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Management Problems and Redressal Mechanism for Urban Sanitation and Solid Waste: A Case Study of L.B Nagar in East Zone of HMDA (Hyderabad Metropolitan Development Authority) of Telangana State of India.

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Abstract

Sanitation and Solid Waste Management is a precondition for development. Municipal Solid Waste management constitutes a serious problem in many third world cities. The main Objectives of this study are to: (i) describe the functions, roles and responsibilities of CBSS and DWCUAs and the extent to which they have been successful to improve the access of the urban poor to Sanitation and Solid Waste Management; (ii) study the current levels of awareness and participation of the community in water supply, including cleanliness of the water source, and safe disposal of waste water and solid wastes; (iii) analyze the redressal mechanism instituted to solve the problems and grievances of the urban communities with regard to sanitation and solid waste management and (iv) bring out case studies / success stories

Key words: Sanitation, Solid waste management, Drainage, Disposal, Participation

and best practices in enlisting the community participation in sanitation and solid waste management and suggestions for improvement. In this paper, an attempt is made to examine the people's participation, factors affecting the implementation of urban sanitation programme and the role of DWCUAs and Community Based Sanitation societies and Private contract system in addressing the needs of environmental sanitation and solid waste management for the poor. Awareness of Solid waste management and sanitation and water usage at house hold level social, income, Occupation and literacy and municipality Cleaning of Roads and drainage, Opinion of the water supply and sanitation, recommendations & suggestions of the study area.

Sanitation and Solid Waste Management is a precondition for the development of any metropolitan area. It is not just the Concerned with keeping the Area clean but it is also concerned with a raising the quality of life of the people so that productivity of the local population could be enhanced. Over 2.6 billion people (40%) of the World population lack basic sanitation facilities and one billion people still use unsafe

drinking water sources.(Water and Sanitation World Health Organization and UNICEF 2006) India had an urban population of 377.1 million as compared to 286.1 million in 2001 censuses with a reported annual growth rate of about 2.67 percent, with much higher growth in poor settlements, As per 2011 censuses(Hand book of Urban Statistics - 2019) . due to It is estimated that the loss in terms of health costs and decline of productivity

sanitation related diseases in India is around Rs 5000 million. Lack of sanitation in India has led to economic losses for the country (6.4 % of India's GDP) WSP, 2010).

Sanitation was a part of town planning and well laid out drainage system even during Indus Valley Civilization. However in urban areas, sanitation was earlier limited to disposal of human excreta by cesspools, open ditches, pit latrines, bucket system etc. Traditionally, the local self-government bodies in cities and other urban areas in India are entrusted with the responsibility of provision of basic civic amenities. In view of rapid urbanization and fast growing slum and low-income population in the cities and towns, service deliveries with limited revenue generation are the main problems. In addition low productivity of staff, political interference, and unionization affects delivery of services. As a solution to these problems, local governments are involving the private sector also.

Aims of the Study:

Sanitation and solid waste management is a challenging issue faced by the urban local Bodies (ULBs) The study aims to examine the quality of urban sanitation services vis-à-vis. the environmental sanitation as well as health hygiene problems in L.B.Nagar (HMDA).

Objectives:

The specific objectives of the study are to:

- (i) describe the functions, roles and responsibilities of CBSS and DWCUAs and the extent to which they have been successful to improve the access of the urban poor to Sanitation and Solid Waste Management
- (ii) study the current levels of awareness and participation of the

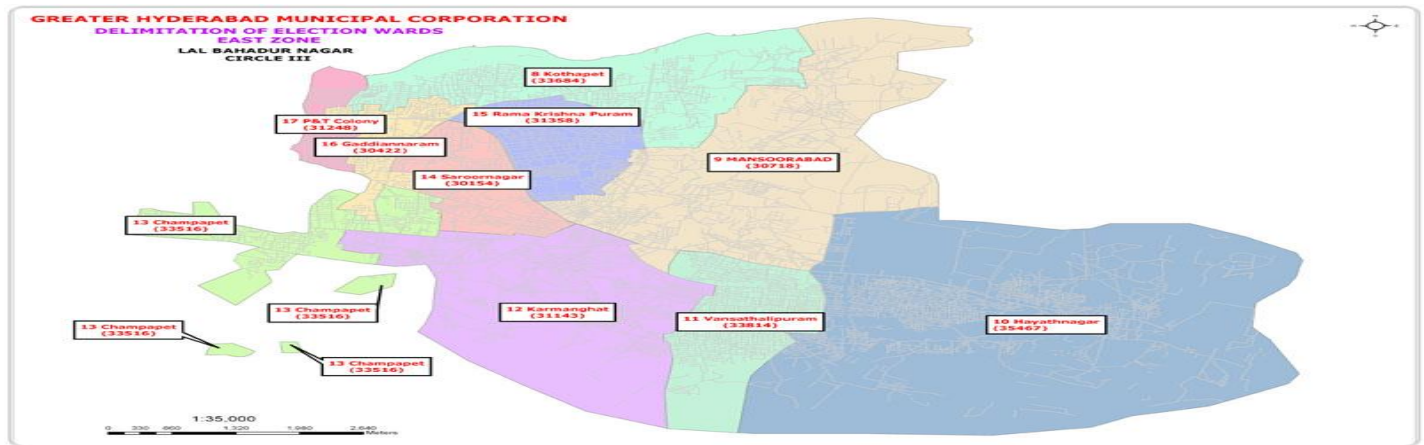
community in water supply, including cleanliness of the water source, and safe disposal of waste water and solid wastes.

- (iii)analyze the redressal mechanism instituted to solve the problems and grievances of the urban communities with regard to sanitation and solid waste management : and

- (iv)bring out case studies / success stories and best practices in enlisting the community participation in sanitation and solid waste management and suggestions for improvement.

Study Area:

LB Nagar and Gaddiannaram are part of HMDA and situated in Rangareddy district (Urban Agglomeration) It had a population of about 4.8 lakhs,with 160000 households as per 201 Censes and a geographical area of 65.0 Sq. km. with 44 municipal wards. Including 75 slum areas. There are municipal corporation wards are 12 namely othapet,Chaithanyapuri,Mansoorabad, Hayathnagar,Vanasthalipuram,Karmanghat,Cham papet,Sarooragar,Ramakrishnapuram, Gaddiannaram P&T Colony, Hastinapuram , B.N. Reddy Nagar covering about 84 slum areas LB Nagar has experienced a steady growth and attracted a large number of public sector enterprises, educational institutions and industries.. It has a rich of experience in implementing innovative urban development projects and consequently enjoys the support of a number of multi-lateral agencies, such as World Bank, DFID, UNCHS, etc.



Source: Greater Hyderabad Municipal Corporation East zone from Google

People's Participation:

The study found a high willingness of the communities in residential colonies comprising middle and lower middle class households. to participate in urban water supply and sanitation issues. The residents of these areas wanted to know about the rules related to water supply and sanitation which are concerned to them and how their money is being spent by the developer and the local body.

The schemes are designed and implemented by the government without consulting the residents of the area. The opportunities for participation exist in residential colonies developed by builders in the public and private sector as the builders are expected to form a Development Committee of the colony. This committee has the responsibility for all the maintenance issues including water supply and sanitation. Moreover, the development fund collected by the builder is also to be handed over to this committee. The important reasons for poor sanitation, were found to be lack of proper planning, inadequate emphasis given for the implementation of rules and indifference of people and the people's representatives in giving priority to sanitation.

However, the factors responsible for poor implementation of urban sanitation programmes found to be (i) very low priority accorded to sanitation as a social and community issue (ii) inadequate emphasis on IEC, (iii) lack of infrastructure and systems to reach all urban households, (iv) heavy reliance on subsidy, (v) lack of motivation among implementers, (vi)

scarcity of water, (vii) lack of technology support according to people's needs, and (viii) insufficient involvement of NGOs and CBOs and the private sector.

The participation of the local community could be noted in the operation and maintenance of the systems created, in planning, technology selection, and implementation of the project. The various programmers were driven by a top-to-bottom approach and entirely managed by the government or its agencies as the funds were available in the form of a revolving fund. Partnership arrangements between the public and private agencies with the involvement of the community networks such as NGOs and community based organizations (CBOs) were found to be the most effective mechanisms for efficient delivery of public services.

LB Nagar Municipal circle with the help of DWCUAs and Community Based Sanitation Societies (CBSS) and private contract system adopted innovative methods to address the needs of environmental sanitation and solid waste management for the poor. Although, it is accepted that involvement of private sector leads to efficient delivery of services and additional resources, yet it may lead to exclusion of poor due to high cost of service delivery. Therefore, it is necessary to examine the potential impact of this private public partnership (PPP) arrangement in terms of cost saving, improvement in efficiency, effectiveness of service delivery, improvement in public health and environmental improvements. In addition, its effect on the poor in terms of

employment and improved access to health also needs to be examined. This study examines the experiences of CBSS and DWCUAs in providing environmental sanitation services in L.B. Nagar Municipality through community sanitation and solid waste management to the poor communities. The study also assesses and evaluates, through household surveys and group discussions the impact of these services on the poor.

Solid Wastes in Hyderabad:

Greater Hyderabad generates about 5000 tons of waste per day (T.P.O), which amounts to 1.83 million tons per year. (Muralikrishna et.al. Geo – Geosciences 2014,3.2) It is- an appalling phenomenon and how wastes in Hyderabad unlike in other cities can be thrown from ones house without considering the long-term effects of the same. One of the adverse effects is the loss of the natural attraction of River Musie which separates the old from the new city of Hyderabad , L.B Nagar municipal circle generates about 185 metric tons waste per day , which amounts to 67525 tons per year.

Waste Generation and Management: The waste management involves proper channels of waste collection, transportation and disposal. (14) In order to understand waste generation and management the number of sanitary workers (both public and private) was taken as a measure against the total waste being generated in different regions of the Hyderabad. .

Sources of waste:

In order to properly manage the solid waste being generated in Hyderabad the sources , it is important to understand that the sources of wastes is mainly the domestic households (60-65 percent) in the Hyderabad municipal development corporation . The next source of waste is streets and drains, followed by hotels and restaurants markets, commercial establishments, industries etc. Hospital climes and construction sites are noticed as the least waste generation sources.

Solid Waste Disposal:

All the local bodies have dumping grounds for solid waste disposal, but none of these have a system of segregation of solid waste either at the point of collection or disposal. The Nagar Panchayats and the Municipal Councils have a

system of solid waste being collected in tricycles and then ferried by tractors and dumper placers to the dumping ground. The municipalities have an infrastructure that includes garbage collectors (from dustbins or open spots), designated collection point at the ward level from where the dumper carries the waste to the dumping ground.

In all the towns, the upper class colonies have a better network of dustbins and a better frequency of their disposal. The remaining town is denser, generates more waste and has less space to dispose it. The prevailing attitude in the middle and lower middle class residents is that they see to it that their own house is clean but the garbage generated is disposed of either in front of their own house or in an open space near the house. The ruling of Supreme Court regarding SWM and the action thereof has resulted in all the local bodies submitting proposals for identification of trenching ground, vehicles, provisions for segregation, etc.

LB Nagar municipality has 44 wards and is divided into seven sanitary divisions for sanitation with collection centers clearly demarcated. It is having three garbage waste collections through community based sanitation, urban SHGs for women under DWCUA and Private Contractor system. The percentage covered through privatization is 90 percent and remaining 10 percent by the Municipality. Out of 352 colonies 287(65%) colonies are provided sewerage system Total length of sewerage work covered is about 778 Km, of which laterals is 736 km while Main line is 42 Km. There are 634 Workers, 345 tricycles 18 tractors and 5 dumpers vehicles. Entire waste is dumped at the dumping ground at Fathullaguda which is 8Km outside the municipality. It can be ferried to the trenching ground. The total cost of sweeping, collection, dumping and transportation is Rs. 840 per tones. Every day the municipality generates solid waste of 175.25 metric tons which requires an expenditure of Rs 1.26 lakhs per day, at an efficiency level of 70 per cent. Dustbins are a rarity. The total length of the Roads is 1089.79 Km and of this 389 Km is BT roads, 55.79 Km C.C. roads , 380Km metal roads and 261 Km unformatted kacha roads. Various Civil societies are working in the Municipality include 705 community groups 280 Welfare Associations, 272

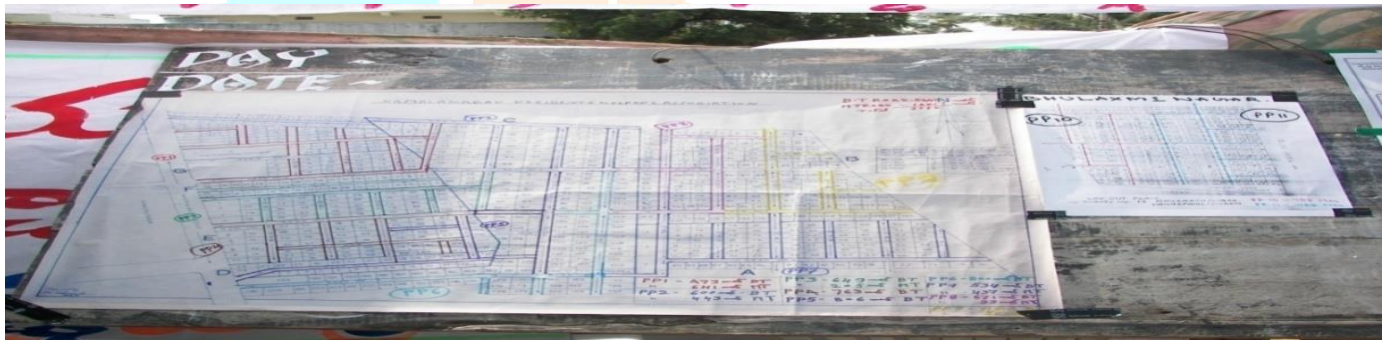
RCVs, 75 DWCUA groups, 33 Neighborhood groups, and 2 Community Development Societies.

Water supply: The water supply scheme is taken recently by the HMWS & SB. There are three supply reservoirs 1071 hand bore wells, 245 power bore wells in this area. Present coverage with regard to distribution lines are sourced over 60 percent, with 45500 house service connections and 120 PSPs. Percentage of area covered through protected water supply is about 72 percent and length of distribution pipe lines covered is about 210 Km. There are 16 mobile water tankers with each tanker capacity of 5000 liters functioning in the area.

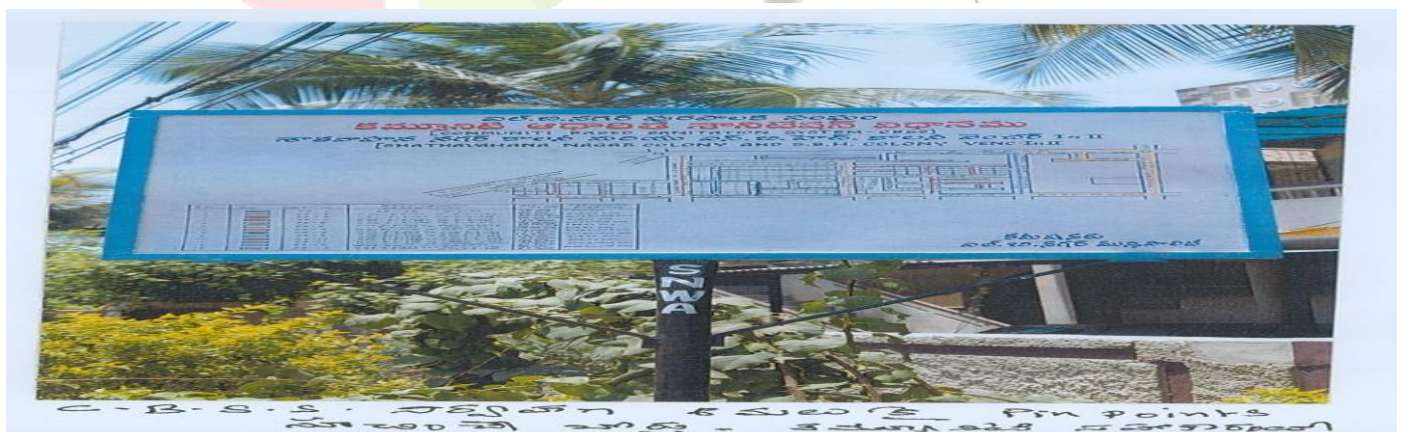
Community Based Sanitation Societies:

The role of community based sanitation societies, which were established on 3rd December-2006, in seven colonies in LB Nagar

Municipality is well appreciated for achieving source segregation and Litter free Area sanitation through total Community Participation under Programme called Community Based Sanitation System (CBSS). The Municipality intends to encourage and empower community based organizations like Residents Welfare Associations to come forward and organize day to day sanitation work in their respective areas on payment with appropriate amount of services cost. Financial responsibilities of resident welfare associations include handing over (i) Wages to supervisor (ii) Twin bins to all households through sponsors/ residents (ii) Awareness campaigns through banners, pamphlets, tom-tom, boards etc, on quarterly basis and (iv) Pin Point System Boards specifying worker wise area and periodicity.



PIN POINT SYSTEM – MAP SHOWING THE WORKER WISE PIN POINTS IN COLOURS



Sanitation Work entrusted to RWAs (Resident Welfare Associations) include activities like (i) surface cleaning of streets and roads including lanes and by lanes, collection of litter, garbage and other solid wastes which include small dead

animals, attending to Footpaths, Public Open places, Road side Shrubs besides . any other place in the area specifically directed by authorities (ii) Disposing of collected solid waste in the garbage collections points (storage facilities)(iii) garbage

and litter thrown into the small drains and nalas passing through the slums and bastis also to be removed.(iv) Implementation of Pin Point System (V) Cleaning of Water Stagnated Points and (vi) Sprinkling of Disinfectants.

Process: The ULB enters into an agreement with RWA for a period of 6 months to undertake the work and agreement is renewed based on performance. The RWA;s have to comply with the following mandatory conditions as laid down in “MSW (M&H) Rules, 2000 at their own cost: (i) Source segregation by distributing / ensuring twin bin for each house hold in the area for wet and

dry garbage(ii) collection of segregated waste through cycle rickshaws (iii) Implementation of “ Prohibition of Littering in the area”(iv) Ensure that wastes are not burnt as it is illegal (v) Organize the awareness programmes regularly through distribution of pamphlets, display of banners, erection of display boards , organizing meetings on source segregation , door to door collection , prohibition of littering in the area and involving the community in all sanitation work (vi)Assisting circle in imposing penalties in case of violations and (vii) Appointment of one supervisor by RWA at their Cost.

Community Based Sanitation Societies in LBNagar Municipality

Kamalanagar and Bhulaksminagar	Sathavahananagar SBH-I& II
<p>This was established on 3rd December 2006, with the help of the Municipal Commissioner LB Nagar. It formed a committee with President, Secretary , Treasurer and members to meet every month to discuss and monitor the received grievances ,and solve the problems. It is having two Residential Welfare Associations namely (i) Kamalanagar (ii) Bhulakshminagar in the Society. The main activities of the Society are(i) sweeping all the roads (ii) door to door collection of Solid waste, (iii)cleaning of vacant plots(iv) cutting and lifting of the unwanted grasses and herbs beside the roads .</p> <p>The society area covered 620 houses, 1800 families, population of 5250 and 8 pinpoints. the society has 7,225Km of roads.</p> <p>The financial sources for the society include collecting every month Rs 15/ from the residents of the colony and donations from shops, hospitals, hotels and other voluntary sponsoring of the residents of the Colony. There are 1500 households in Kamala nagar and 200 households in Bhulakshminagar colony. The total expenditure is Rs 21,700 , with worker Wages and Transportation charges Rs 18000 borne by the municipality (83%) while remaining expenditure like salary of supervisor and publicity charges including wall writings display boards from the society</p> <p>The roles and responsibilities of the</p>	<p>It was established on January 1st 2007 with the help of the Municipal Commissioner,L.B nagar with four residential welfare associations namely 1) satavahananagar,2) SBH colony phase- 1, 3) SBH colony phase- 2 and 4) Bhavaninagar with 590 houses,1740 families, population of 13572,13 pinpoints,1 collection point,4 tricycles,13 sweepers and 4 tricycle operators The society covers 9.8km roads.</p> <p>The main aims of the society include : (i)door to door collection of solid waste(ii)sweeping and cleaning of roads(iii)cleaning of vacant places(iv)cutting and lifting of grasses, herbs and unwanted materials beside the roads(v)Meeting with residents of colonies every Saturday and (vi) Creating awareness on sanitation among the residents.</p> <p>The financial sources of the society include collection of Rs. 10 per month from the residents of the colony and donations from shops, hotels, restaurants, clinics and hospitals, paper and milk agencies, and through selling of dry solid waste like papers, bottles, plastic covers from the colony. The total expenditure of the colony is Rs. 41118 as workers wages and transportation charges from the municipality. Remaining expenditure of supervisor and rickshaw person’s wages, and publicity, wall writings, display boards</p>

<p>supervisor include taking four times labour attendance every day, supervision, submission of bills, giving salaries to sanitation workers and assistance to the society. Through this system, the effectiveness of Sanitation and cleanliness is improved to the large extant</p>	<p>from the societies.</p> <p>The roles and responsibilities of the Supervisor includes is taking four times labour attendance every day, supervision, submission of bills, giving salaries to sanitation workers and assistance to the society.</p>
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Development of Women and Children in Urban Areas (DWCUA):

DWCUA groups are given contracts for improving sanitation and solid waste management through waste collection and other sanitation services. These groups are area-based community groups organized as a part of SJSRY (a Government of India programme for employment of the urban poor). The Municipality facilitates the formation of these groups comprising women.

Implementation Arrangement: These groups arrange finances for sanitation vehicles and equipment. The Municipality gives these groups the responsibility to sweep, clean, collect and transport garbage from their neighborhood area. The community group is also responsible for cleaning streets and drains, by desilting and removing garbage, in their respective area.

Financing Plan Municipality arranges finances for sanitation vehicles and implements by acting as an intermediary to facilitate in bank borrowing. Each community group member is paid Rs. 55 per day towards labour charge and Rs. 5 per day towards a group corpus fund. The corpus fund is used for purchase of uniforms, shoes and implements that are used by the workers.

Current Status: By May 2017 there were more than 25 community-based groups participating in the DWCUA programme, including three night sanitation groups. Together they covered more than 20 percent of the town area. The scheme has resulted in cost savings for the Corporation as well as better service performance because of local community involvement. This programme has also helped in eliminating caste bias associated with such activities. Women from various communities are coming forward to participate in the scheme.

Case Study: The study of (i) Arunajyothi Dalita Mahila Sangams and (ii) Mahalakshmi Podupu, Siva shakthi, Jyothi sangam and others formed on 1-4-2006, reveals that the first two groups have 30 members, one tractor. and the next four groups having 50 members, one Dumper placer. These groups have covered 8 colonies namely Laxminagar, Vijayapuri colony, SBH colony, Telephone Colony, Sowbhaghyapuram, Kalkinagar, Ramakrishnapuram and adjoining areas of L B Nagar municipality. These groups have covered all the colonies; one group belongs to SC community. The groups work 8 hours per day and every member gets a wage of Rs 80 per day. These groups have 8 years experience in sanitation works. Before formation of group, the members worked under contractor, and the wages were only Rs 1500/- Per month. The members of these groups attended Agricultural works before involving in sanitation work. Under contract system certain problems faced were irregular payment of wages and lesser amount of wages. After formation of groups regular payments and providing work on a regular basis were ensured. The major functions of the groups are Sweeping, Grass and Bush clearance, and burning and lifting of Solid waste

Impact of CBSS and DWCUAs is reflected in: (i) Effective Door to Door Collection,(ii) Coverage of households including tenants in the colony,(iii) Source segregation at household level – provision of two bins, (iv)Pin-point system of cleaning and sanitation in place, (v) Effective supervision of road sweeping and cleaning activities, (vi) Litter free areas – prohibition of littering notified and implemented, (vii) No burning of wastes ,(viii) No garbage found in open places(ix) 95% reduction in

collection points.(x) Cost shared by community to the tune of 43 percent, (xi) Effective implementation of sch.II & Rule .7 of MSW(M&H) Rule,2000, (xii)Owning the

programme by the communities, (xiii) High citizen satisfaction and (xiv) ULB rating improved through a sustainable initiative.

Table – 1: Awareness Levels and Practices in Water and Sanitation & Solid Waste Management (%)

S.No.	Components	Category / Scaling	Social Group				Occupational Group				Total	
			OC	BC	SC	ST	Businessmen	Govt./Pvt. Employee	Wage Labour	Others	N	(%)
1	Level of Awareness	Excellent	--	--	--	--	--	--	--	--	--	--
		V.Good	16.7	16.7	10.0	--	--	35.7	--	--	5	12.5
		Good	75	33.33	20.0	--	54.54	50	7.14	100	15	37.5
		Average	8.3	41.66	60.0	33.3	45.45	7.14	57.14	--	14	35
		Poor	--	8.3	10.0	66.7	--	7.14	35.71	--	6	15
2	No. of times sweeping is done in Your House per day	once	--	--	--	--	--	--	--	--	--	--
		twice	75	50	60.0	50.0	45.45	85.7	50	--	24	60
		Thrice	16.6	25	30.0	50.0	27.27	14.3	35.71	100	11	27.5
		Above3 times	8.3	25	10.0	--	27.27	--	14.28	--	5	12.5
3	No. of times Water Washing is done per Week in your House	once	33.3	25	30.0	50.0	36.36	28.6	35.71	--	13	32.5
		twice	50	58.3	30.0	33.3	36.36	42.9	57.14	--	18	45
		Thrice	8.3	16.67	40.0	--	18.18	21.4	7.14	--	7	17.5
		Above3 times	8.3	--	--	16.7	9.09	7.14	--	100	2	5
4	Mode of Water Supply and storage in Your House	Tap System	66.7	41.67	10.0	--	36.36	64.3	--	100	14	35
		Tub system	8.33	8.33	--	33.3	18.18	14.3	--	--	4	10
		Drums	25	50	90.0	66.7	45.45	21.4	100	--	22	55
5	Domestic Use of Water In your House	100liters	33.3	8.33	10.0	--	9.09	7.14	21.4	100	6	15
		200liters	25	58.33	40.0	100.0	54.54	42.9	57.14	--	20	50
		300liters	33.3	16.67	50.0	--	27.27	35.7	21.43	--	11	27.5
		400 liters	8.33	16.67	--	--	9.09	14.3	--	--	3	7.5
	N.		12	12	8	6	11	14	14	1	40	100
	%		30	30	25.0	15.0	27.5	35	35	2.5		

Table – 2: Awareness Levels and Practices in Water and Sanitation & Solid Waste Management (%)

S.No.	Components	Category / Scaling	Social Group				Occupational Group				Total	
			OC	BC	SC	ST	Businessmen	Govt./Pvt.Employee	Wage Labour	Others	N	(%)
6	Use of Water in Your Latrine	5 liters	33.3	25.0	--	--	9.09	21.4	14.28	100	7	17.5
		10 liters	50.0	50.0	70.0	60.0	72.73	71.4	35.71	--	23	57.5
		15 liters	8.3	25.0	30.0	20.0	18.18	--	42.85	--	8	20
		20 liters	8.3	0.0	--	20.0	--	7.14	7.14	--	2	5
7	How Many Times Cleaning of Latrine is done per Week	Once	33.3	25.0	30.0	50.0	9.09	28.6	50	100	13	32.5
		Twice	33.3	33.3	60.0	16.7	63.64	50	7.14	--	15	37.5
		Thrice	25.0	41.7	10.0	16.7	27.27	14.3	36.71	--	10	25
		Above Thrice	8.3	--	--	16.7	--	7.14	7.14	--	2	5
8	Disposal of Solid waste in your House per week	once	--	8.3	10.0	50.0	--	--	--	--	5	12.5
		Twice	16.7	16.7	40.0	16.7	--	7.14	28.57	--	9	22.5
		Thrice	58.3	16.7	20.0	--	11.11	14.3	47.88	--	11	27.5
		Four times	16.7	58.3	30.0	33.3	45.45	35.7	7.14	--	14	35
		Above 4 times	8.3	--	--	--	45.45	42.9	21.43	100	1	2.5
9	Lifting of Garbage in your Street per week	Once	25.0	33.3	70.0	66.7	45.45	42.9	50	--	16	45
		Twice	8.3	25.0	10.0	--	18.18	21.4	--	--	5	12.5
		Thrice	25.0	33.3	20.0	33.3	27.27	14.3	42.88	--	11	27.5
		Above 3 Times	41.7	8.3	--	--	9.09	21.4	7.14	100	6	15
10	Opinion on Water supply and sanitation in Your Municipality	Excelent	16.7	16.7	20.0	33.3	27.27	14.3	21.43	--	8	20
		V. Good	16.7	--	--	--	--	14.3	--	--	2	5
		Good	25.0	33.3	--	--	18.18	35.7	--	--	7	17.5
		Average	33.8	25.0	30.0	--	27.27	14.3	28.57	--	10	25
		Poor	8.3	25.0	50.0	66.7	27.27	21.4	50	100	13	32.5
	N.		12	12	8	6	11	14	14	1	40	100
	Total		30.0	30.0	25.0	15.0	27.5	35	35	2.5		

Households Level Sanitation:

Sanitation and Sanitation and solid waste management at household level is analyzed on the basis of Socio - economic conditions (Social category and Occupation) of the households. There is an improvement in awareness levels , sweeping, washing , defecation type, situation and model of latrine, Mode of water storage and supply , usage water (Domestic , latrine) cleanness of latrines, drainage , cleaning of roads and drainage, scaling of

opinion on water supply and sanitation , disposal of solid waste , storing facility, mode of transport, lifting of garbage and solid waste generated .

Sanitation at house hold level has been analyzed by taking a sample of 40 households on random basis in various areas of LB Nagar Municipality. The household level sanitation based on variables social category and occupation of the household as independent variables, and sanitation as dependent variable.

The parameters considered for analysis include (1) Household Level of Awareness on sanitation , (2)No. of Times in Sweeping , (3)No. of times water washing per week (4) Place of Latrine Construction (5) Mode of Water supply , (6)Usage of Domestic Water (7) Use of Water in Latrine (8) Disposal of solid Waste (9) No. of Times Cleaning of Latrine per Week and(10) cleaning of roads and drainage , (11) Lifting of garbage from the street per week (12) Opinion on Water Supply and Sanitation .

Among the households response recorded highest 30 percent in O.C and BC 's lowest 15 percent in ST Communities and, occupation wise highest in 35 percent in Govt and Private Employee and Wage labor , lowest in 2.5 percent others respectively (Table – 1 and 2).

The awareness levels and practices in water and sanitation & solid waste management among the sample households by social and occupational groups are presented in table-1. It may be noted that the levels of awareness among the sample households could be termed very good or good only in the case of 50 per cent, but relatively better in the case of OCs (75%) and businessmen (55%) when compared to the remaining groups. A majority (60%) of the sample households undertook sweeping in their houses twice a day, the corresponding percentage being higher in the case of OCs (75%) and govt./pvt. employees (85%) when compared to the remaining groups. Only 45 per cent of the sample households undertook water washing in their houses twice per week, the corresponding percentage being slightly higher in the case of BCs, OCs and wage labourers as compared to the

remaining groups. A majority (55%) of the sample households kept drums for storing water, the corresponding percentage being higher in respect of SCs, STs and wage labour as compared to the remaining groups. Over three-fourths of the sample households used about 200 – 300 litres of water per day for domestic consumption. Similarly, over three-fourths of the sample households used only 10 – 15 litres of water for cleaning latrines in their houses. About 70 per cent of the sample households undertook cleaning of latrines only once or twice a week. Only 30 per cent of the sample households undertook cleaning of latrines thrice or more a week, relatively better in the case of BCs and wage labour when compared to the remaining groups. Regarding solid waste management practices, it could be seen that about 63 per cent of the sample households dispose of the solid wastes three to four times per week, the corresponding percentage being higher in the case of OCs and BCs (75%) when compared to the remaining groups. A majority (58%) of the sample households reported that garbage was lifted from their streets only once or twice a week, while the rest of them reported that it was lifted thrice or more per week. Only about 43 per cent of the sample households reported that the water supply and sanitation & SWM was good/ very good/ excellent in their municipality, the corresponding percentage being higher in the case of OCs and govt./pvt. employees when compared to the remaining groups. Thus, a majority (57%) of the sample households felt that the water supply and sanitation and SWM in their locality is average or poor.

It follows from the above analysis that water supply in the case of a majority of the

sample households ranged between 200 and 300 liters per day, which needs to be increased further for improving the cleanliness and sanitation in their households. Similarly, the cleaning of latrines and water use for this purpose also needs improvement. Further, a majority of the sample households had a poor or average opinion on water supply and sanitation & SWM in their localities, which implies that the present practice needs betterment. This serves as a pointer to the need for putting more strenuous efforts than before by the concerned municipality to improve water supply and sanitation and SWM.

Recommendations & suggestions in Urban Areas are:

(i) Reducing political involvement in Sanitation and Solid waste management programmes. (ii) Discrimination of Low and High income group living areas. (iii) Strengthening of SHGs, DWCUAs, and Mahilasamakyas slum Areas. (iv) Improve the Decision making and Self – Confidence of DWCUAs (v) Everyday sweeping and cleaning of roads in residential areas (vi) Each family to implement the two dust bin system. (vii) Improve the quality of underground drainage system (viii) Spraying oil at water logged areas and prevent mosquitoes in rain season (ix) Effective monitoring by municipal staff and also to great awareness among the residents (x) Prioritization of avoiding polythene covers and glass material on roadside and open places. (xi) Increasing number of Skilled persons sanitation programme (xii) Providing Health campaigns and increased health facilities (xiii) Involvement and responsibility through local community participation in sanitation and solid waste management (xiv) Frequency blowing of fog machines and good quality of chemicals to

prevent mosquitoes. (xv) Encouraging formation of local resident welfare associations and motivate creative awareness. (xvi) Every day must lifting the Garbage (xvii) Technology based machines using removal of seweraging in drainages in urban areas.

In the present day of technological evaluation, the solid waste management is occupying a permanent role at all urban Areas. At some centres, establishment of units for generation of power from the solid wastes are under active examination of the departments. This aspect is to be looked into with a focused attention. This, on one hand, reduces the burden of maintenance of MSW and on the other hand paves way to low cost power generation. Also, a process of development for usable by-products from the qualified wastes will also be of good help for waste management. The aspects of conversion of solid waste into bio-manures etc which will strengthen the soil is also a matter of interest in solid waste management.

The current MSW disposal services are insufficient and there is a need for updation with more profitable recovery recycle and reuse technologies to reduce the fraction of wastes and huge expenditures in the treatment process. The focus should be on the post processing of by-products of municipal solid waste treatment in form of leachate, refused derivative fuel (RDF) and compost which has potential for agricultural and industrial applications. Best available technologies have been focused on methods to reduce the wastes as is done in the developed countries by recovery measures, energy and value added transformed products of wastes processing from sanitary landfills. RDF can be used as fuel for incineration industries like cement and

construction and leachate as nutrient and water source of green belt development.

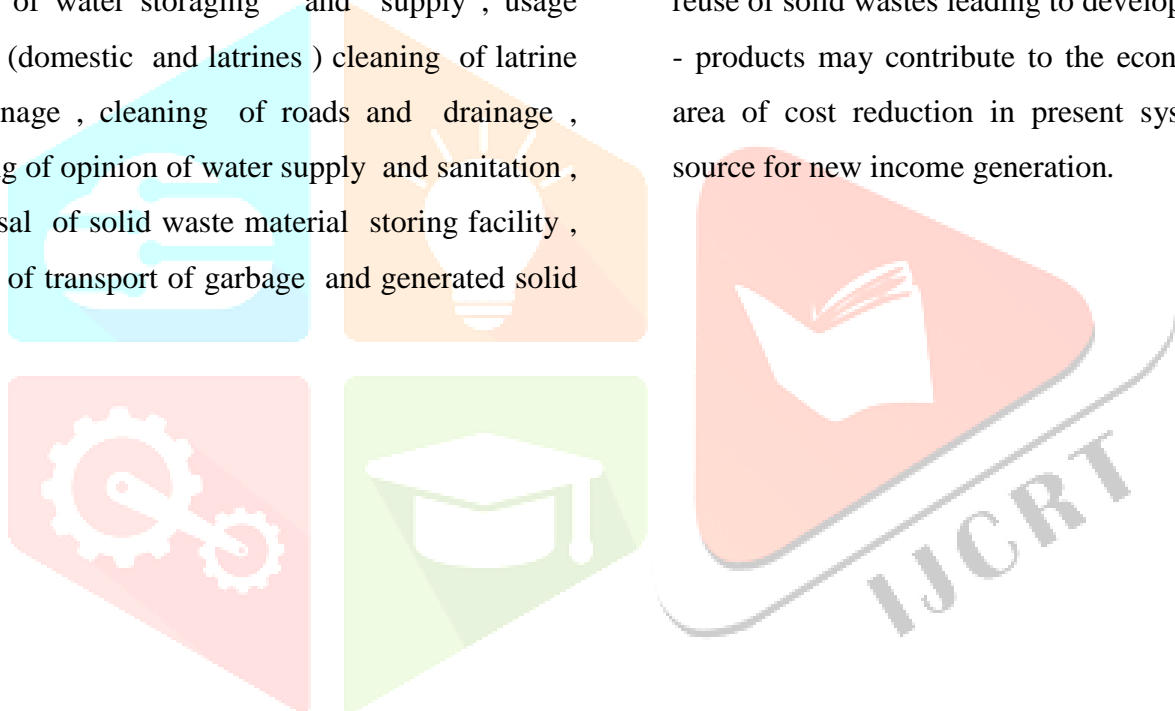
Conclusion

The municipality gives these groups the responsibility to sweep, clean, collect and transport, garbage from their neighborhood area. Sanitation and solid waste management and utilization of domestic water at house hold level on the basis of socio-economic conditions (social category and occupation) of the households were analyzed , awareness levels , sweeping , washing , defecation type situation , mode of water storaging and supply , usage water (domestic and latrines) cleaning of latrine , drainage , cleaning of roads and drainage , scaling of opinion of water supply and sanitation , disposal of solid waste material storing facility , mode of transport of garbage and generated solid

waste position of the households and recommendations and suggestions of the study area .

The rapid urbanization in India would generate higher demand for scientific and sustainable municipal solid waste management technologies along with the pivotal role of green technologies.

India being a developing economy, both agriculture and industry are equally important for the economic growth. An organized and proper solid waste management system through innovative methods of recycling, recovery and reuse of solid wastes leading to development of by - products may contribute to the economy in the area of cost reduction in present system and a source for new income generation.



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