A Survey of household Solid waste Management in Chennai

(A case study of residents around kodungaiyur,Chennai,Tamilnadu)

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Abstract

Today scenario improper solid waste management causes pollution and health risk, which is main concerning environmental management in developing countries. In most cities, the use of open dumps is common for the disposal of wastes, resulting in soil and water resource contamination. The research paper surveys the current household Solid Waste Management (SWM) with reference of residents around kodungaiyur, chennai and the data formation done through questionnaire format of different household waste generators. Total 200 households were interviewed and the results of the data collection were interpreted with the help of SPSS. The survey indicated that majority of the residents are very much concerned about the poor condition of the environment due to the inappropriate and improper SWM in Chennai Corporation. Very few of the localities having knowledge about reuse, reprocess, and compost. The residents are not much satisfied with the service of the corporation in regard with SWM. This paper suggests some local effective SWM strategies.

Key Words: **Solid Waste Management, Environment Management, Reuse, Reprocess and composting, household waste.**

JEL classification: I35, P12, Q23, R18

Introduction

Waste can be classified based on its contents, including such material as paper, metal, plastic, and organic and inorganic waste; based on its hazard potential, including categories such as radioactive, flammable, infectious, toxic or non-toxic; based on its origin, characterized as industrial, domestic, commercial, institutional or construction and demolition.Whatever the origin, content or hazard potential is, solid waste must be managed systemically to ensure environmental best practices. As solid waste management is a very important aspect of environmental hygiene, it

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needs to be incorporated with our environmental planning.Goal of the 8 Millennium Development Goal is to 'ensure environmental sustainability' (**UNESCO, 2011).** A very central area that is critical in realizing this ambition is that of need to develop and implement effective strategies of solid waste. management (SWM) and more especially in densely populated urban areas. The main important task of SWM is to provide hygienic, efficient and economic collection, transportation, treatment and/ or disposal of wastes, without polluting the atmosphere, soil or water resources. In most cities, the use of open dumps is common for the disposal of wastes, resulting in soil and water resource contamination. The city is all set to adopt an integrated solid waste management strategy to cope with emerging challenges to implementation of projects. A meeting to finalize the report on integrated solid waste management strategy was held on Tuesday with international consultants of **Cities Development Initiative for Asia (CDIA),** a regional initiative that provides assistance to Asian cities to bridge the gap between their development plans and the implementation of their infrastructure projects. "We incorporated ideas and suggestions today. The final report will be adopted by the Chennai Corporation shortly. Any new project pertaining to solid waste in the city will be designed and implemented according to the strategy," said a senior official of the Corporation- **the HINDU NEWSPAPER, DECEMBER 18, 2013**. Recent high levels of urban growth and consumption led to increasing pressure on the environment issue in Chennai town. On screening it would be observed that many areas in the Chennai city are covered with refuse dumps. This current situation is sharply in contrast to what the town used to be many years back when many trees blossomed and the streets were beauty to behold. The large waste that collects almost in every street corner is a clear indication that there is a lack of proper and efficient SWM. The feedback from the officer of Municipal Corporation office clearly showed that the staffs are determined and willing to do their work which they always did. However, they mentioned. Several challenges that prevented that smooth and effective delivery of their service. These include: insufficient knowledge of SWM among the residents, insufficient work vehicle, less number of workers. These challenges are listed with research reports.

KODUNGAIYUR DUMP YARD VIOLATING RIGHT TO LIFE

Definition of Key words

1. Solid Waste Management : The collection , transport , processing, managing and controlling of solid waste materials;
2. Environment Management: The encompasses a living and non-living management of occurring in nature on earth.
3. Reuse: this is to use again especially in a different way or after reclaiming or reprocessing.
4. Reprocess and composting: This is processing used materials (wastes) into new products to prevent waste and this is the aerobic decomposition of biodegradable organic matter producing compost.

Research Study Area:

In the Expanded Chennai Corporation (200 Wards), after delimitation of Zones & Wards, Kodungaiyur will fall under Ward No: 34, 35, 36 & 37 (all the 4 wards will come under Zone No: IV as per the new expanded corporation limits). 13° 8′ 27.46″ N, 80° 14′ 53.43″ E 13.140961, 80.248175

Review of Literature:

The issue of poor solid waste management (SWM) is a challenge throughout the world, in both developed and developing countries. People always generate solid waste through their daily activities. This solid waste needs to be properly managed in a way that minimises risk to the

environment and human health, which means storage, collection and proper disposal. At the same time solid waste creates livelihoods for the urban poor in terms of employment and business. This paper looks into one aspect of SWM, namely collection service. The importance of SWM is now recognised at international, national and community level. The Agenda 21 declaration of the United Nations **[UN. (1993). The global partnership for environment and development: A guide to agenda 21** ***(pp. 88–94)***. New York: United Nations] addresses the issue of environmentally sound management of solid waste, with emphasis on the extension of solid waste service coverage to all urban and rural areas worldwide.SWM is a service for which local governments are usually responsible. However, due to inadequate capacity in the public sector, in many developing countries the private sector has stepped in to fill the gap in service provision. **Dar es Salaam (DSM), Tanzania, is one such developing country city in which the private sector has become involved in solid waste collection services**. The sector comprises Non-Government Organisations (NGOs), Community-Based Organisations (CBOs), and local private companies **[Kassim, S. M., & Ali, S. M. (2003). Private solid waste collection SERVICE, Dar es Salaam Tanzania.** In Proceedings of the 29th WEDC international conference: Towards millenium development goals. Abuja Nigeria, Water and Engineering Centre WEDC]. The private sector in solid waste collection in DSM has been promoted by Sustainable DSM Programme (SDP) through Environmental Planning and Management (EPM) [UNCHS. (1994a). Sustainable Human Settlements Development: **Implementing Agenda 21; UNCHS. (1994b). UNCHS (Habitat) Activities; New Envoy to UNCHS from the United Republic of Tanzania.** ***Habitat News, 16,*** **1–3].** Contracting out of solid waste collection services to the private sector has emerged to fill the gap in service delivery. In 1991 the city was generating 1400 tonnes of solid waste per day out of which only 5% was being collected. Currently daily solid waste generation is estimated at about 2500 tonnes and approximately 48% of the total waste generated is collected. **At present, privatisation covers 44 out of 73 city wards, and 45[1] active registered private companies are involved [Chinamo, E. B. M. (2003).** An overview of solid waste management and how solid waste collection benefits the poor in the city of Dar es Salaam. Solid waste collection that benefits the poor, Dar es Salaam, Tanzania, Collaborating Working Group on Solid

Waste Management in Low and Middle -Income Countries (CWG)].This paper presents the findings of a study that explored the households' perspective on solid waste collection services provided by the private sector. The study showed that the solid waste collection service by the private sector is greatly influenced by households' attitudes and behavior. Their participation, demand for service, awareness, satisfaction level and views on cost recovery are important in the sector. The study concludes that the above factors would be superior if customers (households) were more involved in the planning and decision-making.

Objective of Study:

- To study about Natural Environment.
- To analyse the Household Solid waste Management
- To examine the solid waste Management
- To Study about the Knowledge of Resident about SWM.

METHODOLOGY

The waste Reduction study questionnaire survey that was employed for the project. A total of 600 surveys questionnaires were randomly administered among households around kodungaiyur area. Conducted face-face interviews. One member of each household who was within the age bracket of 18-74 years was selected to be interviewed. The questionnaire design consists of seven sections: Natural Environment; Household solid waste management; Concerns about Solid Waste Management; willingness to participate; Solid Waste Management Attitude Scale; Environmental health and demography.

RESULTS

The results are simultaneously presented in tables in the order of the respective sections of the WRSQS questionnaire.

TABLE 1: THE NATURAL ENVIRONMENT	Correction definition (%)	Wrong definition (%)	No Idea (%)
1.Ability to define the term natural environment	23.3	3.3	73.4
2 .Concern about the current state of the environment	80	10	10

3. What is being considered as the major issue that affects the environment	Automobile	Sewage pollution	The individual person (%)	Factors (%)	Household (%)
	6.7	36.5	6.7	6.7	36.7
4.Individual effect on the environment	No effect (%)	Some effect (%)	A Lot of effect (%)	No opinion (%)	
	3.4	23.3	60.0	13.3	

It is obvious that a great number of respondents (80%) are concerned about the current state of the natural environment but have a shallow knowledge on what constitutes the natural environment. A majority (73.4%) of the respondents had no idea of what the Natural environment entails. A greater percentage of respondents (36.7%) considered household garbage to be the major issue that affects the environment. This was closely followed by sewage pollution (36.5%). The individual person was believed by majority of the respondents (60%) to have the most effect on the environment.

Table 2. (Household Solid Waste Management)

1.Method of household garbage storage		Closed Container (%)		Open Container (%)		Plastic Bag (%)		Other (%)	
		43.3		26.7		10.0		20.0	
2.Method of household garbage disposal	Burn (%)	Bury (%)	Dump in river (%)	Dump on road(%)	Garbage truck (%)	Recycle (%)	Reuse (%)	Compost (%)	Other (%)
Food waste	16.7	3.3	10.0	3.3	40.0	6.7	0.0	16.7	0.0
Yard trimmings	53.4	3.3	3.3	3.3	10.0	0.0	13.3	0.0	0.0
Paper /Cardboard	73.4	3.3	0.0	0.0	13.4	0.0	3.3	0.0	3.3
Plastic	40.0	6.7	3.3	0.0	26.7	6.7	13.3	0.0	3.3
Metals	13.4	3.3	3.3	0.0	3.3	16.6	0.0	0.0	6.7
Glass	6.7	6.7	10.0	0.0	6.7	16.6	0.0	0.0	6.7
% Average	33.9	4.4	5.0	1.1	14.3	7.7	6.1	2.7	3.3

Majority of the respondent (43.3%), reported that most of their household garbage are stored in a closed container, while some (26.7%) store theirs in an open container, few (10%) in plastic bags and others (20%) pile garbage in the yard.

Burning constituted the major method of household garbage disposal by respondents (33.9%). Many others (14.3%) make use of garbage truck, few of the respondents made use of other methods such as: composting, recycling, reuse, use of garbage truck, etc.

TABLE 3: CONCERNS ABOUT SOLID WASTE MANAGEMENT

S.no	Issue for concern	Concerned (%)	Not Concerned (%)	No opinion (%)
1	Health risk related to burning waste	96.7	3.3	0.0
2	Illegal dumps water bodies	80.0	6.7	13.3
3	Disease related to improper storage and disposal	100.0	0.0	0.0
4	Flooding due to garbage blocking drains and gully	93.4	3.3	3.3
5	Reduction of natural resource we buy and use	90.0	6.7	3.3
6	Service provided by garbage tuck	60.0	3.3	36.7
7	Presence of rats	86.7	0.0	13.3

Generally the majority of respondents showed concern about issues of solid waste management. All respondents (100%) were concerned about the diseases related to improper waste storage and disposal and only a few (3.3%) were not concerned about the health-risk related to burning garbage.

TABLE 4: WILLINGNESS TO PARTICIPATE

S. No	Willingness	Yes (%)	No (%)	Don't know (%)
1	Composting	70.0	16.7	13.3
2	Recycling	73.3	20.0	6.7
3	Willingness to separate material for collection	86.7	13.3	0.0
4	Willingness to pay for pickup for recycling materials	66.7	26.6	6.7
5	Willingness to participate in composting programs	83.3	16.7	0.0

6	Willingness to return plastic bottles to stores	76.7	23.3	0.0
7	Willingness to purchase less throwaway products	83.3	16.7	0.0
8	More information on the reduction of garbage	90.0	6.7	3.3
9	Willingness to carry garbage to skiff	90.0	3.3	6.7
10	Willingness to build skiff for the community	86.7	0.0	13.3
11	Willingness to maintain skiff	80.0	6.7	13.3

It is obvious that generally a greater percentage of respondents are willing to participate in efforts aimed at reducing waste, recycling and composting of household garbage and were willing to get more information on how to reduce garbage.

TABLE 5: SOLID WASTE MANAGEMENT ATTITUDE SCALE

S.No	Statement	Agree	Disagree (%)	No opinion (%)
1	Environmental education should be taught in schools.	90	10	0.0
2	I don't care that burning garbage can be bad for my health and the health of others.	13.3	83.3	3.4
3	People throw garbage on the streets and in the drains and gullies because they have no	26.7	66.7	6.6

	other means of getting rid of (disposing of) their garbage.			
4	The Chennai corporation is not doing enough to fix the garbage problem.	80.0	10.0	10.0
5	Regular collection of garbage is the only solution to garbage problem.	83.3	13.3	3.4
6	Public education about proper garbage management is one way to fix the garbage crisis.	90.0	6.7	3.3
7	It is very important that the Chennai corporation put recycling laws and programs in place.	83.3	13.3	3.4

A greater percentage of the respondents (93.3%) believed that the local government is not doing enough to fix the garbage problem. A greater number of respondents (83.3%) agreed that: recycling laws and programs should be put in place in chennai corporation law and regulation; that purchase decisions should be controlled; and that regular collection of garbage is the only solution to the garbage problem. The majority of respondents (90%) also agreed that environmental education should be taught in schools and that public education about proper garbage management is a way to fix the garbage crises. Majority of the respondents (83.3%) were against the burning of garbage.

TABLE 7: DEMOGRAPHY

1. Age Range (%)						
18-24	25-34	35-44	45-54	55-64	65-Above	
20.0	26.7	23.3	16.6	6.7	6.7	

2.Gender	3. Educational Level (%)				
Male – 52 Female-48	No education	Primary-Secondary	Graduate	Above Graduate	
	30	35	30	5	

4. Employment (%)

Employed	Unemployed	Student	Retired	Not of working age
26.7	36.7	20.0	6.7	3.2

5.Income (%)

No Income	Less than 20000	20000-40000	40000 or more	No response
46.7	13.3	6.7	3.3	30.0

Most of the respondents are literate and with a greater percentage (40%) who have received a tertiary education. Majority of the respondents (36.7) were unemployed. A large percentage (30%) did not disclose their income range and majority (46.7%) had no source of income.

DISCUSSION AND RECOMMENDATIONS

The results reveal that many residents do not have complete knowledge of what constitute the natural environment **(Table 1)**. This means there is need for more public environmental education in the schools. Many of the residents complained that the dump sites were insufficient and was rarely cleared by the sanitary workers, a situation which has prompted them to resort to the burning of wastes **(Table 2).** These serves as breeding site for disease vectors as have been identified by the respondents **(Table 5).** Casual workers should be employed to collect household garbage from house to house. The households will have to pay a small token for such services. This survey has revealed that many respondents are willing to pay for such services **(Table 4).**

Dumping of wastes in Kodungaiyur by the Municipal Corporation of Chennai since 1982, has resulted in the overflow of garbage on to the roads, due to which, the 40 feet road running parallel to the dumping ground has narrowed down. Kodungaiyur has become a common dumping ground for garbage collection, from various other dumping grounds like Basin Bridge dumping ground.

Burning of garbage in the dump yard results in thick smoke, thereby, generating pollution. It decreases the visibility on the roads, making the area an accident prone zone.

Due to the unhygienic living conditions, education of the children living in the affected areas is also hampered. "Children are unwilling to participate in physical training activities and frequently miss classes, especially during rainy season", said teacher, **Pranuthi Ravi of a school** (name withheld), "and we are helpless", she added.Although many respondents have toilet facilities in their homes they have identified sewage as an environmental issue. This means that there are many residents that do not have toilet facilities in their homes or if they do, they are poorly constructed. More rigorous sanitary house inspections are required in order to identify those houses without decent toilet facilities or that do not have any at all and appropriate penalties issued.sMany of the respondents believed that there was need for more frequent removal of garbage by the sanitary workers and that recycling laws and programs should be put in place by the Local Government. **(Table 5).**

Many of the respondents were willing to participate in recycling and composting programs if they were given adequate orientation. Some residents are already involved in composting and recycling **(Table 2).**There is a great need for the private sector such as commercial banks to collaborate with the Local Government in the solid waste management efforts. It is the corporate social responsibility of the private sector to partner with the Local Government in the smooth delivery of government functions.

CONCLUSION

This survey project has being able to provide an indication of the current household solid waste management in Chennai City by focusing on the residents surrounding Kodungaiyur as a case study.

The residents are generally concerned about the environment but are not doing enough to reduce, recycle and reuse the household garbage they generate. It is clear from their responses that they are ready to help fix the garbage problem if given the appropriate support from the local government as have been identified in this survey report.

The natural environment requires protection in order to remain healthy for all of its inhabitants. To protect and bring about a healthy and sustainable environment requires the collective efforts of the public, the environmental health authorities and the private sector. Let us all remember these three big words about 'waste': **REDUCE, RECYCLE, REUSE.**

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