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Cover Page Footnote

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1. Introduction

Waste management may be an expensive endeavor if not carried out appropriately. A World Bank study (2009) evaluated that in most of the developing nations, 20-50 percent of urban expenditure budget is directed at management of solid waste. In the similar way, Dehradun, capital city of Uttarakhand goes through a huge amount of expenditure on waste management utilized to maintain landfill sites. Without a doubt, the tourism and hospitality activities heighten to the urban waste managing issue. In view of figuring by the World Bank, at present, India is the biggest producer of waste, owing to a great extent to the size of its population. As per 2016 estimate, India produces 277 million tons of urban solid waste annually. That is over 80 percent of the 334 million tons of waste produced in South Asia and around 13 percent of waste produced per year worldwide. Uttarakhand is the country's poorest carrying out state in connection with solid waste management. It produces 1406 tons of solid waste per day and process 0 percentage of it (Rawat M. Hindustan Times, 10th March, 2018). City officials in different areas of the city have been struggling with the issue of gathering loads of waste. Moreover, the shortage of landfill areas has also exacerbated the problem.

The rising studies on green activities of hotel has demonstrated that bigger and luxury hotels are at the lead of green practices (Behera, 2020; Behera, 2018a, b; Mensah, 2014, 2020; Erdogan, and Tosun, 2009; Bohdanowicz, 2005; Burgos-Alvarez-Gil, Jimenez, and Cespedes-Lorente, 2001; Kirk, 1995). Furthermore, hotels' waste management studies have focused on food waste which is unquestionably the major waste caused by hotels. Moreover, house hold waste and local waste management programme are highlighted by most of the studies while small hotels' wastes are neglected (Radwan, Jones, and Minoli, 2010). In an investigation into the hotel industry in Oaxaca (Mexico) by Sánchez-Medina and others (2016), it was found that bigger hotels found it simpler than smaller ones to adopt sustainable management activities. As per Kasim (2009), this is on the grounds that small and medium enterprises (SMEs) don't have adequate assets in contrast to bigger organizations. Hoogendoorn et al. (2015) also stated the deficiency of time and space as a major cause why small hotels' experience on various difficulties in handling waste. It is in contradiction of this backdrop that this analysis aims to investigate waste management practices of small hotels in Dehradun.

Though there were few research on hotel's waste management, maximum of the research has targeted on figuring out the volume of waste generated by hotels (Ball and Taleb, 2011). Based on the waste management hierarchy (WMH) model, the purpose of waste management is to lessen the quantity of waste disposed at the landfill sites. However, the volume of waste produced can only be minimalized if

hotels adopt sensible waste management practices. However, it seems small hotels and guest houses normally lack the resources and managerial knowledge on waste management. Small hotels that for the purpose of this study are hotels categorized as budget, guest house or 1–2-star hotels and which do not have more than fifty rooms account for the majority of the hotels in Dehradun. As per Uttarakhand Tourism Development Board Office, there has been a proliferation of small hotels in different parts of the city in response to a growing demand by the tourists and guests who throng the city. Though, the waste generated by individual small hotels units are normally minimum as compared to that of large hotels, the cumulative effect of the waste generated by the growing number of small hotels could be catastrophic on the environment. (Mensah, 2006).

Although waste management studies are not new, most of the studies have concentrated on the perspective of large hotels. However, there are few studies that look at the perspectives of small hotels. As a result, the goal of this study is to fill in the gaps indicated above in the context of Dehradun by examining how waste management practices are performed in small hotels of Dehradun. Therefore, the objective of this study is to investigate various waste management practices of small hotels in Dehradun, the capital city Uttarakhand state of India. The following is how the rest of the paper is structured: Section 2 explains about the research design. The results and discussions are presented in Section 3. The study's conclusion is presented in Section 4 and section 5 illustrates the limitation and future research of the study.

2. Materials and Methods

2.1. Study Area and Design

The analysis was done in small hotels of Dehradun, the capital city of Uttarakhand State of India. The number of hotels has risen rapidly in Dehradun because of expansion in business enterprises and visitor landings. As the goal of the study was to explain the present condition of waste management activities by small hotels, a descriptive and cross-sectional method was used. As a primary data base, a cross-sectional analysis was utilized to gather data from a group of hotel managers. For data collection and analysis, quantitative methods were used in view of the positivist paradigm.

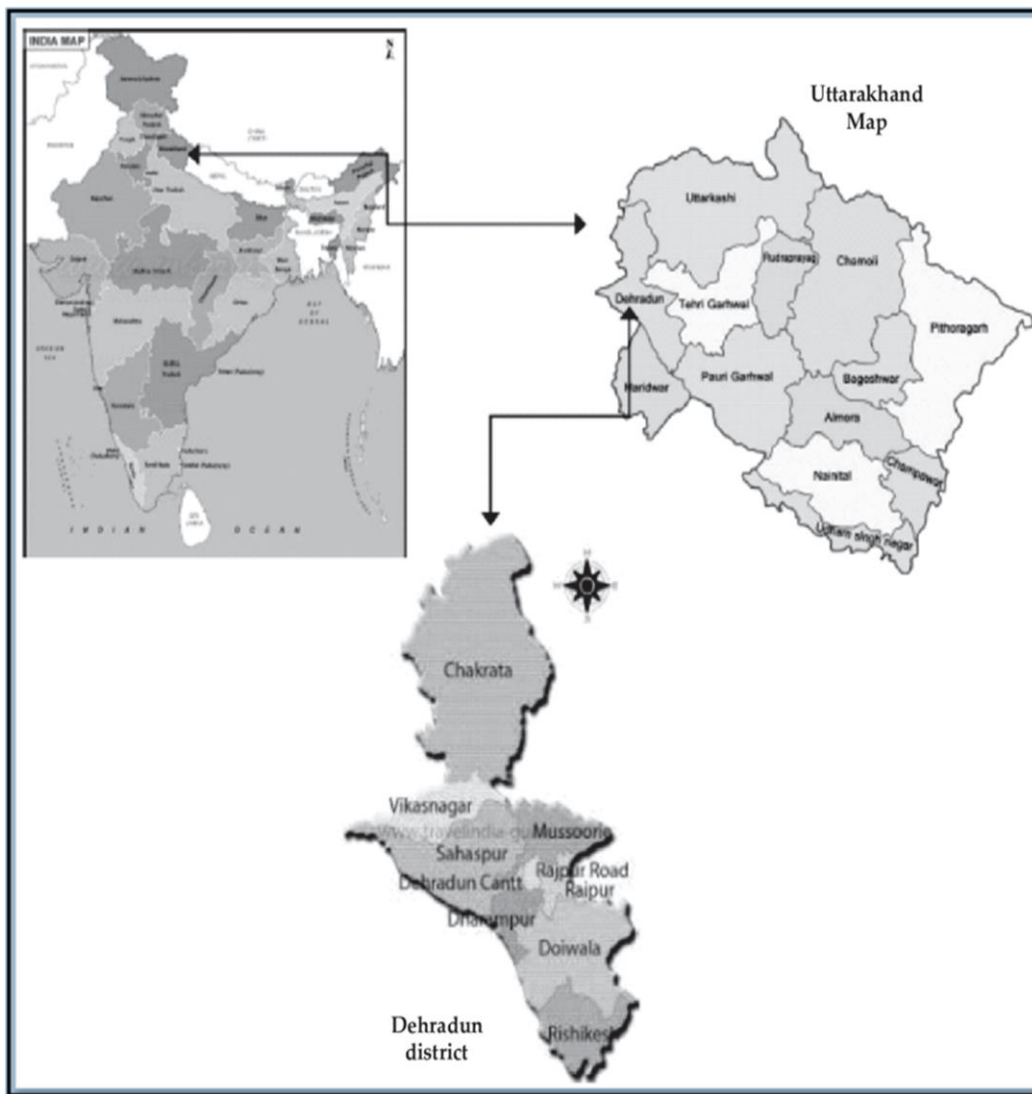


Figure 1: Dehradun Map

2.2. Instrument

Data was gathered utilizing self-administered structured questionnaire. The survey paper included close-ended questions pertaining to waste management practices by small hotels, hotel characteristics and socio-demographic profile of hotel manager. To measure the frequency at which hotels have carried out, different waste management practices, a frequency rating scale ranging from never to regular habit is employed.

2.3. Population and Sample

The sample consisted of all managers of small hotels (budget hotels, guest houses, and 1-2-star hotels with a limit of 50 rooms) in the city. There is no agreement with respect to what a small hotel comprises. For example, Avelini-Holjevac and Vrtodusic (1999) argued that small hotels normally have in the range of 40 and 70 rooms whereas Milohnic (2006) categorized 5-50 room hotels as small hotels. As parameters for the determination of small hotels, both quantitative (not in excess of 50 rooms) and qualitative (not exceeding 2-star rating) indicators were utilized as the basis of this analysis. A list of 176 hotels which fall under class of the small hotels was assembled from DMC (Dehradun Municipal Corporation)'s 2019 list of registered hotels and utilized as a sampling structure.

This paper used the technique of probability sampling. To begin, a sample size of 130 was chosen using the Raosoft sample size calculator (Raosoft, 2004) with a population of 176; a 5 percent margin of error, a 95 percent confident interval, and a 50 percent sample share. While this provides a sample of 121, 9 have been included to provide for probable unanswered questionnaire resulting in a sample of 121. Random numbers have been utilized to choose the hotel from the list until all 121 hotels were chosen. Following the selection of the hotel, the senior manager was approached to help in a data collection survey. The collection of data continued for nearly 120 days, from 15th December, 2019 to 15th March, 2020. Investigators made phone calls to the hotels to achieve a better response rate.

2.4. Data Collection Processes and Analysis

A pre-test had been attempted at 10 small hotels in Dehradun. The pre-test was carried out based on Czaja's (1998) recommendation to resolve concerns related to four crucial subjects such as awareness of respondent, problems of questionnaire, investigators' responsibilities, and problem, interest, sampling, and coding analysis. The pretest took an undeclared format, a condition in which the survey was carried out in a similar way as the primary survey planned. The significant concerns related to the questionnaire during the pre-test might be unexhausted answer sets and the lack of comprehension of some of the questions by respondents because they were not appropriately worded. Then the questionnaire was successively improved based on input from the pre-test. The actual data gathering was carried out. For data analysis, SPSS 22 was employed to code data and calculate descriptive and inferential statistics. Descriptive statistics such as frequency percentage have been applied to evaluate and present the results.

Cross tabulations were also used to create a contingency table for two categorical variables. The chi-square test for independence was used to ascertain whether there is a significant relationship between different categories of small hotels and their implemented waste management practices. The significance level chosen for the two-tailed chi-square test was 0.05. The cross-tabulation analysis

also included the correlation value to measure the level of correlation between two categorical variables. For example, chi-square and contingency tables were used to study patients' differential responses with different psychiatric diagnoses to a given rehabilitation programme (Bhat, 1996). So, the hypothesis was

H0: There is no difference between waste management practices of various categories of small hotels in Dehradun.

H1: There exists a difference between waste management practices of various categories of small hotels in Dehradun.

3. Result and Discussion

3.1. Socio-Demographic Profiles of Hotel Managers

In the hotel industry, the crucial job of managers should not be ignored. In this survey, small hotel managers were the respondents. According to table 1, the majority of managers (76.9 percent) were men, while 23.1 percent were women. They were mostly Indians (96.7 percent), and the majority of them were between the ages of 21 and 39 (57.9 percent), followed by those between the ages of 40 and 59 (27.3 percent), indicating that the managers were relatively very young. In terms of education, they had largely completed secondary or technical programme (38.8 percent) as well as degree programme (31.4 percent). In addition, 22.3 percent and 2.5 percent had completed college and post-graduate studies, respectively. They were primarily Hindu (76.9 percent). The majority of the managers (89.3) were married while only 6.6 percent were single.

Table 1: Socio-Demographic Profiles of Managers

Characteristics	Frequency (%)
Gender	
Male	93 (76.9)
Female	28 (23.1)
Age	
≤20	8(6.6)
21-39	55 (57.9)
40-59	48 (27.3)
60≥	10(8.3)
Education	
Primary	6 (5.0)
High School	47 (38.8)
Training college	27(22.3)
Undergraduate	38(31.4)
Postgraduate	3 (2.5)
Religion	
Hindu	93 (76.9)
Muslim	21 (17.4)
Other	7 (5.8)
Marital status	
Single	8 (6.6)
Married	108 (89.3)
Separated	2 (1.7)
Widowed	3(2.5)
Nationality	
Indian	117 (96.7)
Other	4 (3.3)

Source: Field survey data, 2019-2020

3.2. Characteristics of Small Hotels

Table 2 shows that more than half of the hotels in Dehradun (68.6 percent) are budget hotels. 19.0 percent are guest house and 10.7 percent are 2-star hotels. Only 1.7 percent of the hotels are 1-star. Only 1.7 percent of the hotels were members of Federation of Hotel and Restaurant Association of India and Indian Hotel Association (FHRAI&IHA). Furthermore, the majority of hotels (91.7) percent were unaffiliated with any foreign multinational corporation. They have been predominately self-guided by their own properties' owner (83.5) and management contracts on their own (7.4 percent). Only 5.8 percent of the hotels had a manager appointed by the owner/board and 3.3 percent had a franchise agreement. The management contracts were mostly taken up by local hotel management

organisation rather than global brands. In terms of business structure, the hotels were mostly sole proprietorship (62 percent) which are common among small businesses. The hotel size was also apparent from the number of rooms and staffs. The majority of hotels comprised of 31 to 40 rooms (45.5 percent). There were 15.7 percent of hotels in between 41-50 rooms. As the number of staff, 45.5 percent had between 1-10 workers.

Table 2: Characters of the Small Hotels

Characteristics	Frequency (%)
Class of hotel	
Budget	83 (68.6)
Guest House	23 (19.0)
1-star	2 (1.7)
2-star	13 (10.7)
Affiliation to foreign MNC	
Affiliated	17 (14.0)
Not affiliated	104 (86.0)
Membership of FHRAI and IHA	
Member	2 (1.7)
Non-member	119 (98.3)
Management arrangement	
Self-managed by owner	101 (83.5)
Franchise agreement	4 (3.3)
Management contract	9 (7.4)
Manager appointed by owner/board	7 (5.8)
Ownership	
Local sole proprietor	75 (62.0)
Local partnership	27 (22.3)
Local and foreign partnership	9(7.4)
Local limited liability company	8(6.6)
Complete foreign ownership	2 (1.7)
Number of Rooms	
1-20	17 (14.0)
21-30	30(24.8)
31-40	55 (45.5)
41-50	19 (15.7)
Number of Employees	
1-10	55 (45.5)
11-20	44 (36.4)
21-30	22 (18.2)

Source: Field survey data, 2019-2020.

3.3: Waste Management Practices of Small Hotels

All the small hotels in Dehradun had various strategy on waste management practices (Table 3). For prevention of waste, 46.3 percent of small-hotels had a regular habit of buying from nearby market. But, for preventing waste, 41.3 percent of small had rarely bought recyclable product, while 43.8 percent of small hotels do not teach consumers on waste management practices whereas 48.8 percent of small hotels rarely train their worker regarding waste management practices and 41.3 percent of small hotels rarely bought from suppliers who are environmentally friendly. For reducing waste, 45.5 percent of small hotels had a regular habit of using machines and goods that are energy-efficient while 47.1 percent of small hotels had a regular habit of using crockery that is not dispensable. But, 48.8 percent of small hotels rarely used detergents and devices that are eco- friendly. On the other hand, to reduce waste, 35.5 percent of small hotels had a regular habit of installing showers, taps and other devices that are water-efficient while 45.5 percent of small hotels had a regular habit of buying in bulk to diminish the requirement for packaging. To reduce waste further, 42.1 percent of small hotels had a regular habit of utilizing returnable containers while 43.8 percent had a regular habit of accepting supplies in reusable dishes but 52.9 percent of small hotel sometimes printed both side of the paper. For reuse of waste, 42.1 percent of small hotels had regular habit of reused papers, cases, containers, jars and plastic products, while 39.7 percent of small hotels had regular habit of using of reusable bags for buying. Furthermore, 43.0 percent of small hotels had regular habit of fixing damaged equipment rather than buying a new one, while 41.3 percent of small hotels had regular habit of giving their leftover food to charity, but 43.0 percent of small hotels frequently ask their guests to reuse towel and clothing. Also, 45.5 percent of small hotels sometimes utilized waste water for watering plant while 35.5 percent of small hotels frequently install reusable soap dispensers for reuse of waste.

Table 3: Summary of Waste Management Practices

Waste Management Practice	RH	F	ST	R	N	Chi-Square
Prevention						
a) Buying from nearby market	46.3	37.2	10.7	5.0	0.8	6.667
b) Buying recyclable products	5.0	15.7	28.1	41.3	9.9	10.762
c) Teaching consumers on waste management practices	1.7	6.6	17.4	30.6	43.8	16.950
d) Training workers on waste management practices	5.8	9.1	23.1	48.8	13.2	21.246*
e) Buying from suppliers who are environmentally friendly.	6.6	11.6	24.8	41.3	15.7	15.678
Reduction						
a) Using machines and goods that are energy-efficient	45.5	39.7	9.1	4.1	1.7	11.776
b) Utilizing crockery that is not dispensable	47.1	39.7	7.4	3.3	2.5	9.361
c) Using detergents and devices that are eco- friendly	8.3	13.2	27.3	48.8	2.5	4.920
d) Installing showers, taps and other devices that are water-efficient	35.5	31.4	20.7	8.3	4.1	9.958
e) Buying in bulk to diminish the requirement for packaging	45.5	26.4	14.9	10.7	2.5	10.136
f) Utilizing returnable containers	42.1	32.2	13.2	7.4	5.0	24.817*
g) Acceptance of supplies in reusable dishes	43.8	28.1	17.4	8.3	2.5	7.738
h) Printing both side of the paper	24.8	15.7	52.9	4.1	2.5	6.574
Reuse						
a) Papers, cases, containers, jars and plastic products are reused	42.1	24.0	16.5	11.6	5.8	7.882
b) Usage of reusable bags for buying	39.7	28.9	18.0	8.3	5.0	7.987
c) Fixing damaged equipment rather than buying a one new	43.0	27.3	19.8	6.6	3.3	13.011
d) Giving leftover food to charity	41.3	31.4	18.2	5.8	3.3	10.205
e) Asking guests to reuse towel and clothing	25.6	43.0	12.4	12.4	6.6	8.670
f) Utilizing waste water for watering plant	19.8	14.0	45.5	12.4	8.3	16.617
g) Installation of reusable soap dispensers	25.6	35.5	12.4	16.5	9.9	11.288
Recycling						
a) Producing handouts and ads on recycled paper	3.3	8.3	14.9	27.3	46.3	7.501
b) Making use of recycled items	5.0	14.0	19.8	38.0	23.1	4.598
c) Recycling waste water for different uses	10.7	9.9	17.4	26.4	35.5	8.202
d) Employing a recycling programme	9.1	11.6	22.3	38.8	18.2	17.036
e) Segregation of waste into paper, glass, etc.	7.4	12.4	25.6	33.9	20.7	19.296* **
f) Sending waste to a plant for recycling	2.5	9.1	21.5	36.4	30.6	9.478
Recovery						
a) Composting for organic waste	13.2	19.0	20.7	18.2	28.9	6.103
b) Foundation of a plant for bio gas	11.6	14.9	16.5	19.8	37.2	7.490
c) Construction of a Sewage Treatment Plant	9.1	13.2	9.1	39.7	28.9	5.937
Disposal						
a) Provision of dustbins for landfill waste storage and disposal.	50.4	41.3	5.8	1.7	0.8	13.707
b) Waste collection and dumping by waste management company	43.8	28.9	16.5	8.3	2.5	13.081

Source: Field survey data, 2019-2020.

Note: Measured on a Five-point Likert scale: (RH= Regular Habit, F= Frequently, ST= Sometimes, R= Rarely, N= Never (%)) *p<0.05, **p<0.01, ***p<0.10.

On recycling of waste, 46.3 percent of small hotels is not producing handouts and ads on recycled paper while 38.0 percent of small hotel had rarely made use of recycled items. Similarly, 35.5 do not use recycling waste water for different uses while 38.8 percent of small hotel rarely employ a recycling programme. Besides 33.9 percent of small hotels rarely segregate waste into paper, glass, etc., while 36.4 percent of small hotels rarely send their waste to a plant for recycling. For recovery of waste, 28.9 percent of small hotels never compost their waste for organic manure while 37.2 percent never construct plant for bio gas and 39.7 percent of small hotels had rarely construct sewage treatment plant. For disposal of waste, 50.4 percent of small hotels has a regular habit of provision of dustbins for landfill waste storage and disposal while 43.8 percent frequently engage themselves in waste collection and dumping by waste management company.

The chi-square results revealed the relationship of different categories of small hotels and their waste management practices. According to the chi-square results, all waste management activities are statistically insignificant (accepting H₀) except training workers on waste management practices for prevention of waste, utilizing returnable containers for reduction of waste and segregation of waste into paper, glass, etc. for recycling of waste. The study's key findings are that there were no statistically significant differences found in implementation of waste management practices among various categories of small hotels. In other words, regardless of different categories among small hotels, waste management practices are mostly same.

4. Conclusion and Policy Recommendation

The above findings state that small hotels require more resources to manage their waste. This is demonstrated from the rarely and never practices of recycling and recovery of waste. These methods need huge quantity of investment to carry out the practices such as the expenditure of transferring waste to recycling plant, construction of recycling plant, obtaining of extra dustbins for waste segregation, and the acquisition of composter, biogas plant, and sewage treatment plants. These expenditures could be substantial for the small hotels and have an impact on their profit. In these situation, small hotels mostly favor disposal of their waste rather than recycling and recovery of the waste. Though there have been several studies on waste management in hotels in general, small hotels which normally lack the resources to implement effective waste management have not been particularly well studied. The findings of this study show that most of the small hotels are continuing to do waste disposal because it is the most convenient and cost-effective for them. Small hotels will continue to explore cost-cutting waste management methods that don not require any financial commitment and investment until some type of support is provided. This explains why most of the small hotels had the regular

habit of using different practices of waste reduction and waste prevention after waste disposal.

The fact that waste disposal is the most popular choice which has consequence for the waste management in the city of Dehradun. Already city officials are dealing with growing problem of waste in various part of the city, which is getting increasingly problematic and costly to handle. The situation is exacerbated by waste from the expanding number of small hotels that often wind up in landfills. The tons of waste created by these hotels in together could be significant since a tourist generates more than one kilogram of garbage every day (IHEI, 2022). However, if hotels adopt waste management practices aimed at the reuse and recycling of waste that has already been created, as well as the recovery of energy from such garbage, the volume of waste generated might be significantly decreased. Small hotels, on the other hand, are dearth of the capitals essential for waste recycling and recovery. As a result, hotel management and governing agencies must encourage attitudinal change among both the staff and visitors by accepting sufficiency approach rather than the efficiency approach. The sufficient strategy to resolve green issues entails behavioral change as a consequence of favorably prompting individuals such as visitors and employees to reduce personal consumption. Since these hotels lack the resources to purchase the required equipment and technology to perform their waste management activities, behavioral changes that promote waste prevention and reduction can assist lower the volume of end-of-pipe waste. It is amazing that linen reuse programme is so rare, yet it's a great way for hotels to cut liquid waste and save money. Results of the study also underscore the need for the Hotel Association of Dehradun. Around seventy-five percent of the hotels have been members to amalgamate the funds of its affiliates in joint waste management projects, i.e., setting up of recycling or bio-digester plant. The training programme may be organized with the help of the Hotel and Restaurant Association of Northern India (HRANI) and the Environmental Protection Agency on waste management for hotel managers.

5. Limitations and Future Research

There were certain limitations to this study which should be taken into account in future research. To begin, self-administered questionnaires were used to determine hotels' waste management practices. As a result, hotel managers self-reported waste management techniques. Therefore, it is possible that some hotel managers' response doesn't always represent reality on the ground. The data gathering method was particularly complicated by the fact that the hotels were not concentrated in one region but were dispersed around the city and some of the randomly selected hotel managers refused to participate in this study. Before substituting alternative hotels, researcher had to make phone calls to such hotels many times. Despite the fact that the study was about waste management in general, the focus was on solid

waste. So, the management of the gaseous and liquid waste of hotels has not been fully investigated.

Though, this study has provided evidence on the waste management practices of small hotels in Dehradun, it falls short of uncovering the reasons for managers' inactivity in implementing waste management practices in the areas of recycling and recovery, as well as the popularity of the waste disposal method. So, future research should aim to learn more about the causes for hotel waste management strategies and the motivation of hotel managers. In addition, future research should take a qualitative and observational approach to uncover waste management practices of small hotels and constraints they faced while implementing in their hotels. It would also be beneficial to assess the situation from the perspective of other stakeholders such as hotel guests, city officials, waste management companies, regulatory agencies and other service providers because successful waste management by small hotels necessitate the collaboration of all stakeholders.

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