional, national, local and cantonment legislation also tried to find out the loopholes in existed frame work.[2]

Powers and process of legislation

Constitution

Since its creation in 1947 Pakistan has had three constitutions, adopted in 1956, 1962, and 1973. The 1973 constitution was the result of a consensus among the political parties then represented in the parliament and was formally revived in November 2003. The Constitution sets out the procedure to be followed for promulgating a statue.

The Federal Legislation System

Under the constitution, legislative power is vested in the bicameral Federal Legislature. The procedure for promulgating a statute requires a Bill to be passed by both Houses of Parliament – the National Assembly and the Senate. When a Bill's passes

[2] Mr. Jawad Hassan, "Environmental laws of Pakistan" published by book biz Jalal Centre, 59-A Mozang Road, Lahore, 2006 p. 34

through both Houses, it is presented to the President of Pakistan for assent and becomes an Act of parliament upon receiving such assent (eg. PEPA).

In the absence of the National Assembly, ordinances are promulgated by the President pursuant to Article 89(1) of the Constitution. Under this Article, the President may, if satisfied that circumstances exist which render it necessary to take immediate action, make and promulgate an Ordinance. Such Ordinances have the same force and effect as an Act of Parliament (e.g. PEPO).

The Pakistan Environmental Protection Agency (EPA) was established under section 5 of the PEPA. The Power to make Rules is held by the Government (e.g. The 2005 Hospital Waste Rules, 2003 Hazardous Substances Rules, National Environment Quality Standards Rules (NEQS). The power to make Regulations in the cases appointed under Section 33 of the PEPA is held by the EPA but requires the approval of the Federal Government. Such regulations may provide for:- providing procedures for handling hazardous substances, laying down of guidelines for preparations IEE and EIA assessment, - monitoring and measurement of discharges and emissions, etc. (e.g. Review of IEE/EIA Regulations, NEQS Regulations).

Provincial Legislation

Pakistan is divided into four provinces of Balochistan, the North-West Frontier Province (NWFP), Punjab, and Sindh. Each Province has a directly elected Provincial

Assembly headed by a Chief Minister. The Provincial Governments may legislate in certain areas for example health, education, agriculture, municipal planning and roads (e.g. The Punjab Land Acquisition Act).[3]

Environmental & Alternative Energy Department Government of Sindh

The Sindh prohibition on manufacture, sale and use of polythene bags ordinance 2006 prohibits the manufacture, sale, and use of polythene bags having thickness of less than thirty microns. Any person who contravenes this law shall be punished with imprisonment for a term which may extend to three months or with fine which may extend to rupees fifty thousand or with both. In case of repeated offence the imprisonment may extend upto six months and the fine may extend upto rupees one hundred thousand.[4]

Action to control this public nuisance will also be initiated under section 133 and section 144 of the criminal procedure code.

The power to make and promulgate an Ordinances is bestowed upon Provincial Governors by Article 128(1) of the Constitution in respect of matters falling within provincial legislative authority (e.g. Punjab Local Government Ordinnace).

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[3] Asmat Kamal, "Environmental Legislation in Pakistan" Lahore, 1996 p. 85
[4] Mr. Jawad Hassan, "Manual of Environmental Laws in Pakistan" Sindh Law General Publication, Lahore, 2006. p. 55

Relevant Laws:

The Baluchistan Hospital Waste Management Council Ordinance 2001

Provides for the safe disposal of bio-hazardous waste, and others ancillary matters, generated by the hospitals and other establishments of Province of Baluchistan. The council setup under this ordinance has the power to enter in to contracts with private parties for the efficient disposal of hospital waste, which must comply with the requirements of public safety and convenience.[5]

Local Legislation

The 2001 Punjab Local Government Ordinance confers the Zila Council, Tehsil Council, Town Council and Union Council the power to make bye-laws to carry out the purposes of the Ordinance sets in Part-II of the fifth Schedule. Solid Waste Management is there under seen as one of the competences of Local Governments (e.g. City District Government Lahore, Solid Waste Management Bye-Laws, 2005).[6]

Cantonment

It is to note that the Lahore CDG bye-laws do not apply to the Lahore Cantonment or Defence areas. This is because these areas do not form part of the City District of Lahore and are governed by the Cantonment Board and the Defence Housing

[5] The Baluchistan Hospital, Waste Management Council Ordinance 2001
[6] "PLJ" Pakistan Law Journal Publisher PLD Lahore 2006

Authority respectively. For the Lahore Cantonment the Pakistan Cantonments Act 1924 and Several National Rules and Regulations as well as some local By-Laws are applicable.

National Laws and Regulations

The Pakistan Environmental Protection Ordinance 1983 was the first specific governmental commitment to environmental improvement and to deal with the matter of waste. A federal legislation the Ordinance established the Pakistan Environmental Protection Council (PEPC), headed by the President of Pakistan, as the supreme environmental policy-making body in the county and the Pakistan Environmental Protection Agency (Pak-EPA) at the federal level and Environmental Protection Agencies at provincial level in all four Provinces of the State to administer and implement the provisions of the Ordinance. In 1997 the improved Ordinance was enacted, after the approval from the Parliament as the Pakistan Environmental Protection Act (PEPA).

The 1997 Act retained the institutional framework of the 1983 Ordinance and provides for the protection, conservation and improvement of the environment, for prevention and control of pollution, and for the promotion of sustainable development.

The Act defines waste as any substance of object which has been, is being or is intended to be, discarded or disposed of, and includes liquid waste, solid waste, waste gases, suspended waste, industrial waste agricultural waste, nuclear waste, municipal

waste, hospital waste, used polyethylene bags and residues from the incineration of types of waste.

The factories Act 1934 an act regulating labour and factories also deals with the disposal of waste under section 14 of the act.

Cantonment Legislation

Within the cantonment waste management is the responsibility of the responsible officers in charge for sanitation and the prevention of disease. Every Cantonment Board shall by law provides or appoints in proper and convenient situations, public receptacles, depots or places for the temporary deposit or disposal of household rubbish, offensive matter, carcases of dead animals and sewage. The board may issue directions as to the time, manner and conditions the rubbish may be removed along a street or may be otherwise disposed of (The Cantonments Act, Sect. 132).[7]

International Conventions 1994

In 1994 Pakistan joined the **BASEL CONVENTION ON THE CONTROL OF TRANBOUNDARY MOVEMENTS OF HAZARDOUS WASTE AND THEIR DISPOSAL.** A central goal of basel convention is "environmentally sound management" (ESM) the aim of which is to protect human health and the environment by minimizing hazardous waste production whenever possible. ESM means addressing the issue through an "integrated life-cycle approach", which involves strong controls from the generation

[7] The Cantonments Act, Sect. 132

of hazardous waste to its storage, transport, treatment, reuse, recycling, recovery and final disposal.

JUDICIAL PRECEDENTS

Case Law:

MUHAMMAD YOUSAF and 15 others---Petitioners

versus

PROVINCE OF THE PUNJAB

through Secretary, Local Government

and 6 others---Respondents[8]

(a) Under section 2, 12 and 16 Pakistan Environmental Act 1997 & Article 9, 14 and 199 Constitution of Pakistan

Constitutional petition---Dignity of man and privacy of home--- Constitutional guarantee—Site located in vicinity of the city being used by Municipal Corporation City District Government for dumping of solid:. Waste---On account of dumping of solid waste, there were heaps of, garbage and area, was full of dirty material---Hundreds of people had died in locality due to various diseases caused by dumping of solid waste---Enormous difficulties faced by people of locality could not be imagined--People of such locality being citizens of the country were entitled to equal protection of law---Pollution

[8] 2003 CLC 576

in the form of slow poisoning was being faced by people of the said locality since long---Duty of City District Government was to redress grievance of people of such locality---High Court treated Constitutional petition as public interest litigation and directed the City District Government to make alternative arrangement and select suitable place, for dumping of solid waste away from residential areas within one year, and till then take all necessary possible steps to minimize effects of dumping ground---Constitutional petition was disposed of accordingly.

(b) Pakistan Environmental Protection Act (XXXIV of 1997)---

----Preamble, Ss. 2(xxxiii), 12 & '16--Constitution of Pakistan (1973), Arts. 9, 14 & 25---Pollution free environment, necessity of Responsibility of citizens and public functionaries to reduce pollution, emphasized.

It is a matter of common knowledge that pollution creates dangerous gases etc. which are injurious not only to human life, but also to lives of animals, birds and plants.

Pollution is the form of slow poinsoning.

Problem of pollution is more dangerous as compared to destruction by hydrogen bomb. It is proper and high time to implement law in letter and spirit without discrimination as life of human being is more precious. In fact, every one is not saved from attack of pollution. In this view of the matter, each and every citizen, public

functionary, authority and body must discharge its responsibility to reduce this problem at any rate at any costs.

JUDGMENT

"It is, therefore, respectfully prayed that a writ may kindly be issued restraining the respondents from setting up any industrial or other project over the land of the petitioners described in Annexure H and order of respondent No.1 contained in Annexure A may kindly be declared to be without lawful authority and of no legal effect."

2. Precisely stated the facts as narrated in the petition are that the then Metropolitan Corporation requested World Bank to finance an industrial project for production of energy out of municipal waste over the aforesaid land, including the petitioners, but the said request was declined by the World Bank, statedly, on the plea that the proposal would be hazardous to the environment. In the meantime aforementioned land was acquired, necessary notifications were issued by the competent authorities and award, dated 22-7-1997 was delivered, which action of acquisition of land, was, reportedly, challenged by the petitioners through filing Constitutional petition (W.P. No. 22157 of 1997) which is, statedly, pending. It is the case of the petitioners that they, on 12-5-1998, applied for the withdrawal of the notifications, but the said request was turned down, which necessitated the filing of the present petition on the additional grounds that with the promulgation of Pakistan Environmental Protection Act, 1997, no industrial project

can be established within the municipal limits and that the land of the petitioners is, still, being used for cultivating purposes. Needless to mention that Environment Protection Agency has also been impleaded in the present petition. Pursuant to the directions by this Court, the then Metropolitan Corporation filed the parawise comments and after the admission of the writ petition to regular hearing, written statement was submitted. The position taken by the Corporation was that the possession of the land had been taken over by Metropolitan Corporation on 22-7-1997; it has paid an amount of Rs. 1,52,96,610 to the. Collector as compensation of land and the compensation for trees etc. had also been deposited. It was further stated that the disputed land is being used by the. Corporation for dumping and disposal of solid waste and that the waste of energy project has nothing to do with the acquisition of land fill site: Environment Protection Agency also furnished parawise comments, which as per their own request, was treated as written statement, wherein it was stated that under section 12 of Pakistan Environmental Protection Act, 1997, a preponent of project is bound to submit environmental impact statement. During the proceedings, at the request of the learned counsel of the petitioners, which was not resisted by the opposing counsel, for the purpose of elucidating the matter in dispute. Mr. Ehsan Ullah Lilla, Advocate was appointed as local commission for spot inspection/local investigation who furnished his report, to which Metropolitan Corporation filed its objections. On one date of hearing of the case, Dr. Tufail Siddiqui, Incharge Solid Waste Management, City District Government also appeared and subsequently, on 9-9-2002, he filed a report of solid waste disposal in Lahore.

3. The learned counsel for the petitioners, while mainly relying on the report of the local commission, has vehemently submitted that it has, corroborated the findings of the survey conducted by Environment Department; that on account of the pollution, the people are subjected to various diseases; on account of deposit of waste, it is causing immense loss to the crops, animals and contemnation of sub-soil water and that the said filth depot is a public nuisance and injurious to health. On the other hand, the learned counsel, representing the City District Government, has submitted that no other suitable place is available for using as dumping ground for solid waste; the City District Government has requested the Health Department to use spray on the site in order to minimize the effects of the dumping station; that all efforts are being made to overcome the problem, presently faced by general public, particularly, the people of Mehmood Booti, but the Department is not in a position to shift the dumping ground from Mehmood Booti to other place. In this perspective, the learned counsel, representing the respondents prayed for the dismissal of the petition)

4. Notification, copy whereof has been filed as Annexure-D, shows that certain land in Mauza Mehmood Booti was acquired by the Collector, District Lahore for Lahore Metropolitan Corporation. The purposes of the acquisition, as given in the notification, is "for land-fill site (Waste of Energy Project)". Admittedly, the said project could not be established uptil now for one reason or the other, while the plea of the petitioners is that the World Bank refused to finance die said project. Be that as it may, the fact remains

that uptil now, the said project could not be established and this fact has been admitted by the City District Government. In this regard, it would be appropriate to reproduce certain portions of written statement. filed on behalf of erstwhile Matropolitan Corporation:

> *" .. It is submitted, that land fill site at Mehmood Booti is badly needed by MCL for dumping of solid waste because MCL does not have any other land fill site for this purpose, therefore, the acquisition of said land was planned keeping in view the need of land fill site for dumping of solid waste especially.*
>
> *Therefore, Waste to Energy Project has nothing to do with the acquisition of land fill site because MCL had purchased the land for the disposal of Solid Waste and not for the Waste to Energy Project especially."*

5. It flows from the above that the land, which was acquired for the purposes of land fill site (Waste to Energy Project), is being used, admittedly, by the City District Government for the purposes of dumping ground for Solid Waste and the acquired land is, prima facie, not being used for the purposes for which it was acquired. I have refrained myself from rendering findings on the crucial issue, as to what would be the legal :effect/consequences, if the acquired land is not used for the purposes for which it was acquired, as according to the petitioners, Constitutional petition (W.P. No.22157 of 1997) is pending on this crucial issue, lest these findings may prejudice the cause of any of the parties and additionally this issue is not involved in this petition.

6. To my mind,(the pivotal questions involved in this petition and require determination by this Court are as to whether the dumping of solid waste over the land and using it as dumping ground is creating multiple problems, causing diseases and pollution and is a series of nuisance for the inhabitants of the said locality and secondly, as to what relief in the above perspective, could be provided to the petitioners) in the present petition, if at all the same is to be treated as public interest litigation, as the relief claimed in the present petition is for restraining the respondents for setting up an industrial project for protection of energy out of waste. As noted above, the learned local commission was appointed who inspected the spot in the presence of the parties and submitted his report. It would be advantageous to reproduce certain portions of the report of the local commission, which are as under:---

"Para.2.... is full of dirt, filth and heaps of garbage and other dirty stinking material. This area comprises approximately 639 Kanals of land. There are piles of dirt, garbage, waste and putrifying filth lying. Fire are smoldering at many places in the massive heaps and generating fumes, smoke, bad odor, foul smell and intense heat. It was practically impossible to stay there.

Para-3. That blowing wind at that time was causing smoke, odor, smell and heat to travel in the direction of the dinse Abadi of village Mehmood Booti: Many people complied of the various diseases like pimples, skin allergies, Asthma and other lung affecting diseases because of the presence of flies and germs created by this

large quantity of garbage and refuse lying open and uncovered in the huge area. They also complained that the Crops and animals have also been affected adversely. The subsoil water has also been contaminated and the tubewell water and water from well is not safe to drink.....

Para.5. The existence of 'filth depots in its area is really a public nuisance and injurious to the health and sanitation of the people and locality.

Although objections to the report of the -local commission were submitted by City District Government., yet I find from the objections that the factual position prevailing at the spot as pasteurized and described by the local commission in his report, was not denied by the City District Government, meaning thereby that the said factual position is deemed to be admitted by them. However, it was pointed out in the objections that the land was purchased for the said purpose and no other suitable place is available for using as dumping ground for solid 'waste. It was also admitted in the said objections that although problems are being faced particularly by the people of Mehmood Booti, the City District Government is not in a position to remove the said dumping ground. The relevant positions of objections, filed by the City District Government, are reproduced below:---

"It is also worth mentioning that the District Officer Health/Epidemic. Control Officer (ECO) City District Government, Lahore, has been requested to use spray on the site to avoid generation of smokes, bad odor, foul smell, intense heat, flies and

mosquitoes including other insects etc. on interval days. Moreover, sprinkling of water is being arranged to reduce the environmental hazards as discussed in the report and levelling of land is being done by earth filling. Action is also been taken to remove stagnant water also.

3 to 6. it is also submitted that all efforts are being made to overcome the problems presently' being faced by the general public around the 'site and particularly the people of Mehmood Booti but this department is not in a Position to shift the dumping ground- from Mehmood Booti to other place due to limited resources. However, all the possible efforts are being made for upkeep of this dumping ground to give relief to the adjoining Abadies." (Underlining is mine).

It flows from the above that the report of the local' commission has in fact been admitted by the City District Government and instead of raising the objections to the said report, they, have shown their inability' to redress the grievance of the people of the locality.

7. I find from the record letter, dated 9-5-2002, by District Officer Environment Lahore, addressed to the District Officer, Solid Waste Management, wherein it was reported that pursuant to receipt of a complaint, a survey was conducted by Environment Department and it was found during the survey that the people are suffering from the problems like constant foul smell, abundance of flies/other insects/dogs and injurious smokes arising from the burning of waste etc.

8. As noted above, Dr. Tufail Ahmad, Incharge Solid Waste Management, City District Government, personally appeared before this Court and subsequently 'filed his report on 9-9-2002, which would be advantageous to be reproduced:—

"(1) That Land Fill Site, located at Mehmood Booti, Bund Road, is the piece of land, which has been purchased by the City District Government (Ex-Metropolitan Corporation, Lahore) and owned • by as municipal property from the years in the past.

(2) That with regard to resorting to urgent precautionary guarding measures and public grievance redressal, the dumping site waste flow is being covered by spreading earth layers over the waste. A dumper and a loader permanently has been placed there to operate for the said purpose.

(3) Executive District, Officer, Health, has been requested for deployment of special squads to be made duty bound to carry out periodic anti-fly spray and spray-dog killing operations on the Mehmood Booti Dumping Ground. (Copy enclosed.)

(4) That the City District Government has created and developed few private Landfill sites (dumping grounds) at three other locations in Lahore, namely:

(a) Babu Sabu Near Motorway Interchange, for transfer of solid waste from Ravi Town and Data Town Areas;

(b) Ittefaq Town, Ferozepur Road, for transfer of solid waste from Iqbal Town areas;

(c) Kamayan Ferozepur Road for transfer of solid waste from Gulberg and Nishter Town areas;

5. That due to development of these dumping grounds the pressures on Mehmood Booti seems to be released.

"It is further submitted to the Honourable Court that maintaining the dumping ground at Mehmood Booti is natural compulsion and the Solid Waste Management has to undergo this restraint and face embarrassment."

9. Above narrative amply demonstrates that the said area is being used by City District Government for dumping of solid waste. Both the parties appear to be in agreement that on account of dumping of solid waste, there are heaps of garbage and the area is full of dirt/dirty material. It has been established that due to heaps of garbage and other dirty material, there is bad odor, foul smell, countless flies, mosquitoes and other insects all over the locality. One can imagine that on account of the curative measures, statedly, taken by the City District Government, as narrated by the Incharge Solid Waste Management, fumes and pollution must be emitting all the time, causing diseases,

uncomfort and various other problems. Entire area must be polluted and the people living in that locality must be suffering from various serious diseases. Uptil now 'hundreds of peoples must have died in the said locality due to the various diseases caused by the dumping of solid waste, but most probably on account of ignorance, poverty or helplessness, nobody could come forward to highlight these muffled atrocities being "showered" by the public functionaries over the innocent citizens. One could imagine the state of life, being led and "enjoyed" by the people of locality and the enormous difficulties, in different shapes, being faced by them. Of course, they are the citizens of this country and are entitled to equal protection of law. The lives, being led by the people, living in that locality, must be miserable and it is the duty of the City District Government to redress the grievances of the citizens of this country living in' Lahore, moreso, when the fundamental rights have been guaranteed to the citizens under the Constitution, which, inter alia, provides that the dignity of man and subject to law, the privacy of home shall be inviolable.

10. Now coming to the second question as to what relief can be granted to the petitioners. It is a mater of common knowledge that the pollution creates dangerous gases etc. which are injurious not only to human life, but also to the lives of animals, birds and plants. This Court, while dealing with the problem of pollution, in deciding a Constitutional Petition titled Mrs. Anjum Irfan v. L.D.A. PLD 2002 Lah. 555 has held as under:-

"The problem of pollution is more dangerous as compared to destruction by Hydrogen Bomb. It is proper and high time to implement the law in letter and spirit without discrimination as the life of humanbeing is more precious. In fact, every one is not saved from the attack of pollution, in this view of the matter each and every citizen, public functionary, authority and body must discharge its responsibility, tp reduce this problem at any rate at any cost."

11. The apex Court of this country in the case reported as Ms. Shehla Zia and others v. WAPDA PLD 1994 SC 693 in a public interest litigation, considering the gravity of .the matter, which involve and affect the life and health of the citizens at large, issued notice to the concerned authority. It was further held in the said judgment that if "there were threats of serious damage, effective measures should be taken to control it and it should not be postponed merely on the ground that the Scientific Research and Studies were uncertain and not conclusive".

12. The Hon'ble Supreme Court of Pakistan in the aforenoted case of Ms. Shehla Zia, ibid, has held as under:---

"There is a state of uncertainty and in such a situation the authorities should observe the rules of prudence and precaution. The rule of prudence is to adopt such measure which may avert the so-called danger, if it occurs. The rule of precautionary policy is to first consider the welfare and safety of the human beings and the environment and then to pick up a policy and execute the plan

which is more suited to obviate the possible danger or make such alternate precautionary measures which may ensure safety. To stick to a particular plan on the basis of old studies or inconclusive research cannot be said to be a policy of prudence and precaution."....

"if there 'are threats of serious danger, effective measures should be taken to control it and it should not be postponed merely on the ground that scientific research and studies are uncertain and not conclusive. Prevention is better than cure. It is a cautious approach to advert a catastrophe at, the earliest stage."

It has further been held by the Honourable apex Court of this country in the aforenoted case of Ms. Shehla Zia as under:—

"Article 9 of the Constitution provides that no person shall be deprived of life or liberty save in accordance with law. The word 'life' is very significant as it covers all facts of human existence. The word 'life' has not been defined in the Constitution but it does not mean nor can be restricted only to the vegetative animal life or more existence from conception to death'. Life includes all such amenities and facilities which a person born .in a free country is entitled to enjoy with dignity, legally and constitutionally. A person is entitled to protection of law from being exposed to hazards of electromagnetic fields or any other such hazards which may be due to installation and construction of any grid, station, any factory, power station or such-like installations. Under the common law a

person whose right of assessment, property or health is adversely affected by any act of omission of a third person in the neighbourhood or at a far-off place, he is entitled to seek an injunction and also claim damages, but the Constitutional rights are higher than the legal rights conferred by law by it municipal law or the common law. Such danger as depicted the possibility of which cannot be excluded, is bound to affect a large number of people who may suffer from it unknowingly because of lack of awareness, information and education and also because such sufferance is silent and fatal and most of the people who would be residing near, under or at a dangerous distance of the grid station or such installation do not know that they are facing any risk or are likely to suffer by such risk. Therefore, Article 184, can be invoked because a large number of citizens throughout the country cannot make such representation and may not like to make it due to ignorance, poverty and disability. Only some conscientious citizens aware of their rights and the possibility of danger come forward."

"The word "life" in terms of Article 9 of the Constitution is so wide that the danger and encroachment complained of would impinge fundamental right of a citizen. In this .view of the matter, the petition under Article 184(3) of the Constitution of Islamic Republic of Pakistan, 1973 is maintainable."

"The word 'life' in the Constitution has not been used in a limited manner A wide meaning should be given to enable a man not only to sustain life but to enjoy it."

"Article 14 of the Constitution provides that the dignity of man and subject to law the privacy of home shall be inviolable. The fundamental right to preserve and protect the dignity of man under Article 14 is unparalleled and could be found only in few Constitutions of the World."

"Where life of citizens is degraded, the quality of life is adversely affected and health hazards are created affecting a large number of people the Court in exercise of its jurisdiction under Article 184(3) of the Constitution may grant relief to the extent of stopping the functioning of units whicll create pollution and environmental degradation."

13. To, my mind/pollution is form of slow poisoning, which the people living in the locality/area known as Mehmood Booti, are facing since long. Lives of 'tens of thousands 'of citizens of this country, some of them must be tax payer, are sinking in the ocean of dirt, solid waste, garbage and pollution and that too, at the hands of City District Government. It is high time that the public functionaries should realize H their duties and perform their functions, keeping in view the import of word "life" as defined by the apex Court of this country in Shehla Zia's case ibid. The instant petition is treated as public interest litigation and, thus, this Court is inclined to give suggestions/directions to the public functionaries, especially to City District Government.

14. In view of the above; it is suggested that now as the City District Government has taken over the affairs of erstwhile Lahore Metropolitan Corporation, therefore, City

District Government should make serious necessary endeavours for the redressal of grievances faced by the people of thickly populated locality of Mehmood Booti, should make alternative arrangements and to select suitable place for using as dumping ground , and dumping solid waste, keeping in view the provisions of Pakistan Environmental Protection Act, .1997, and the observations and suggestions, made by the superior Courts of this country in' Shehla Zia and Ms. Anjum Irfan cases, supra. This Court, while giving suggestions/directions, is not completely oblivious of the difficulties, being faced by the City District Government and is considerate enough to provide ample time to the City District 'Government to make serious efforts and arrangement for the removal of dumping ground for solid waste from the area of Mehmood Booti and to make alternative arrangements for dumping of solid waste far away from the residential areas, so that the lives of ten's of thousands of people and their future generation could be saved from the catastrophe of pollution, which exercise is to be completed within a period of one year. Till the necessary, arrangements are made by the authorities concerned, as suggested above, it is directed that the Lahore City District Government and Health Department shall deploy all possible resources at their disposal in that area to minimize the effects of the dumping ground.)

15. Writ petition stands disposed of with the above suggestions/directions with no order as to costs.

Against the judgment the city district government filed the appeal CITY DISTRICT GOVERNMENT LAHORE VS MUHAMMAD YOUSAF AND OTHERS before the division bench of Lahore High Court Lahore. The bench appointed Dr. Pervaiz Hassan as an ***amicus curiae.*** on the written suggestion of Dr. Hassan the bench on 25 February 2003 constituted a high powered committee to be headed by Dr. Hassan to examine the EIA etc. After detailed meetings the committee finalized its proposal, which was submitted in the court. Consequently on 13 January 2005 the divisional bench headed by the chief justice by agreeing with the proposal of committee in allowing the appeal of the CDG set aside the order of single judge.[9]

In re: HUMAN RIGHTS CASE (ENVIRONMENT

POLLUTION IN BALOCHISTAN)

Constitution of Pakistan (1973)---

----Arts.184(3) & 9---Public Interest Litigation---Environmental hazard pollution in Balochistan---Supreme Court, having noticed a news item daily newspaper that nuclear or industrial waste was to be dumped Balochistan which was violative of Art. 9 of the Constitution, ordered the office to enquire from Chief Secretary of Balochistan whether coastal land Balochistan or any area within the territorial waters of Pakistan had been or was being allotted to any person and if any allotment had been made or applicants had applied for allotment, their full particulars be supplied---Plots having been allotted by

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[9] (ICA-798 of 2002)

Balochistan Development Authority, Supreme Court ordered that no one will apply for allotment of plot for dumping, nuclear or industrial waste---Supreme Court further gave the guidelines for allotment of plots in the area.

In a news story published in the daily "Dawn" dated 3.7.1992 entitled to **nuclear waste to be dumped in Balochistan**. The Supreme Court took the Suo Moto notice of the news items regarding the dumping of nuclear waste in Balochsitan. In this regard the Chief Secretary of Balochistan was asked to enquire into the matter and report the court. Moreover, there was a news item in Dawn regarding the dumping of waste by the Associated Press of Pakistan reporter. The reporter of the agency was also asked to supply the particular of his report and the source of information as well.

ORDER

In compliance with the notice issued on 9th July 1992, the Chief Secretary had made inquiries from various Departments, namely, from the Commissioner of Makran, Commissioner of Kalat Division and also from the Board of Revenue who had submitted their reports which were forwarded to this Court. From the reports submitted, it seems that besides the land allotted to the Pakistan Navy and Maritime Agency for defence purposes, 112 ship-breaking plots measuring 336 acres in Gadani Beach, Lasbella District have been allotted to ship breakers for ship-breaking purposes by the Balochistan Development Authority. Furthermore, land measuring 29.2.2 acres has been allotted to one Muhammad Anwar son of Qadir Bukhsh for agriculture purposes. The Chief Secretary while giving details has stated that the allotment of land for ship-breaking was

made by the Balochistan Development Authority while the plot measuring 29.2.2 acres .was allotted by the Chief Minister on the recommendation of Balochistan Development Authority.

The officials present have reported that no plot has been allotted any party for dumping nuclear waste. The Commissioner, Makran Division has pointed out that the law enforcing agencies on the high seas are always on the alert and can locate any vessel from a distance of more than 500 miles.

It may be noted that no one will apply for allotment of land by dumping nuclear or industrial waste. This would be a clandestine act in the garb of a legal and proper business activity. The authorities are therefore not only to be vigilant in checking the vessels but regularly check that the plot allotted are not engaged in dumping industrial or nuclear waste of any nature on the land or in the sea or destroying it by any device.

It seems that the plots have been allotted by Balochistan Development Authority and all the relevant terms and conditions will be available with them. In these circumstances, the following interim order is passed:

(1) The Balochistan Development Authority should submit to the Assistant Registrar, Supreme Court, Karachi a list of persons to whom land on the coastal area of Balochistan have been allotted giving the name and full address alongwith copies of the letters of allotment lease or licence which may have been issued in their favour.

(2) The Government of Balochistan and the Balochistan Development Authority are directed that if any application for allotment of coasting land is pending or in future any party applies for allotment of such land then full particulars of such applicants shall be supplied to the Assistant Registrar, Supreme Court of Pakistan, Karachi before making any allotment to any such party.

(3) The Government functionaries, particularly the Authorities which charged with the duty to allot the land on coastal area should insert condition in the allotment letter/licence/lease that the allottee/tense shall not use the land for dumping, treating, burying or destroying any device waste of any nature including industrial or nuclear waste any form. The Balochistan Development Authority should also obtain similar undertaking from all the allottees to whom the allotment been made for ship-breaking, agriculture or any other purpose whatsoever.

Before parting with the order I record my appreciation for officials present who have shown their interest and keenness in tackling, problem. Such eagerness coupled with public awareness can eliminate much the problems creating health hazard to the citizens.

Case Law:

Messrs HABIB BANK LTD.---Appellant

versus

Dr. ZUBAIDA H. PEER MUHAMMAD--Respondent

(a) Sindh Rented Premises Ordinance (XVIII of 1979)---

----S.15(2)(v)---Word "nuisance" appearing in S.15(2)(v), Sindh Rented Premises Ordinance, 1979---Meaning and scope---Acts amounting to unwarranted interference

with the rights of neighbours or causing injury, damage, hurt, inconvenience annoyance or discomfort to another in the enjoyment of his right with respect to his person or property, or in another manner committing acts of gross misbehaviour with the persons who are in use and occupation of the premises in the immediate vicinity, besides creating an atmosphere of environmental pollution---Such instance may be treated as nuisance.

(b) Sindh Rented Premises Ordinance (XVII of 1979)—

----S. 15(2)(v)---Causing of nuisance by tenant---Landlord filed ejectment application against the tenant, on the allegation of causing nuisance to the other inmates of the premises---None of the other tenants of the building came forward to support the version of the appellant/landlord---Only solitary statement of the engineer of landlord was available on record in that respect---Such witness of the landlord visited the premises on one occasion and the same could at the best indicate that on the occasion the sweepers of the landlord (who were primarily responsible for cleaning the sewerage lines and preventing gutters from choking) failed to perform their duties properly---Rent Controller relying on such evidence refused the ejectment of the tenant---Validity---Landlord having failed to discharge the burden of proving all necessary facts which would establish the point of nuisance, Rent Controller was justified in drawing the conclusion that the landlord failed to prove the allegation of nuisance against the tenant.

JUDGMENT

This First Rent Appeal has been filed by the Appellants, Habib Bank Limited, against the judgment, passed by the learned VIII Rent Controller, Karachi South, whereby filed by the appellants was dismissed.

The facts of the case, in brief, are that the appellants are the owners of the building known as "Habib Bank Building" situated at-the corner of Abdullah Haroon Road and M.A. Jinnah Road. The appellants let out the entire second floor of the said building (hereinafter referred to as 'the renter premises) to the respondent. The respondent 'has been running a Clinic/Hospital in the rented-premises since last thirty years. The appellants filed a ejectment application under section 13 of the Sindh Urban Rent Restriction Ordinance, 1959 for eviction of the respondent on the ground of causing nuisance to the applicant and other occupants of the said building and for impairing the value and utility of the building.

The respondent was served with the notice of the rent case who filed her written statement wherein she admitted the relationship of landlord and tenant and the quantum of rent, excluding the betterment tax; however, she denied all the other allegations made in the rent case.

Although the rent application was filed under the Sindh Urban Rent Restriction Ordinance, 1959, but before the evidence could be recorded in the said case, Sindh Rented Premises Ordinance, 1979 was promulgated consequent thereupon the appellants'

witnesses filed their affidavits-in-evidence and they were cross-examined. Similarly, the'. respondent filed her affidavit-in-evidence and she was also cross-examined.

On the basis of the pleadings of the parties, the learned Rent Controller framed the following points for determination:

"(1) Whether opponent has created nuisance and has impaired the utility of the premises?

(2) What should the order be?"

The learned Rent Controller, after hearing the parties and going through the record/evidence, dismissed the rent application.

I have heard learned counsel for the parties and gone through the record and the case-law cited before me. It may be mentioned here that the respondent expired during the pendency of this appeal and her legal representatives were brought on record and the title of the memo of appeal was amended accordingly.

The learned counsel for the appellants contended that the respondent while running the clinic/hospital or the maternity home had not maintained hygienic conditions and the refuse and waste of the hospital was neither properly stored nor removed or disposed of, which besides causing unhealthy conditions and posing environmental problems, blocked the sewerage lines and also caused nuisance, annoyance and irritation

to the appellants and also to other inmates of the said building, therefore, the respondent is liable to be ejected on this ground.

The learned counsel for the appellants built the contention on the basis of that the clinic are the maternity home failed to meet the hygienic conditions of the premises and refused to dispose the waste material of the hospital. That resulted blockage of sewerage lines cause nuisance for the people of the area. The respondent built contention on the basis of Crescent Carriers v. Gulzar Ahmad & Brothers (1986 MLD 813) and Farid Hassan v. Muhammad Ayub (1986 MLD 371) and argued that the appellant had failed to furnish the proper evidence to establish the facts of nuisance. And the absence of any witness it cannot be assumed that the respondent caused any nuisance in the area. He supported his plea by giving the arguments with the reference of Syed Hussain Ali v. Ahmed Bux (1992 MLD 2000), Syed Ashraf Ali v. Ali Muhammad Khan (1986 CLC 735) and Mst. Hashmi Begum v. Mst. Alya Zohra Begum (1985 MLD 1514).

Admittedly, the term 'nuisance' has .not been defined in the Ordinance itself but on many occasions this term has been discussed and defined by the superior Courts in the light of various judgments, and treatises on the subject.

Incidentally, while fixing the responsibilities the Rent Controller included the issue whether the respondent had impaired the utility of the premises. This point

however, was not brought before the Rent Controller at the time of the arguments but this was not proved satisfactorily by the appellants. No further plea was taken in this regard. Consequently the learned rent controller dismissed the appeal.

Case Law from India:

B.L. Wadehara

Verses

The Union of India 1994

In India a complaint was lodged against municipality of Delhi in the Supreme Court regarding the disposal of waste in satisfactory manner. Supreme Court held in its decision that since the matter is of public importance thus it is essential that mass awareness campaigns, should be lunched. So that public should be saved from the infectious waste. Supreme Court issued shows cause notices to Delhi municipal commissioner and it was held that the other metropolitan cities should also follow the directions given by the Supreme Court.

CONCLUSIONS

The problem of solid waste that has become a most serious problem of the developed and under developing countries that curiously entangles industrial concerns farm houses and house activities in such a way that solution to the problem has become an enigma to the nations of the worlds. Various methods have been taken into practice to deal the situation but the problem is with many dimensions where each solution brings new problems. From house hold waste to the nuclear waste there are, many complications that need to be addressed very properly. The World Community is trying its level best to wriggle out of this problem. For this purpose regional nation groups (SAARC and ASEAN) and international community has reached at an understanding that our earth day by day is getting polluted. To save the earth from the toxic waste and dangerous pollutants does not fall the responsibility of one nation rather this is the responsibility of the whole world community i.e. why UNO is taking steps in this direction. Pakistan being a developing country has small resources at its disposal to deal with this menace. In case of Pakistan the problem is more of behaviour and less of institutional inadequacies. There are, lackings in institutional working makeup that are hurting the management mechanism. The problem needs detail management paraphernalia with comprehensive administrative setup to the address properly. It is regretted that is no laboratory system with proper analytical facilities to categories the municipal solid waste. It becomes hard nut to estimate the energy potential of the solid waste and its allied possible uses. Without

the availability of proper data it can only be guessed that this waste could be recycled, reutilized and processed for profitable ends. It is a dire need of hour that a laboratory with proper equipment and the experts should be established to categories the solid waste and efforts should be made to link up the whole system with modern research analysis and for this purpose both developed countries and developing countries experiences must be looked into. It is also interesting to mention that there is not a single sanitary fill sight in Pakistan to dispose of solid waste in environment friendly manner. Municipal waste is openly dumped without meeting the minimum environment consideration. The entire thrust of the thesis is to look into the problem mechanism its allied legal and constitutional developments and a study of developed and developing countries with a sense that the experience of developed countries should be benefited. Case laws and suggestions have been given to improve the situation steps have been envisaged to address the complexity of the problem. First meaningful step would be the public awareness coupled with the awareness of high authorities regarding their responsibilities to the gravity of situation that is intensifying with each passing day.

BARRIERS IN THE WAY OF DEVELOPMENT OF ENVIRONMENTAL LAW:

Lack of awareness among the people

In Pakistan literacy rate is 57 per cent. A sizable part of our population lives in urban areas. A rapid migration from rural to urban areas has seriously affected the urban areas. A huge influx in urban areas has aggravated the problem of civic facilities. People are not aware of the hazards of accumulated waste around them. Efforts on the par of govt. to make the people aware remained restricted to NGO organized walks in the fashionable areas of the big cities. Awareness of the public at large is needed. This is possible with the help of effective NGO's.

Lack of political will

The new district government system has concentrated power in the hands of District Nazim. Being a man easily approached by councilors and influential he dares not to take any radial steps against those who with vested interests hurt the interest of local populace.

Lack of funds

Environmental laws are enforced through police. The drive against the vehicles that create smoke nuisance results into nothing. Where policemen show their performance by issuing fine ticks to the road users? The govt. vehicles issuing

clouds of smoke made the fun of those who use private vehicles. Corruption is all ware and this issue needs to be addressed even handedly.

Corruption of Agencies and persons responsible for enforcement of laws relating to environment.

More than 30 percent population is living under the line of poverty. They are living a very hard life as they have to work in a situation inimical to health. The Government agencies responsible to check the health hazards seldom attend their duties. Recently a case of recycling of hospital waste has been reported in the news papers. No stern action was taken against the responsible. In some cases agencies close their eyes and another cases they received hush money to be ignorant the situation reported in the news papers are surfaced an account of some serious health accident.

Defective planning

There is seldom a public work that is done with planning. Different agencies seem at cross purposes. Had there been a systematic planning and effective check things might not took and ugly turn. The classical example is Masud Hospital Gulberg Lahore. Where a huge building was erected under the very nose of LDA officials. But later on it was demolished by the order of Supreme Court. The waste material was neither disposed of nor sufficiently covered. The result is the destruction of green belt and in convenience of the people around.

Absence of infrastructure

In Pakistan Govt. definitely taking some affect measure to deal the problem of solid waste pollution but the infrastructure is yet to be built for its effective

management. The Government offices have neither data nor the available machinery to deal the solid waste. Schemes are mostly on papers and where they are in operation the work is slow and a burden on the state exchequer. It is a high time to deal this problem on war footings. In the case of any negligence a delay it will produce myriad of problem for the future generation.

Absence of competent NGO's

Non Government organizations throughout the world have been actively participating in solid waste management. In case of Pakistan there is no proper participation of the private enterprises and NGOs to deal the problem. It is dire needs of hour that private concern and competent NGOs should invite to participate in this venture.

Non professional attitude of environmentalists[2]

It is sad to say that professionals do not attend their responsibilities as required by the situation. They are lacking innovation and motivation in most of the cases files move from one government office another government office and seldom are a responsibility fixed for the individual to assume the responsibility of particular enterprise. This apathy of the situation is causing colossal lost to the individual and properties. An effective management is the solution to this problem.

SUGGESTIONS AND RECOMMENDATIONS

1. The already available laws for the environmental protection should be enforced with letter and spirits. It is also important that in the even situation the steps should be taken to address the problems with pragmatic thinking and practical approach. For this purpose it is essential that the Federal and Provincial Agencies should take into function. The programme live with them and its monitoring should be made effective.

2. Separate Environmental Magistrate should be appointed, having no other responsibilities except to hear the environment cases.

3. Environment Tribunal must be established in each province and at federal capital.

4. Chairman and members of the tribunal must be appointed on merit instead of giving job to a retired judge or bureaucrat in reward of service rendered by them to the present government.

5. Special courses should be conducted on regular bases to impart environment education and knowledge to the judicial officers, judges, prosecution, government officials concerned with environment and environmental lawyers.

6. Environment law must be made compulsory subject in legal education.

7. Law prescribing special procedure of evidence in environmental cases should be promulgated.

8. Appointment in environment department, should be on permanent basis instead of contract.

9. It should be confirmed, that appointees have sufficient knowledge about environment and existing laws about the concerned subject.

10. Federal and provincial governments have adopted a hands-off policy declaring it local problem rather than national one, as a result the load on municipalities to manage solid waste is greater their meager resources.

11. The garbage should be used for the production of power generation as China, Argentina and Brazil had already adopted this method. Pakistan being a country suffering acute shortage of electricity desperately searching means to meet the growing deficit of the demand and supply of the electricity. Almost four thousand mega watt shortfall has recently been recorded. Garbage can be utilize to meet this shortfall and the experience of China and Brazil could be utilize for the benefit of the nation.

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