

An Environmental Study on Solid Waste Management in Valsad City

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Abstract- According to today's scenario solid waste is the major problem in cities, not even cities only but the small town has also the giant consumption of different life routine things and that's why the solid waste increases day by day very rapidly. And behind that the life style is playing major role in it, so now days the governments are facing the problem of storage, dumping and release process of solid waste. The study shows that there is a significant link between the improper management of urban solid wastes and environmental pollution. In order to achieve the goals and to evaluate the environmental aspects around the ultimate disposal sites of solid wastes the current amount of waste generation and the nature of the solid waste management system of the city has been analyzed. Finally, the project suggests some measures for taking necessary steps to keep the valsad city nice and healthy.

KeyWords: contamination, environment, disposal, municipal solid waste management

I. INTRODUCTION

Solid waste is the unwanted or useless solid materials generated from combined residential, industrial and commercial activities. Solid wastes are all the discarded solid materials from municipal, industrial, and agricultural activities. Rapid industrialization and population explosion in India has led to the migration of people from villages to cities, which generate thousands of tons of MSW (municipal solid waste) daily. Generally, MSW is disposed of in low-lying areas without taking any precautions or operational controls. Therefore MSWM is one of the major environmental problems of Indian megacities. Solid waste management is polite term for garbage management. Poor solid waste management will result in an unpleasant and often unsafe environmental

II. STUDY AREA

Valsad is Britishers called it Bulsar. This city has a collectorate, a district court, and is a municipality in the Valsad district of the Indian state of Gujarat. Valsad is a town inhabited by Gujarati people. Gujarati is the primary language in and around the town. Valsad is located at 20.63°N 72.93°E. It has an average elevation of 13 meters (42 feet). The city center is about 4 km inland from the Arabian Sea. Valsad City is selected as the study area for this research.



Fig 1: Study area of Valsad

Objectives of the study

- ✚ To view the types and current amount of wastes generated in the city.
- ✚ To study the present situation of solid waste management.
- ✚ To evaluate the environmental aspects around the ultimate disposal sites of solid wastes of the city and suggests for taking necessary measures to safeguard the environment.

III. METHODOLOGY

The methods used for this study are a combination of observation by transect walk in the study area, case studies and questionnaire survey. The study conducted from august 2015 to march 2015. Data were collected in and around different dumping sites of the study area along with other sources of waste generation. Observation was done by transect walk in the study area to observe the sources of wastes, types of wastes and dumping sites of wastes and necessary notes were taken in the note book. Photographs were taken during the observation. Relevant data for this research were collected directly from the field by using a questionnaire which contained structured and open to end questions. The sample size was 60 households for the questionnaire survey.

The methodology adopted for the present study also make extensive use of secondary material and laboratory analysis to build up and support the objectives of the study and to corroborate the findings that give an account of current amount of wastes generated by the inhabitants of the city and collection and efficiencies of valsad authority.

PRIMARY COLLECTION

Normally the households bring their refuse to the nearby communal bins/containers located on the street side, while in some specific are as the community has arranged house to house collection of garbage with their own initiatives and efforts. The household, commercial, institutional and medical wastes are deposited in the same waste collection bins located on the streets. Street sweeping is done manually and debris is loaded from the curb-side into the hand carts and delivered to the collection bins. Sweepers/cleaners sweep the roads and clean the drains and then place those wastes in the nearby dustbins or containers using a hand cart.

However, most of the domestic, commercial & industrial solid wastes are still being accumulated in the dustbins/containers by the concerned household owners themselves.

Transportation

Every vehicle has got specified areas and route through which they move to collect wastes. The number of solid waste transporting vehicles available and their capacity is seen in Table 1.

Table I. Number of transporting vehicles.

Vehicles	Capacity	Number
Garbage truck	1.5-3 tons	7
Tractor	100 kg	11
Trolley	25 kg	6

MSW generation

Generation of the MSW has an obvious relation to the population of the city, caused by bigger cities generate more waste. Valsad generates the largest amount of MSW. In municipal environmental management, composition of waste is very important to be able to forecast the amount of solid wastes generated. This information is needed not only to formulate environmental standards and assess environmental impacts of the wastes, but also to evaluate the potential quantity of re-useable energy and material resource in wastes.

Accurate records of quantities of solid waste generated and collected are of critical importance in selecting specific equipment and in designing waste collection routes, materials recovery facilities and disposal facilities. Also they can be used for budget preparation and operation optimization.

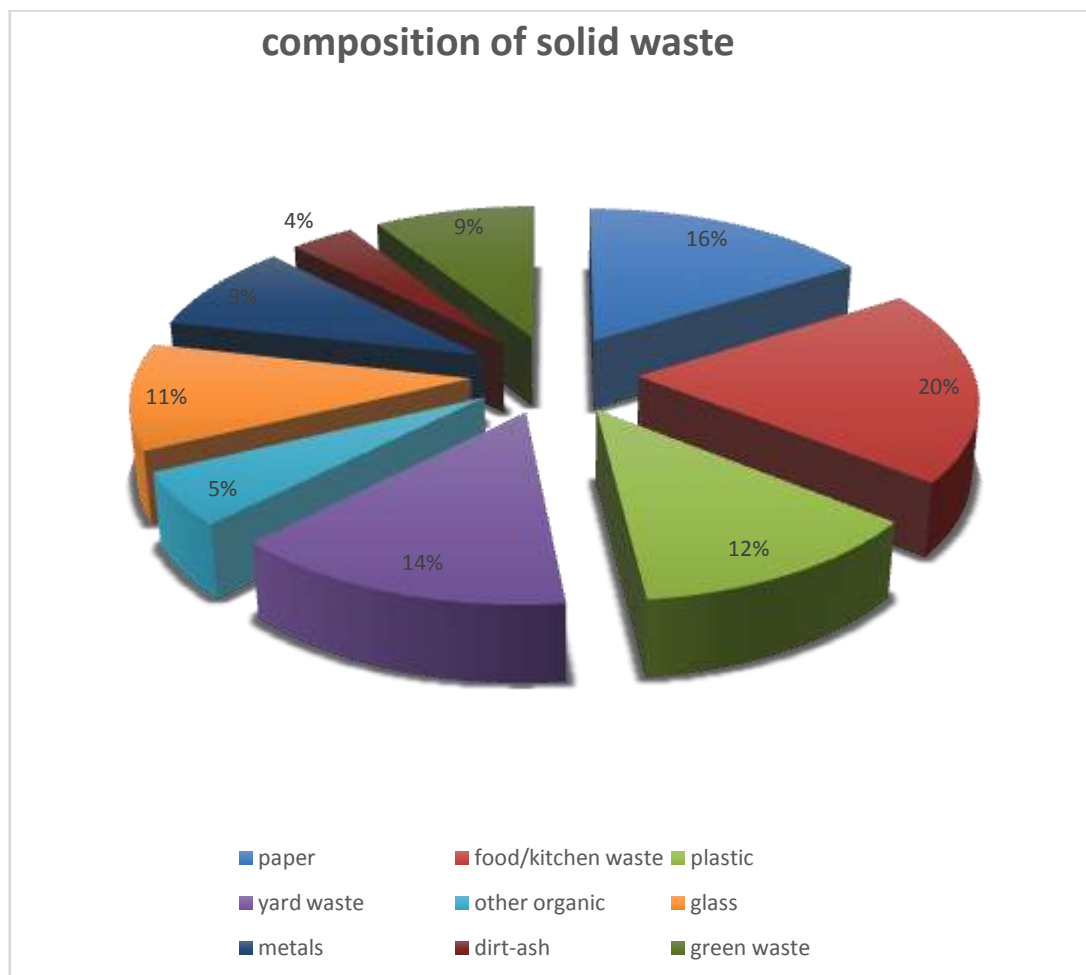


Fig 2: Composition of Solid Waste

IV. DATA COLLECTION

The survey was conducted to identify which types of waste was generated, how to dispose those types of waste, sources of wastes etc. A total of 60 households, 10 industries, and 20 shops were interviewed using the some Questionnaire which was randomly administered among the different households.

The results indicated that majority of the residents are very much concerned about the poor current state of the environment due to improper and inappropriate SWM in valsad township. Very few of the residents knew little about recycling and composting. The residents are clearly dissatisfied with the services of the Environmental Health Protection Authorities with regard to SWM in valsad.

V. RESULTS AND DISCUSSION

Surface water contamination

Surface water is also contaminated because solid wastes are dumped near the pond, canals and the river aurnga is used for fishing purposes and even sometimes by households. Contaminated water is harmful for fish and aquatic life and has the possibility of different diseases by reducing the amount of oxygen in the water. Chemical and oil spills also cause serious water pollution that kills water floral faunal species and other wildlife. In the entire studied ultimate disposal sites (UDS), there is no control of waste contents. As a result several types of hazardous wastes are also disposed in the main stream of the river aurnga and the canals of the city. The study finds that the release of toxic components such as Total Dissolved Solids (TDS), Electric Conductivity (EC) etc. From dumping sites are mainly responsible for the contamination of pond, canal and river water bodies adjacent to the mentioned dumping sites. It is noted here that the values occurred for some physico chemical parameters such as Dissolved Oxygen (DO), pH, Biochemical Oxygen Demand (BOD), Chloride by laboratory analysis for the stations of surface water bodies are not fit with the standard values set by the test results.

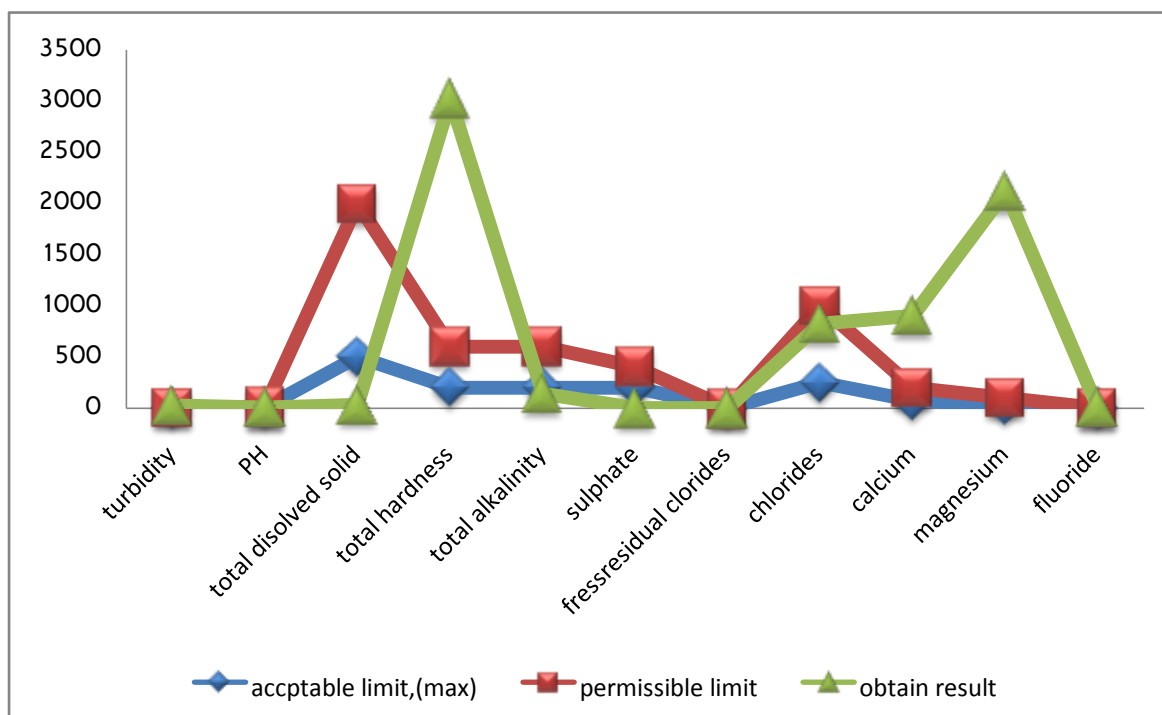


Fig 3: Comparison between obtain results versus WHO guidelines

Air pollution

Air pollution occurs due to the presence of undesirable solid or gaseous particles in the air in quantities that are harmful to human health and the environment. Pollutants that are emitted directly from identifiable sources are produced both by natural events (for example, dust storms and volcanic eruptions) and human activities (emission from vehicles, industries, etc.). These are called primary pollutants. There are five primary pollutants that together contribute about 90 percent of the global air pollution. These are carbon oxides (CO and CO₂), nitrogen oxides, sulfur oxides, volatile organic compounds (mostly hydrocarbons) and suspended particulate matter.

Soil contamination

The waste dumped at this site includes domestic waste, e.g. kitchen waste; paper, plastic, glass, cardboard, cloths. Construction and demolition waste consisting of sand, bricks and concrete block are also dumped. Further waste from the poultry market, fish market, slaughterhouse, dairy farm and non-infectious hospital waste is also dumped. The site is a non-engineered low lying open dump, a huge heap of waste up to a height of 5-6 m. The waste is dumped irregularly without segregation, except the rag pickers who rummage through the garbage and help in segregating it.

Noise pollution

Noise pollution is occurring due to waste spreading operations using equipment, collection vehicles and compactors. Noise causes discomfort and hearing loss in human beings and other animals. The noise pollution status is moderate in the existing disposal site, since the use of operation vehicles is very limited.

Odour pollution

Odour can be defined as the "perception of the smell" or in scientific terms as "a sensation resulting from the reception of stimulus by the olfactory sensory system". Whether pleasant or unpleasant, odour is induced by inhaling air-borne volatile organics or inorganic.

Suggestive measure

The findings of the study suggest some measures to efficiently manage the solid wastes and to take necessary steps for environmental degradation such as surface and ground water contamination, air pollution, noise pollution and odor due to inefficient management of solid waste of the city. It needs to maintain a scientific and engineering approach by the city authority for solid wastes management. Scientific and efficient collection practices, efficient management of landfill and sufficient manpower and funds are vital for this. The municipal authority should strictly maintain dumping grounds. To prevent surface and ground water pollution it needs to separate the collected wastes into hazardous and non-hazardous materials. The appropriate solid waste disposal method has to be selected, keeping in view that it should be economically viable, should not create a health hazard, should not cause adverse environmental effects, and should not result in unpleasant sight, odor, and noise. In order to prevent landfill leachate pollution of groundwater, the landfill must be

impermeable to take effective measures to end. It needs to strengthen legislation, strengthen management, minimize or control the use of non-degradable plastics for daily use. Overall, the public awareness is vital for solid wastes management of the city.

VI. CONCLUSION

The finding of the study suggest some measures to efficiently manage the solid waste and to take necessary steps for environmental degradation such as surface and ground water contamination, air pollution, noise pollution due to inefficient management of valsad city. Open dumping of solid waste affect the surrounding area of the dumping site, produces very bad odor and various types of pollutions likewise air, land, noise etc.

It needs to maintain scientific and efficient collection practice, management of landfill and sufficient manpower. The municipal authority strictly maintain dumping grounds to prevents surface and ground water pollution it need to separate collected waste into hazardous and nonhazardous material.

This study gives information regarding to various test results for taken water sample and give us the clear idea about water pollution at the Auranga River. Also suggestive measures are given for various types of pollutions likewise air, water, land, noise etc.

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