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A study to assess the Knowledge and Practices on Household Waste Management among the Slum Dwellers of Kamrup Metro, Assam.

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Abstract

Background: *The house in which you and your family live needs to be clean and hygienic for the good health of your family. Home is the first place from where waste management can be initiated. More than 90% of waste in India is dumped in an unsatisfactory manner. The rapid growing population and urbanization, proliferation of slums are all contributing to the generation of increased volume of garbage. The improper management of the domestic waste pollutes the environment and caused threat to public health. Waste management practice needs concern not only for its increased generation but, also for its inadequate practices. This study has been undertaken with the objectives to assess the knowledge and practices on household waste management among the slum dwellers.* ***Methodology:*** *A quantitative descriptive survey design was adopted for the study. A total of 98 slum dwellers were selected by multistage sampling techniques, samples were drawn proportionately from 6 slums under Kamrup Metro, Assam. Data was collected using self-administered structured questionnaire and checklist. Data were analysed in terms of descriptive and inferential statistics by using SPSS 16.0 version.* ***Results:*** *The study found that majority 69(70.4%) of the respondents had average knowledge and maximum number of respondents 52(53.1%) had average level of practices on household waste management. The correlation between the knowledge and practices was found to be r= 0.132. Significant association was found between knowledge of slum dwellers with their gender (χ^2=6.497, df=2, p=0.039**)** and occupation (χ^2=16.125, df=6, p=0.013). The association of practices on household waste management was found significant with religion (χ^2=10.284**,** df 4, p=0.036) and income (χ^2=17.045, df =8, p=0.030) of the respondents.* ***Conclusion:*** *The study revealed that majority of the slum dwellers of Kamrup Metro, Assam had average level of knowledge and practices on household waste management. Awareness can be generated regarding the importance of proper household waste management by health education, distribution of pamphlet, etc. in order to improve their knowledge and practices. It can help lessen waste generation and improve waste management processes.*

Keywords: *Knowledge, Practices, Household Waste Management, Slum Dwellers.*

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I. Introduction

"Knowing is not enough; we must apply.
Willing is not enough; we must do."
Johann Wolfgang von Goethe, German poet (1749-1832)

We have to ensure a good health by keeping our house and surrounding clean. Waste has remained an inseparable part of the human society and environment to which man is continuously exposed (Roy R.N, Saha I, 2013)[1]. Improper management of waste leads to contamination of atmosphere, soil and water, thereby causing a major impact on public health in various ways (Rao K.S, 2000) [2]. Waste management is a global as well as national and local issue. It has now become basic human right which is a part of basic human needs. (UNEP, 2015).[3] Swachh Bharat Abhiyan led by the government of India aims to make India a clean nation, the focus was on cleaning the environment. It includes all the measures to be adopted by Indian public to assure healthy Indian citizen. Everyone is directly or indirectly involved to maintain and promote one's health. [4]

The Global Waste Management Goals are already explicit within the Sustainable Development Goals (SDGs). ISWA focus on developing countries to mobilize international aid, environmental and climate funds to assist the poorest countries by increasing the level of funding on waste management from 0.3% since 2000 to an

average of 3% of total international aid funding in the period from 2015 to 2030 (ISWA, 2012)[5]. Around the world, waste generation rates are rising. In 2012 the world's cities generated 1.3 billion tonnes of solid waste per year, amounting to 1.2 kg per person per day. With rapid population growth and urbanisation, municipal waste generation is expected to rise to 2.2 billion tonnes by 2025 (The World Bank, 2018)[6].

Urban India generated 31.6 million tonnes of waste in 2001, 47.3 million tonnes in 2011. By 2041 waste generation is predicted to be 161 million tonnes, a fivefold increase in four decades. More than 90% of waste in India is believed to be dumped in an unsatisfactory manner (Annepu R.K, 2012).[7] There had been a significant increase in solid waste generation in India over the years from 100 gram per person per day in small towns to 500 gram per person per day in large towns. (Hlawn D.H, Kaur G 2016).[8]

According to 2011 census, Kamrup Metropolitan has a population of 1,260,419 with density of 820/km^2. The city's 12.64% population are living in slums. The industrialisation of Guwahati city is apparently correlated to migration and increase in the number of slums in the city.[3] The total number of slums under the jurisdiction of the GMC has gone up to 217(GMC 2012) from 90 slums (GMC 2009).[9] The citizens are not aware of the health hazards associated with improper solid waste disposal and are not much concerned about the environment friendly disposal of garbage of their own household[10].

Home is the first place from where solid waste management can be initiated. It is the responsibility of each individual to dispose waste in the right way. While most people blame big industries for the poor disposal of waste, the truth is that even poor disposal of waste at the domestic level can hurt the environment. The quantity of solid waste generation by slum dwellers is one-third of people living in formal households on individual basis. There is need to improve knowledge and practice among the slum dwellers regarding household waste disposal. The consequence of negligence for solid waste service delivery to urban poor certainly creates several health problems to slum residents which ultimately add extra pressure on slum dwellers due to medical expenditure and other associated costs. Inclusion of urban poor within SWMS will certainly help them to keep their households and neighbourhood clean and will have positive impact on improving environmental health and financial condition.

Statement of the problem: A study to assess the Knowledge and Practices on Household Waste Management among the Slum Dwellers of Kamrup Metro, Assam.

Objectives of the study:

- To assess the Knowledge on Household Waste Management among the Slum Dwellers.
- To assess the Practices on Household Waste Management among the Slum Dwellers.
- To find out the relationship between Knowledge and Practices on Household Waste Management among the Slum Dwellers.
- To find out the association between Knowledge on Household Waste Management and the demographic variables.
- To find out the association between Practices on Household Waste Management and the demographic variables.

II. Methodology

Research design: A non-experimental, descriptive survey design was adopted for the study.

Study setting: The study was conducted in six randomly selected slum areas - Bhutnath Millannagar Dolki, Kahilipara Hill side, Laktokia Railway side, Manipuri Basti, Guwahati club and Islampur colony under Kamrup Metro,Assam.

Population: The accessible population were slum dwellers aged 18 years and above of selected six slums of Kamrup Metro, Assam, who fulfil the sampling criteria for the study.

Sample size: 98 slum dwellers.

Sampling technique: Multistage sampling technique was adopted for the study. Out of 60 wards of Kamrup Metro, Assam, the investigator had selected 10% of the total wards i.e. 6 wards (ward no. 11, 22,30,32,35, and 36) using lottery method. Then, 1 slum was selected randomly from each selected 6 wards. Proportionately 10% of the total households were taken from each selected slums for the study. And every 10th household were selected from each selected slums.

Inclusion Criteria:

- Slum dwellers aged 18 years and above.
- Slum dwellers who are be able to read and write English or Assamese.
- Both the gender.
- Slum dwellers who are willing to participate in the study.
- Slum dwellers who are available during the period of data collection.

Exclusion Criteria: Slum dwellers who cannot respond to the questionnaires by themselves due to physical or mental challenged.

Tools for data collection : The tools included were Socio-demographic data which consist of six items for obtaining information regarding the background variables i.e. age, gender, religion, educational status, occupational status , per capita monthly income of the family in Rs. of the respondents. A self-administered structured knowledge questionnaire on household waste management consists of 18 multiple choice questions and structured Practice checklists consists of 14 items.

Ethical consideration: Institutional Ethical clearance was obtained from Institutional Ethical Committee, Regional College of Nursing, Guwahati. Written permission was obtained from the Joint Director of Health Services, Kamrup Metro, Assam. Formal permission was obtained from Guwahati Municipal Corporation. Consent was taken from all the respondents for the study after explaining the purpose and procedure of the study. Slum dwellers were assured for the confidentiality of the data obtained.

Data collection procedure: After obtaining informed consent, structured questionnaire was administered to collect the data from the sample. The period of data collection was from 5th March 2018 to 21st April 2018. Time taken by each respondent to complete the tool was about 20 to 25 minutes. On average 8 to 10 households' data was collected per day.

Data analysis: Analysis and interpretation of data were based on the objectives and hypotheses of the study. The collected data were coded and organised in a master sheet and were analysed by using the SPSS 16.0 version. Using the formula Mean ± SD, the knowledge and practices score was calculated. The level of significance was set at 0.05 to interpret the findings. The data was summarised and arranged in a consisted and organized form of tables, charts and diagrams for correct analysis and meaning interpretation. Descriptions of demographic variables of samples were calculated in terms of frequency and percentage. The level of knowledge and practices were calculated in terms of frequency and percentage distribution, minimum score, maximum score, mean, and standard deviation**.** Karl Pearson's correlation coefficient (r) was used to find out the correlation between the knowledge and practices on household waste management of slum dwellers. Test of significance (chi-square) was adopted to determine the association between knowledge and practices of slum dweller on household waste management with selected demographic variables

III. Result

Table1 depicts that majority of the slum dwellers i.e. 32(32.7%) belonged to the age group of 18 -30 years, followed by 25(25.4%) between the age of 31-40 years, 23(23.5%) between 41 -50 years, 14(14.3%) between 51-60 years and 4(4.1%) belonged to > 60 years of age. Majority of the slum dwellers i.e. 57(58.2%) were female, and 41(41.8%) were male. 76 (77.6%) of the slum dwellers belonged to Hinduism, 21 (21.4%) belonged to Muslim, and only 1(1%) belonged to Christian religion. Regarding educational status 41(41.8%) had completed their education only up to primary school, followed by high school level by 34(34.7%), 19(19.4%) had their education up to higher secondary level, and 4 (4.1%) had completed graduation and above. Majority 44(44.9%) were daily wage earner, followed by 32(32.6%) unemployed, 18(18.4%) were private employee, and 4(4.1%) were government employee. 24(24.5%) of the slum dwellers had monthly per capita income of Rs.≥6,254, another 24(24.5%) of the slum dwellers had per capita income of Rs.1,876-Rs.3,126 followed by 21(21.4%) of Rs.3,127- Rs.6,253. 17(17.3%) of the slum dwellers had monthly per capita income of Rs.938-Rs. 1,875, and 12(12.3%) of Rs.<938.

Table 1: Frequency and percentage distribution of respondent's Socio-Demographic characteristics.

Variables	Frequency (f)	Percentage (%)
Age in years		
18-30	32	32.7
31-40	25	25.4
41-50	23	23.5
51-60	14	14.3
>60	4	4.1
Total	**98**	**100**
Gender		
Male	41	41.8
Female	57	58.2
Total	**98**	**100**
Religion		
Hinduism	76	77.6
Christian	1	1
Muslim	21	21.4
Others	0	0

Total	**98**	**100**
Educational status		
Primary School	41	41.8
High School	34	34.7
Higher Secondary	19	19.4
Graduate and above	4	4.1
Total	**98**	**100**
Occupation		
Unemployed	32	32.6
Daily wage earner	44	44.9
Private employee	18	18.4
Government employee	4	4.1
Total	**98**	**100**
Per capita monthly income in Rs.		
≥6,254	24	24.5
3,127-6,253	21	21.4
1,876-3,126	24	24.5
938-1,875	17	17.3
<938	12	12.3
Total	**98**	**100**

Fig. 1 shows that majority 69(70.4%) of the slum dwellers have average knowledge on household waste management, 21 (21.4%) have poor knowledge and 8(8.2%) have good knowledge on household waste management.

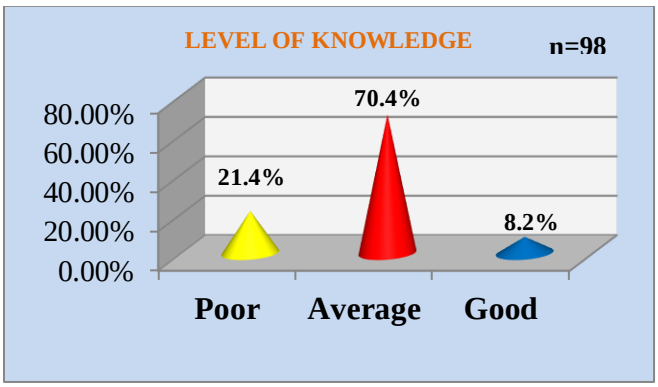

Fig 1: Diagram showing distribution of respondents according to their level of knowledge.

The data presented in the table 2 shows that the mean and standard deviation of overall knowledge were 7.54 and 2.99 respectively. Median was spotted at score 7. Minimum score for overall knowledge was 1 and maximum score was 15.

Table 2: Knowledge of respondents in terms of minimum **and maximum score, mean, median, and standard deviation.**

Knowledge	Minimum score	Maximum score	Mean	Median	Standard deviation
	1	15	7.54	7.00	2.99

Fig. 2: shows that majority i.e. 52(53.1%) of the slum dwellers had average level of practices on household waste management. 27(27.5%) had poor level of practices and 19(19.4%) had good practices on household waste management.

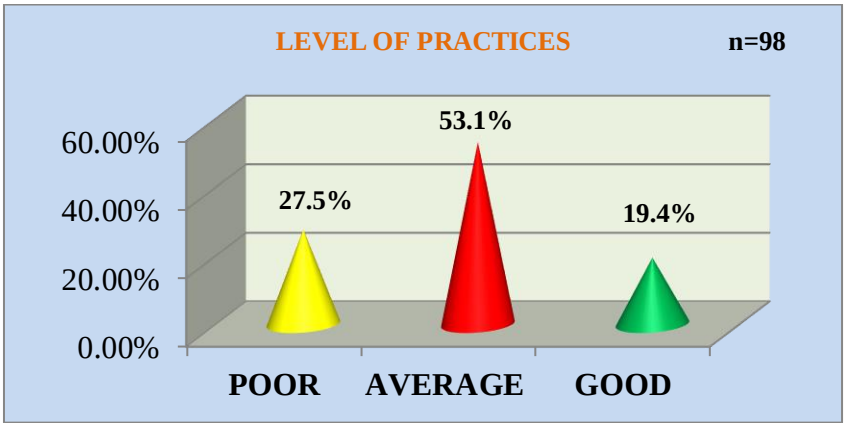

Fig. 2: Diagram showing distribution of respondents according to their level of practice on household waste management.

The data presented in table 3 shows that the mean and standard deviation of overall practice were 8.18 and 2.43 respectively. Median was spotted at score 8. Minimum score for overall practice was 1 and maximum was 13.

Table 3: Practices of respondents in terms of minimum and maximum score, mean, median, standard deviation.

Practices	Minimum score	Maximum score	Mean	Median	Standard deviation
	1	13	8.18	8.0	2.43

Table 4 shows the existence of positive correlation between knowledge and practices level on household waste management among slum dwellers. However, Karl Pearson's correlation coefficient was found to be r= 0.132 and p- value was found to be 0.194, which is statistically not significant at 0.05 level of significance.

Table 4: Correlation between knowledge scores and practice scores on household waste management.

Variables	Correlation (r)	P value	Remarks
Knowledge	0.132	0.194	NS
Practice			

NS: Not significant

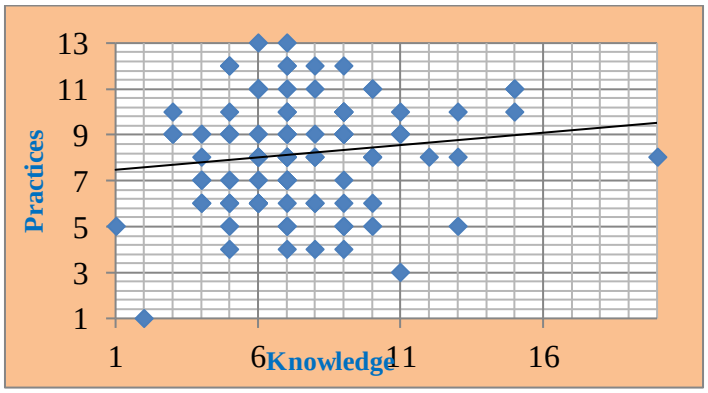

Fig. 3: Scattered diagram showing correlation between Knowledge and Practices on household waste management.

Table 5 shows that there is significant association between the knowledge on household waste management and selected demographic variables gender (χ^2 =6.497, p value=0.039) and occupation (χ^2 =16.125; p value=0.013), at (p<0.05) level of significance.

Table 5: **Association between knowledge on household waste management and the demographic variables.**

Variables	Level of Knowledge			Total	χ^2	df	p-value	Remark
	Poor	Average	Good					
Age in years								
18-30	5	25	2	32	10.127	8	0.256	NS
31-40	6	18	1	25				
41-50	5	15	3	23				
51-60	2	10	2	14				
>60	3	1	0	4				
Total	**21**	**69**	**8**	**98**				
Gender								
Male	5	30	6	41	6.497	2	0.039	S
Female	16	39	2	57				
Total	**21**	**69**	**8**	**98**				
Religion								
Hinduism	16	54	6	76	0.581	4	0.965	NS
Christian	0	1	0	1				
Muslim	5	14	2	21				
Others	0	0	0	0				
Total	**21**	**69**	**8**	**98**				
Educational Status								
Primary School	10	28	3	41	2.082	6	0.912	NS
High School	7	24	3	34				
Higher Secondary	4	13	2	19				
Graduate and above	0	4	0	4				
Total	**21**	**69**	**8**	**98**				

S=Significant **NS**=Not significant

Table 6 shows that there is significant association between the practices on household waste management and demographic variables religion (χ^2=10.284; p value=0.036) and per capita monthly income of the family (χ^2 =17.045;p value=0.030), at (p<0.05) level of significance.

Table 6: **Association between practices on household waste management and the Demographic variables.**

Variables	Level of practice			Total	χ^2	df	p-value	Remark
	Poor	Average	Good					
Age in years								
18-30	7	14	11	32	9.061	8	0.337	NS
31-40	8	15	2	25				
41-50	7	13	3	23				
51-60	3	8	3	14				
>60	2	2	0	4				
Total	**27**	**52**	**19**	**98**				

Gender								
Male	10	21	10	41	1.211	2	0.546	NS
Female	17	31	9	57				
Total	**27**	**52**	**19**	**98**				
Religion								
Hinduism	16	46	14	76	10.284	4	0.036	S
Christian	1	0	0	1				
Muslim	10	6	5	21				
Others	0	0	0	0				
Total	**27**	**52**	**19**	**98**				
Educational Status								
Primary School	13	22	6	41	6.113	6	0.411	NS
High School	10	15	9	34				
Higher Secondary	4	11	4	19				
Graduate and above	0	4	0	4				
Total	**27**	**52**	**19**	**98**				

S=Significant **NS**=Not significant

IV. Discussion

In this study which was done in selected slum areas of Kamrup, Metro found that majority i.e. 32(32.7%) of the respondents were between the age group 18-30 years. Most of the respondents 57(58.2%) were female and 76(77.6%) were from Hindu religion. Regarding educational status majority 41(41.8%) had completed their primary school and most of respondent 44 (44.9%) were daily wage earner. Majority of the respondent 24 (24.5%) were from monthly per capita income of Rs.≥ 6,254 and also another 24(24.54%) respondents were from Rs. 1,876- Rs.3,126. The findings of this study were supported by a study conducted by Adogu P.O.U., Uwakwe K.A., Egenti N.B., Okwuoha A.P. and Nkwocha, I.B. (2015)[11] on assessment of Waste Management Practices among Residents of Owerri Municipal Imo State Nigeria. The study showed that 43.9% (124) of the respondents were between the ages of 21 - 30 years, females were made up of 63.8% (180) of the respondents and 60.3% (170) had completed their tertiary education. Abhay S, Poonam N.R, Naik V G ,Prasad K ,Nagaraj (2014)[12] conducted a study on Solid Waste Disposal Practices in an Urban Slum Area of Nalgonda town, south India indicated that among 127 families majority of the subjects were Hindu by religion (92.9%), which is consistent with the present study. Another study conducted by Kiran K.G. ,Kini S , Ravi K. , Santhosh N.P. & Kiran N.U. (2015)[13] among 120 households of Kuttar and Manjanadi villages,Karnataka, found that majority 107 (89.2%) families belonged to class V socio-economic strata, 10(8.3%) belonged to class IV, 2(1.7%) families belonged to class III and 1(0.8%) belonged to class II Socio-economic strata. In consistent with the present study majority of the respondents had completed their Primary school i.e. 78 (65.0), and only 1 (0.8) had done the graduation.

The knowledge score in this study showed that majority 69(70.4%) of the slum dwellers had average level of knowledge; 21(21.4%) had poor knowledge and very minimal i.e. 8(8.2%) had good knowledge on household waste management. The mean and standard deviation of the total knowledge were found to be 7.54 and 2.99 respectively. Similar findings with the present study were observed in a descriptive quantitative study conducted by Sunarto S., Bisri M., Somerno, Suyadi (2014)[14] on Society Behaviour towards Household Waste Management among 270 housewives of 3 villages in Tulungagung, Indonesia which showed that knowledge and attitude on household waste management was at moderate level. The average value of knowledge variable was 3.12.

In the present study, majority 52(53.1%) of the slum dwellers had average practices level on household waste management, while 27(27.5%) had poor practices and only 19(19.4%) had good practices level. The mean and standard deviation of overall practices were found to be 8.18 and 2.43 respectively. A study conducted by John JV, Fernandes ST, Kuriakose S (2014)[15] to assess the knowledge and practice of housewives regarding domestic plastic waste management found out that among 300 housewives from selected areas of Mangalore, 75.1 % (225) had average level of practice, 24.9% (75) had poor practice and none of them had good practice. Singh M, Gurjar N (2017)[16] conducted a descriptive cross-sectional study to assess the knowledge, attitude, and

practices towards household waste management among 200 adolescents of 13 -18 years from secondary and higher secondary schools of Jaipur. The results showed that 105(52.5%) of the adolescents had unsatisfactory practices, 95(47.5%) adolescents had partial satisfactory practices and none of the adolescents had satisfactory practices.

The study shows that the correlation between the knowledge and practices on household waste management was found to be r = 0.132 and p- value = 0.194. So, the correlation between the knowledge and practices on household waste management was not significant at 0.05 level of significance. The findings of a cross sectional study conducted by Singh M, Gurjar N (2016)[16] on knowledge, attitude and practice of adolescents towards household waste management in selected secondary and senior secondary schools at Jaipur district of Rajasthan showed that the mean score of knowledge and practice of adolescents towards household waste management was 9.08 and 6.80 respectively and there was significant low positive correlation(r = 0.58, p= 0.01) between knowledge and practice of adolescents towards household waste management.

The findings the present study showed that there is significant association between the knowledge on household waste management and selected demographic variables gender (χ^2 =6.497, p value=0.039) and occupation (χ^2 =16.125; p value=0.013), at (p<0.05) level of significance. The study conducted by Ahmed M.N.Q, Moula G, Mojumadar SB(2017)[17] on Scrutinizing Domestic Garbage Disposal Techniques of Slum Dwellers on Slum Areas of Sylhet City of Bangladesh shows that females are significantly more aware of waste management than males (p = 0.025). Females are also significantly more knowledgeable than males about open dumping (p < 0.05) while males know more about composting (p < 0.05) and land filling (p < 0.05). The findings of the study done by Jatau A.A. (2013)**[18]** on Knowledge, Attitudes and Practices Associated with Waste Management in Jos South Metropolis, Plateau State found that level of education had statistical significant influence on knowledge and practices associated with waste management. Respondents with higher level of education possessed corrected level of knowledge of the impact of improper waste management on health than those with lower level of education.

There is significant association between the practices on household waste management and selected demographic variables religion (χ^2=10.284; p value=0.036) and per capita monthly income of the family (χ^2 =17.045;p value=0.030), at (p<0.05) level of significance. Ekere, W. J. Mugisha; and L. Drake (2009)[19] conducted a study on Factors Influencing Waste Separation and Utilization among Households in the Lake Victoria Crescent, Uganda. The results showed that gender is negatively and significantly related to solid waste separation at the 5% confidence level. The relationship between income and waste segregation is negative and significant at the 10% confidence level which is consistent with the present study finding. This implies that households with high incomes are less likely to engage in separating waste.

V. Conclusion

Implication of the study: Based on the findings of the present study an awareness programmes related to household waste management through various activities like role-play, street play, and health education can be done. The inclusions of content of household waste management in the curriculum are to be emphasized to enhance the knowledge of the students. A nurse administrator can organise and conduct staff development program to update the knowledge of nurses on household waste management to impart proper education and information to the community. Research on household waste management can involve interdisciplinary research teams and findings can be communicated, emphasis should be laid on publication of research findings.

Limitation: There was a limitation that practices could not be assessed by direct observation because of the time factor.

Recommendations: Educational programs on household waste management should be expanded through various media to keep the methods alive in the minds of the general people. This program might focus heavily on the benefit of health. The government should conduct IEC activities to aware the public all the measures, services and penalties related to waste management.

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