

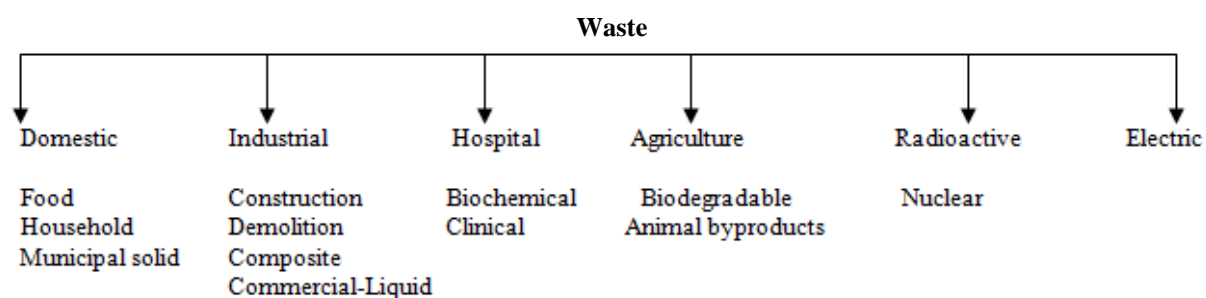
Water Waste Minimization System

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I. Introduction

A rising life standard, changing life style food habits, high rate of resources consumption pattern & population growth have put unintended negative impact on the quality of urban environment. Our cities are gripping with problems of high volume of waste, cost involved, disposal techniques & methods for beyond the handling capacities of urban government. In India annual per capita increase in waste generated is estimated as 1.1.33%. By the year 2047, this would approximately 260 million tons that would need more than 1400 Sq. Km of land in our country. The disposal of this waste is becoming a global problem. Waste could be generally defined as that which is not required.



Water Waste is water that has been adversely affected in quality by anthro progressive influence. Waste water is a combination of the liquid or water carried wastes, removed from domestic institutions, commercial & industrial establishments together with surface/ground/storm water.

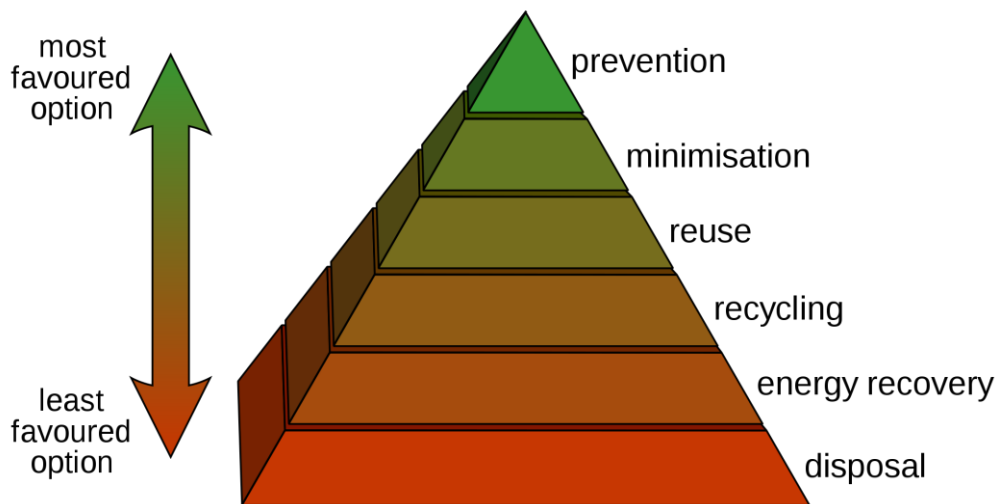
1. Municipal wastewater-Human excreta, solid waste, storm water.
2. Sewage-Domestic waste water, urine, toilets.
3. Seawater-Ingress high volume of scadt & microbes
4. Highway drainage
5. Storm drain-(car, shopping, trolley, tress, cattle etc)
6. Black water-(counters feces, urine, flush water from hush toilets)
7. Industrial site drainage-sill, sand, alkali, oil, chemical, residue, toxic waste, solid & emulsion.
8. Agriculture drainage
9. Hydraulic factories produced water from oil & natural gas production
10. Washing water rainfall collected
11. Urban rainfall run off from road, car parking roof

II. Waste Minimization

Waste minimization is a process of elimination that involves reducing the amount of waste produced in society and helps eliminate the generation of harmful and persistent wastes supporting the efforts to promote a more sustainable society.

III. Waste Minimization Involve

1. Redesigning product or changing society pattern, reducing waste generation to prevent the creation of waste.
2. Waste management strategies.
3. Waste Hierarchy



IV. 4. Definition of Minimization

4.1 Waste minimization-refers to strategies the aiming to prevent waste at source.

4.2 On the production side-focusing on optimizing resources & energy use and lowering toxicity level during manufacture.

4.3 On the consumption side-to strengthen awareness and prompt environmentally conscious consumption pattern and consumer responsibilities to reduce over all level of waste generation.

4.4 Calculating waste water volume

Waste water type	Waste water source	L/Person
Black water	Toilet	20
Gray Water	Shower	63
	Hand-wash	06
	Washing machine	13
	Laundry taps	12
Other waste	Kitchen waste	12

4.5 Constitute of Waste Water

Suspended solid, biodegradable, organic, nutrients-(Nitrogen, Phosphorus, Nitrogen & Phosphorus pathogens) colloidal & dissolved solids, volatile organic compound, odors, metals etc.

4.6 Reuse/Recycle of Waste Water

Waste Water Treatment

Contaminants	Treatment System
Suspended Solids	Sedimentation Screening and comminution Filtration variations Flotation Chemical/Polymer addition Coagulation/Sedimentation Land treatment systems
Biodegradable organics	Activated-sludge variations Fixed film-tricking filters Fixed film-rotating biological contractors

	Lagoon variations Intermittent sand filtration Land treatment systems Physical-chemical systems
Pathogens	Chlorination Hypo-chlorination Ozonation Land treatment systems
Nutrients Nitrogen	Suspended growth nitrification and denitrification variations Fixed film nitrification and denitrification variations Ammonia stripping Ion exchange Break points chlorination Land treatment systems
Phosphorus	Metal-salt addition Lime coagulation/sedimentation Biological chemical phosphorus removal Land treatment systems
Refractory Organics	Carbon adsorption Tertiary Ozonation Land treatment systems
Heavy Metals	Chemical precipitation Ion exchange Land treatment systems
Dissolved Inorganic Solids	Ion exchange Reverse osmosis Electro dialysis

Sludge Processing and Disposal methods

Processing Disposal Function	Treatment Method
Preliminary operations	Sludge pumping and grinding Sludge blending and storage
Thickening	Gravity thickening Flotation thickening Centrifugation Classification
Stabilization	Chlorine oxidation Lime stabilization Anaerobic digestion Pure oxygen aerobic digestion Heat treatment
Disinfection	Disinfection
Conditioning	Chemical Conditioning Elutriation
Dewatering	Centrifuge Vacuum filter Pressure filter Horizontal-belt filter Drying bed Lagoon
Drying	Dryer
Composting	Composting
Thermal reduction	Multiple health incineration Fluidized-bed incineration

	Flash combustion Co-incineration Co-pyrolysis Pyrolysis Recalcination
Ultimate Disposal	Landfill Land Applications

Methods of removing the contaminants from waste water

- **Physical unit operations**
- **Chemical unit operations**

Screening, Comminution, Flow Equalization, Mixing, Flocculation, Sedimentation, Flotation, Filtration, Micro screening, Chemical precipitation, Gas transfer, Adsorption, Disinfection with chlorine, Disinfection, De-chlorination, Disinfection with ozone, Racks and coarse screens, Comminutors and grinders, Grit chambers, Flow Equalization, Skimming, Flocculation, Pre-aeration, Sedimentation, Flotation, Fine screening, Imhoff and septic tanks, Chemical precipitation, Granular-medium filtration, Chlorination, Odor Control.

- **Biological unit processes**

Asia’s future demands will rise in respect drinking water needs in urban areas. Recycling is crucial- More & more; the recycle water will be required to be well utilized for uses other than drinking like.

1. Washing surfaces, flushing, gardening
2. First charge on fresh water for drinking & cooking.
3. Industry to recycle & reduce demand on fresh water.
4. Return flows to be treated for agriculture use also.

Waste Minimization Work Plan Activities

1. Mapping of international and national organization & their efforts
2. Awareness raising booklet of best practices
3. Guidelines for professional on household & commercial waste including package.
4. Capacity building of technical assistance at regional, national & local level by training & guideline.

Work Plan

1. **Governments**-Right policy frame work & legislation reduces work generation.
2. **Industries**-Integrated Re-decoupling in production strategies.
3. **Designers & productions**-New products, dematerialization, live cycle management, eco design.
4. **Retailers & entrepreneurs**-to assess to “sustainable” products service system, distribution system.
5. **Consumers**-Making better choice, recycling scheme, shifting of product
6. **Scavengers & waste pickers**-Increase worker & better salaries