Solid Waste Management in Small Village: A Case Study

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Abstract
Managing solid waste is one of the most significant challenges of the rural areas of all sizes, from the small towns and complete area villages, which are home to the mass of humanity. It is close to always in the top five of the most challenging problems for village officers. It is somewhat strange that it accepts so little recognition compared to other rural management problems. Available data show that villages spend a substantial proportion of their available repeated budget on solid waste management. This method of insertion in solid waste management demonstrates how striking results can be achieved where the connection of the informal sector is stimulated.
Keywords: Solid waste management, Economic sectors, Kalayapuram town, Solid waste, Solid pollution.

Introduction

Solid waste management versions for the highest proportion of all types of wastes. Management of increasing solid waste becomes critical for almost all the major cities in India. Fast population growth, industrial growth, and solid waste disposal have led to the severe problem of waste management before civic consultants of cities. Solid waste management is an essential part of urban and environmental management of each city, with more than 65 percent of India's 250 million population living in class one towns [population over one lakh] and 23 cities getting peculiarity of being cities (population over one million). Solid waste management was never taken up significantly, either by the public or by concerned agencies or authorities. Now the piled up waste is aggressive our health, environment, and well-being [Stephens. (1983)]. This study emphasizes solid waste generation by different economic sectors of small-town via kalayapuram.

Groups of Waste

The duty of solid waste management remains primarily with municipal bodies: several other stakeholder groups also play substantial roles in solid waste management. It is widely recognized that wastes can be effectively grouped according to the origin, properties, legal descriptions, health risk, and frontiers. There is no need to describe the groups because they are self-explanatory.

Table 1: Groups of Wastes

Origin of solid waste	Forms of solid wastes
Agriculture waste	Liquid gels
Household or municipal	Wastes solid
Clinical or biomedical wastes	Gaseous
Industrial wastes	Slurries
Radio-active waste	Powder
Properties of solid waste	**Legal definitions of solid waste**
Toxic inflammable	Household
Hazardous carcinogenic	Industrial
Tactile volatile	Controlled
Acidic	Directive
Alkaline	Hazardous
Inert	Special
Health risk solid wastes	
Infections	
Inflammable or explosive	
Hazardous chemicals	
Radioactive chemicals	

Source: Author's primary data collection

Objectives of the Study

- To find out the sources of the waste generated in different economic sectors of kalayapuram.
- To estimate the volume of waste generated in the study area.
- To find out the issues, if any, in the solid waste management process and suggest suitable and scientific mechanisms in dealing the solid waste.

Solid Waste: Indian Scenario

It is a well-known thing that there is a close relationship between GNP per capita and per capita waste generation. Since the solid waste quantities are directly proportionate to the quantity of material consumed, the increase in per capita solid waste quantities would be openly proportional to the per capita increase in GNP. This is statistically shown in table 2.

Due importance has not been given to the subject of solid waste management in India. On account of the low priority given, solid waste management practices have continued to remain inefficient and out-dated.

Table 2: Relations between GNP and Expected Generation of Municipal Solid Waste

Year	1995		2025	
Economies	**GNP per capita [US $]**	**Urban waste generation [kg/per capita/day]**	**GNP per capita [US $]**	**Urban waste generation [kg/per capita/day]**
Low income	490	0.64	1,050	0.6-1.0
Middle income	1,410	0.73	3,390	0.8-1.5
High income	30,990	1.64	41,140	1.1-4.5

Source: Govt. of India: Manual on Municipal Solid Waste Management, Ministry of Urban Development, May 2000.

Lack of National policy, lack of interest by the State government, the inability of the local bodies to provide efficient services, lack of awareness and apathy of the community towards solid waste management, lack of involvement of NGO`s and use of inappropriate technology for collection of transportation and disposal of waste, institutional weakness, lack of trained workforce, lack of legislative support and ineffective implementation of laws and regulations are responsible for ineffective SWM services in the country [Asnani,1996].

The magnitude of garbage in Indian cities is enhancing. Indian cities and towns are estimated to generate about 80,000 metric tonnes of solid waste every day. Per capita, solid waste generated is about 350-400gms, and in large cities, it exceeds 500 gms [Lewtas. 1992]. Only 60 percent of this volume is collected, even less is transported and disposed of. Sanitary landfill or composting as a tool of garbage dumping is limited to one or two cities. Mumbai creates about 3200 tonnes of garbage, of which about 97 percent is together [Chandrappa et al., 2012]. Most solid waste that is collected end up in open dumps, sanitary landfill, or drainage system, threatening both surface water and groundwater features [Khopkar, S.M. 2007]. Solid waste creates one of the most visible environmental problems in low-income areas. These problems are directly linked to inadequate planning, finances, and management capacity at the local level [Sivaramakrishnan].

Methodology

The study is analytical and empirical. Based on the primary and secondary data, .the primary data have been collected from different economic sectors, which create solid waste for which distinct interview schedules were prepared and pre-tested. The per –tested interview schedule is used for collecting data and facts from different economic sectors, viz. Households, hospitals, markets, marriage halls, schools, hotels, bakeries, tailoring shops, printing press, sawmills, medical stores, medical labs, etc.

Solid Waste - Different Views

The following are the different views expressed by the various experts who done different research studies on management of wastes in diverse periods.

- The rapid growth of population, industrialization, urbanization, commercialization, and consumerism has led to the migration of people from rural to industrial cities, causing the addition of solid wastes. [Singh and Singh, 1998]
- The gathering and improper disposal of wastes lead to environmental pollution and accelerates the spread of communicable diseases [Bhat Sairam, 2002]
- Organic wastes can either be recycled as animal feed or be quickly disposal –off in village dumps, which do not require a substantial amount of public intervention .non –organic wastes can be either burnt or dumped and buried again without the need for public intervention or environmental damage [Johannes, 1981]
- Composing municipal solid wastes results in the recycling of the wastes and also generated compost, which can be used as manure [Alone And Bhide, 2002].
- Vermiculture technology can be used effectively for composting urban wastes, and thus, the disposal problems of urban wastes can be controlled effectively [Jeevan Rao, 2002].
- Need for organizing workshops, roadshows, campaigns to create awareness about solid waste handling [Sheeba, 2002].

Profile of the Study Area

The area selected for this study is Kalayapuram. Kalayapuram is a small Village/hamlet in Vettikkavala Block in Kollam District of Kerala State, India. It comes under Kulakkada Panchayath. It belongs to South Kerala Division. It is located 30 KM near East from District head quarters Kollam. 6 KM from Vettikkavala. 77 KM from State capital Thiruvananthapuram. Neduvathur (6 KM), Pattazhi Vadakkekara (7 KM), Kottarakkara (8 KM), Kunnathur (9 KM), Thalavoor (9 KM) are the nearby Villages to Kalayapuram. Kalayapuram is surrounded by Kottarakkara Block towards South, Pathanapuram Block towards East, Parakode Block towards North, Chittumala Block towards West. It consists of 16 wards with 6500 households. It possesses sufficient-economic, infrastructural amenities like educational, entertainment, &commercial centers, communication, hospitals, govt. offices, etc.

Micro-Level Evidence

The study has identified various wastes generating sectors in Kalayapuram village. Major wastes generating sectors are carefully analyzed and assessed the number of wastes generated by each sector in the study area. Presented in the table and diagram, which are self-explanatory.

Table 3: Annual Generation of Wastes from Different Economic Sectors in Kalayapuram

Wastes Generating Economic Sectors	No. of Respondents	Total Wastes (in tonnes)	%
Households	19510	6828.5	84.4
Hospitals	7	704	8.7
Markets	16	140.6	1.74
Marriage halls	6	54.6	0.67
Hotels / tea shops	35	14.0	0.17
sawmills	2	200	2.47
Schools (with pre-primary)	7	140	1.73
Tailoring shops	14	3.6	0.04
Printing press	2	2.0	0.024
Total	164	8087.3	100

Source: computed from the primary data

Note: *Wastes generated from households have estimated, based on a sample of 75 households were contacted by the researchers through a pre-tested interview schedule.

Major Findings

- The quantity of wastes generated in the study area is 8087.3 tonnes per annum. Of which ,household sector generates 84.4 per cent of wastes following by hospitals [8.7 percent], markets [1.74], marriage halls [.67 percent], sawmills [2.47 percent], schools [1.73 percent], tailoring shops [0.04 percent] and printing press [0.024 percent].
- Proper scientific mechanisms are not available in disposing of the wastes generated by the different economic sectors in the study area; and
- People in general and economic sectors in certain never bother about the neighborhood environment.

Suggestions

The significant suggestions that emerged out of this study are:

- We are creating awareness among the public about the effective utilization of wastes.
- We are informing the people about the conversion of wastes into wealth.
- We are providing minimal infrastructure facilities for collecting wastes from different economic sectors.
- Imposing a tax on the public, especially waste generating sectors, for effective management of wastes.
- Providing incentives for those sectors which adopt better and effective handling of wastes'
- Honoring the households who keep the surrounds of the house is neat and clean.
- Waste tax can be imposed by the local government in different economic sectors.
- Hospitals should have two separate sets of arrangements for storage of hospital waste – one for bio-medical waste and the other for the ordinary municipal waste.
- Establish an institution of waste management at the national level to monitor the rural area.
- Markets and hotels create a vast quantity of organic waste. This waste is ideal for composting. Such waste should be deposited directly in massive vessels, which should be taken to the compost plant or disposal site; and
- Large public waste storage bins for commercial zones and residential areas as an alternative to public bins.

Conclusion

Management of wastes is a significant problem faced by local governments like panchayats, municipalities, and corporations .each. Every day, large quantities of wastes are being generated by the different economic sectors. These wastes could be effectively managed and, in some cases, effectively conserved. Effective managing and preservation of wastes usually conserve the natural as well as environmental incomes. Further, conservation the natural resources and effective management of wastes can reduce the problems of pollution and thus save man and nature. The natural environment can be protected by adopting appropriate wastes management policies, which should be effectively implemented by the authorities. The success of waste management schemes and programs depends upon the co-ordination of the different government pieces of machinery with the support of influential people`s participation.

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