Sustainable Urban Waste Management: A Policy Analysis of Swachh Bharat Mission in Surat, India

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Abstract:
The Swachh Bharat Mission, launched in 2014, aims to improve sanitation and waste management across India. This study evaluates its effectiveness in Surat, Gujarat, focusing on household participation in waste segregation. A survey of 375 respondents using an 18-question scale identified four key factors influencing the mission's success: government and community involvement, hygiene and quality of life, awareness and adoption, and infrastructure. The findings suggest that the mission has positively impacted waste management practices in Surat, with structured collection mechanisms and policy support driving improvements. However, challenges persist, including inadequate disposal infrastructure, inconsistent public awareness, and resistance to behavioural change. While metropolitan areas have adopted better waste management techniques, semi-urban and high-density areas still face issues like unauthorized dumping and inefficient waste handling. Local government bodies should focus on these critical determinants to enhance the mission's effectiveness and address ongoing challenges in waste management.

Introduction:

The Swachh Bharat Campaign (SBC), launched by the Indian government in 2014, aims to promote cleanliness and improved sanitation across India. This initiative aligns closely with the United Nations Sustainable Development Goal (SDG) 11: Sustainable Cities and Communities, particularly target 11.6, which seeks to reduce the adverse environmental impact of cities by focusing on air quality and municipal waste management.

In the context of rapidly urbanizing areas like Surat in the western state of Gujarat in India, effective waste management is crucial for sustainable development. This research examines how the SBC has influenced households in Surat to adopt waste segregation practices, a key component in improving urban waste disposal systems and promoting environmental sustainability.

By focusing on dry and wet waste segregation at the household level, this study contributes to the broader goal of creating sustainable cities. Proper waste segregation facilitates recycling, reduces landfill usage, and minimizes environmental pollution, all of which are essential for achieving SDG 11. Additionally, this research provides insights into the effectiveness of national policies in promoting sustainable urban practices at the local level, offering valuable lessons for similar initiatives in other developing urban centers.

The study's findings on community participation, challenges faced by residents, and the campaign's impact on waste management practices in Surat will provide crucial data for policymakers and urban planners. This information can guide future strategies to enhance the effectiveness of waste management programs, ultimately contributing to the creation of more sustainable and livable urban environments in line with global sustainable development objectives.

Review of Literature:

The Swachh Bharat Mission (SBM) is one of India's most prominent national initiatives for improving sanitation and waste management. The goals of this mission are to improve solid waste management (SWM) in both urban and rural areas, promoting environmental sustainability and public health of individuals. Since it began, there have been several studies that have aimed at examining the effectiveness of wet and dry waste collection.

Firstly, the SBM Phase II aimed to improve sanitation and cleanliness in the rural side of India by 2024-2025. According to studies, SBM has encouraged several waste reduction strategies, recycling initiatives, and the implementation of Internet of Things (IoT)-based smart waste collection systems (Anand & Devi, 2023). These advancements have contributed to a more structured waste collection process, with many urban municipalities adopting door-to-door waste collection mechanisms (Andres, 2020). However, in spite of these initiatives there are several challenges that are faced in the implementation, which leads to reduced effectiveness of this mission. A substantial amount of waste remains uncollected, particularly in smaller cities and towns, leading to environmental hazards and public health risks (Kumar & Chakrabarti, 2010). While SBM has made significant efforts in promoting organized waste collection, progress has been slow, especially in densely populated slums and high-traffic urban areas (Kumar & Chakrabarti, 2010). Additionally, while metropolitan cities have implemented more sophisticated waste segregation and disposal techniques, smaller municipalities struggle with inadequate infrastructure and financial constraints (Economic Survey, 2019).

In rural India, the SBM (Gramin) has played a crucial role in advancing solid and liquid waste management (SLWM). By promoting hygiene and cleanliness, SBM has demonstrated the potential of community-led initiatives in improving waste disposal practices (Basak et al., 2024). Some regions, like Sikkim, have successfully implemented decentralized waste management policies, allowing local self-governments to take charge of household waste collection and segregation (Indira, 2024). Nonetheless, the rural waste management struggles to achieve effectiveness because of lack of education and public awareness. Traditional disposal methods, such as open dumping and burning, remain prevalent due to limited infrastructure and public awareness (Sprouse et al., 2024). Additionally, SBM's focus has been more pronounced in urban areas, leaving rural waste management comparatively underdeveloped (Kalra et al., 2022).

Furthermore, the current technological advancements have played a large role in the implementation of SMB, particularly, the IoT-based waste monitoring systems and smart waste segregation techniques. The integration of these technologies has improved accountability and efficiency in waste collection processes, ensuring better segregation of wet and dry waste. However, the adoption of these technologies remains limited to a few urban centers, requiring broader implementation and greater government support to maximize their benefits (Andres, 2020). Adding on, digital platforms and mobile applications like the Swachhata App and SBM Urban App have been used to facilitate community involvement. These tools have enabled real-time tracking of waste collection vehicles and reporting of uncollected garbage, leading to improved responsiveness from municipal authorities (Suthar et al., 2019). Despite these advancements, the financial and infrastructural constraints affect adoption in rural areas.

To add on, community engagement and behavioral change plays a crucial role in determining SBM's success. The mission has employed financial incentives and community-led sanitation approaches to encourage responsible waste management practices (Andres, 2020).

Campaigns emphasizing behavioral transformation have played a vital role in promoting waste segregation and discouraging littering and open defecation (Kalra et al., 2022). Nonetheless, deep-rooted cultural beliefs and personal habits remain significant barriers, particularly in rural areas where traditional waste disposal methods persist (Sprouse et al., 2024). Many communities still lack adequate knowledge about the environmental and health impacts of improper waste management, making sustained behavioral change a challenge (Year End Review 2023: Achievement of the Department of Land Resources, 2023). To make a larger shift in disposable methods, the government should make investment in educational programs and awareness campaigns.

Based on the literature reviewed, no studies were found for evaluating the effectiveness of the SBM in the Surat urban region. No studies were found on waste collection mechanisms or waste segregation practices in Surat. There was no information on the technological adoption in terms of whether the smart waste segregation techniques were used. There is lack of focused studies on the role of community engagement in the implementation of waste segregation. There is absence of studies on city specific challenges with respect to Surat in the literature available. Owing to these gaps, the present study becomes relevant as it has tried to explore the pertinent factors leading to the success of the SBM in Surat.

Research Methodology:

To study the behaviour of Surat residents on SBM, with particular emphasis on the dry and wet waste segregation descriptive research design was used. The objective of the study was to examine the effectiveness of the policy 'Swachh Bharat Mission' implemented by the government of India in the city of Surat, by examining the different variables that were identified from the review of literature. An 18-question scale was designed for the study, and it was fielded through google forms. The data of 375 respondents from Surat city was collected using convenience sampling. The sample consisted of 150 females and 222

males and 3 persons who preferred not to state their gender. Postgraduates comprised of 46.4 percentage of the sample and 45.6 percentage were graduates. The remaining had completed secondary education. 40 percent of the respondents were between the age group of 18 to 25 years, four percent between 26 to 35 years, 25.6 percent were between the age group of 36 to 45 years, 18.4 percent were between the ages of 46 to 55, 5.6 percent were above the age of 55 and 6.4 percent were below the age of 18. 46.4 percent respondents lived in a household of 3-4 members, 34.4 percent of respondents had household sizes of 5 to 6 members, 18.4 percent of the respondents had household size of more than 6 members and 0.8 percent respondents came from single or 2 member households. It can be said that most of the respondents were part of medium to large families. Factor Analysis was carried out to identify the factors responsible for the acceptance of the SBM in Surat using Principal component analysis. The 18 statements were reduced to 4 factors in order of their importance. The descriptive statistics for the statements are given in Table 1:

Table 1: Variables used in the study-Means and Standard Deviation

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
Within the Swachh Bharat Mission, the waste management was promoted effectively in my area through various media channels like television, radio, and social media.	3.98	.963	375
I have a clear understanding of the Swachh Bharat Mission's objectives (achieving open defecation-free status, waste management, and promoting a cleaner India)	4.09	1.078	375
The wet and dry waste segregation of Swachh Bharat Mission has made a noticeable impact on improving cleanliness and sanitation in my community.	3.89	1.057	375
The implementation of waste management in Swachh Bharat Mission was effective in my area, with visible infrastructure improvements and community engagement.	3.75	1.045	375
There were sufficient resources allocated in my area for waste segregation	3.54	1.082	375
The Swachh Bharat Mission faced challenges in my area due to limited public participation, especially in rural regions.	3.49	1.126	375
Inadequate infrastructure, such as lack of proper waste collection presented a significant challenge to the Swachh Bharat Mission in densely populated areas	3.44	1.066	375
The Swachh Bharat Mission encountered issues with improper waste management, including littering, unauthorized dumping, and insufficient waste segregation.	3.63	1.096	375
I have personally adopted more hygienic practices, such as segregating waste, and handwashing with soap, due to the Swachh Bharat Mission.	4.12	1.052	375
My community is now more aware of the importance of cleanliness, with a stronger understanding of the impacts of littering and open defecation.	4.06	.978	375
The segregation of waste in Swachh Bharat Mission has created a lasting positive change in my community's cleanliness and sanitation practices.	3.93	.993	375
Sustainable waste management practices, such as composting, recycling, and reducing plastic use, have been successfully promoted in my community through the Swachh Bharat Mission.	3.87	1.092	375
Government policies related to waste segregation in Swachh Bharat Mission provided a clear framework and ensured accountability for its implementation.	3.73	1.027	375

The government has offered sufficient support to local communities for waste management, including financial aid, technical guidance, and capacity building.	3.70	1.016	375
The government effectively addressed challenges in the waste management of Swachh Bharat Mission by improving regulations, infrastructure, and fostering public-private partnerships.	3.72	1.044	375
Overall, I believe the Swachh Bharat Mission has been successful in improving sanitation and cleanliness in India.	3.51	1.274	375
The Swachh Bharat Mission has contributed to a better quality of life in my community.	3.50	1.389	375
I am confident that the Swachh Bharat Mission will leave a lasting legacy of cleanliness and hygiene in India.	3.72	1.440	375

Data Analysis:
SPSS version 26 licenced to the Veer Narmad South Gujarat University was used for the analysis. Exploratory Factor analysis was carried out using the Data reduction feature in SPSS.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.826
Bartlett's Test of Sphericity	Approx. Chi-Square	1327.85
	df	153
	Sig.	<.001

Table 2 displays the results for interpreting the adequacy of data for factor analysis. Kaiser-Meyer-Olkin (KMO) is a measure of sampling adequacy and its value should be greater than 0.6 for a sample to be adequate for undertaking factor analysis. Also, the p-value of Bartlett's Test of sphericity should be less than 0.05. Here, the value of KMO Test is 0.826 (greater than 0.6) and the p-value of Bartlett's Test is less than 0.001 (less than 0.05), which indicates that there are substantial correlations between variables. Hence, it can be inferred that factor analysis can be undertaken using this data set.
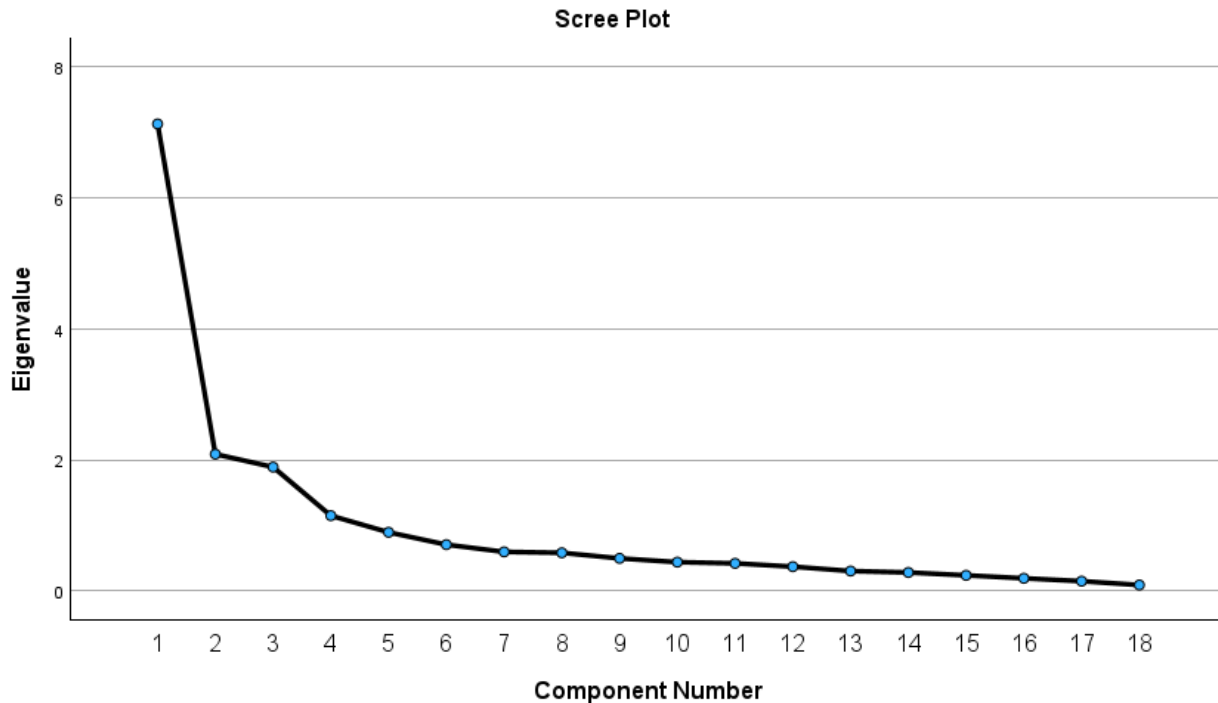
Chart 1: Scree Plot

Scree Plot

Chart 1 is a Scree plot used to determine the optimal number of factors to be retained in Factor analysis or principal component analysis. It plots the eigenvalues of each component. The number of components which fall on the steep slope are extracted because the eigenvalues of those components are greater than 1. Here, 4 components lie at the steeper side of the curve and all others lie on the flat portion of the curve. Therefore, the Scree Plot suggests four optimal components that impact the success of the SBM in Surat city.

Table 3: Component Matrix

Component Matrixª				
	Component			
	1	2	3	4
The government has offered sufficient support to local communities for waste management, including financial aid, technical guidance, and capacity building.	.794			
The implementation of waste management in Swachh Bharat Mission was effective in my area, with visible infrastructure improvements and community engagement.	.784			
The government effectively addressed challenges in the waste management of Swachh Bharat Mission by improving regulations, infrastructure, and fostering public-private partnerships.	.773			
My community is now more aware of the importance of cleanliness, with a stronger understanding of the impacts of littering and open defecation.	.751			
There were sufficient resources allocated in my area for waste segregation	.750			
The segregation of waste in Swachh Bharat Mission has created a lasting positive change in my community's cleanliness and sanitation practices.	.744			
Government policies related to waste segregation in Swachh Bharat Mission provided a clear framework and ensured accountability for its implementation.	.711			
Sustainable waste management practices, such as composting, recycling, and reducing plastic use, have been successfully promoted in my community through the Swachh Bharat Mission.	.700			
The wet and dry waste segregation of Swachh Bharat Mission has made a noticeable impact on improving cleanliness and sanitation in my community.	.697			
I have a clear understanding of the Swachh Bharat Mission's objectives (achieving open defecation-free status, waste management, and promoting a cleaner India)	.674			-.511
I have personally adopted more hygienic practices, such as segregating waste, and handwashing with soap, due to the Swachh Bharat Mission.	.653			
Within the Swachh Bharat Mission, the waste management was promoted effectively in my area through various media channels like television, radio, and social media.	.568			
I am confident that the Swachh Bharat Mission will leave a lasting legacy of cleanliness and hygiene in India.	.512	.748		
The Swachh Bharat Mission has contributed to a better quality of life in my community.	.563	.736		

Overall, I believe the Swachh Bharat Mission has been successful in improving sanitation and cleanliness in India.	.503	.730		
The Swachh Bharat Mission encountered issues with improper waste management, including littering, unauthorized dumping, and insufficient waste segregation.			.841	
Inadequate infrastructure, such as lack of proper waste collection presented a significant challenge to the Swachh Bharat Mission in densely populated areas			.755	
The Swachh Bharat Mission faced challenges in my area due to limited public participation, especially in rural regions.			.658	
Extraction Method: Principal Component Analysis.				
a. 4 components extracted.				

Table 3 shows the four components that are extracted. This is the unrotated component matrix which displays the correlation between variables and the extracted components. These correlations are known as factor loadings. Apparently, the first factor has more correlation with the variables than the second factor, the second factor has more correlation than the third factor and the third factor has more correlation than the fourth factor.

Table 4: Communalities

Communalities		
	Initial	Extraction
Within the Swachh Bharat Mission, the waste management was promoted effectively in my area through various media channels like television, radio, and social media.	1.000	.545
I have a clear understanding of the Swachh Bharat Mission's objectives (achieving open defecation-free status, waste management, and promoting a cleaner India)	1.000	.739
The wet and dry waste segregation of Swachh Bharat Mission has made a noticeable impact on improving cleanliness and sanitation in my community.	1.000	.686
The implementation of waste management in Swachh Bharat Mission was effective in my area, with visible infrastructure improvements and community engagement.	1.000	.627
There were sufficient resources allocated in my area for waste segregation	1.000	.599
The Swachh Bharat Mission faced challenges in my area due to limited public participation, especially in rural regions.	1.000	.585
Inadequate infrastructure, such as lack of proper waste collection presented a significant challenge to the Swachh Bharat Mission in densely populated areas	1.000	.675
The Swachh Bharat Mission encountered issues with improper waste management, including littering, unauthorized dumping, and insufficient waste segregation.	1.000	.733
I have personally adopted more hygienic practices, such as segregating waste, and handwashing with soap, due to the Swachh Bharat Mission.	1.000	.560
My community is now more aware of the importance of cleanliness, with a stronger understanding of the impacts of littering and open defecation.	1.000	.649
The segregation of waste in Swachh Bharat Mission has created a lasting positive change in my community's cleanliness and sanitation practices.	1.000	.605
Sustainable waste management practices, such as composting, recycling, and reducing plastic use, have been successfully promoted in my community through the Swachh Bharat Mission.	1.000	.607
Government policies related to waste segregation in Swachh Bharat Mission provided a clear framework and ensured accountability for its implementation.	1.000	.626
The government has offered sufficient support to local communities for waste management, including financial aid, technical guidance, and capacity building.	1.000	.712

The government effectively addressed challenges in the waste management of Swachh Bharat Mission by improving regulations, infrastructure, and fostering public-private partnerships.	1.000	.694
Overall, I believe the Swachh Bharat Mission has been successful in improving sanitation and cleanliness in India.	1.000	.853
The Swachh Bharat Mission has contributed to a better quality of life in my community.	1.000	.905
I am confident that the Swachh Bharat Mission will leave a lasting legacy of cleanliness and hygiene in India.	1.000	.853
Extraction Method: Principal Component Analysis.		

Table 4 represents Communalities. The communalities are used to estimate the variance that is unique to each variable. This variance which is unique to each variable is calculated by total variance explained by that variable minus the communality of that variable.

Table 5: Total Variance Explained

	Total Variance Explained								
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.129	39.607	39.607	7.129	39.607	39.607	5.117	28.430	28.430
2	2.087	11.596	51.203	2.087	11.596	51.203	2.694	14.965	43.395
3	1.890	10.499	61.702	1.890	10.499	61.702	2.552	14.177	57.572
4	1.148	6.377	68.079	1.148	6.377	68.079	1.891	10.507	68.079
5	.894	4.966	73.046						
6	.705	3.919	76.965						
7	.595	3.306	80.271						
8	.581	3.226	83.497						
9	.496	2.754	86.250						
10	.438	2.435	88.686						
11	.420	2.332	91.018						
12	.369	2.052	93.069						
13	.302	1.679	94.748						
14	.280	1.558	96.306						
15	.237	1.316	97.622						
16	.191	1.063	98.685						
17	.148	.820	99.505						
18	.089	.495	100.000						
Extraction Method: Principal Component Analysis.									

Table 5 represents the total variance, percentage variance and cumulative percentage variance for both- unrotated and rotated components. The first half of the table shows details of unrotated components, and the second half shows details of the rotated components. The cumulative variance for both rotated and unrotated components is 68.079 per cent. However, for unrotated components, the first component explains the maximum variance, followed by the declining variance of the other components, whereas in rotated components, the variance is more uniformly distributed. Component 1 accounts for 28.430 per cent of total variance, component 2 accounts for 14.954 per cent, component 3 accounts for 14.177 per cent and component 4 accounts for 10.507 per cent variance. The cumulative percentage of variance of rotated and unrotated components is always the same which in this study is 68.079 percent.

Table 6: Rotated Component Matrix

Rotated Component Matrix[a]	
	Component

	1	2	3	4
The government effectively addressed challenges in the waste management of Swachh Bharat Mission by improving regulations, infrastructure, and fostering public-private partnerships.	.802			
The government has offered sufficient support to local communities for waste management, including financial aid, technical guidance, and capacity building.	.802			
Government policies related to waste segregation in Swachh Bharat Mission provided a clear framework and ensured accountability for its implementation.	.768			
Sustainable waste management practices, such as composting, recycling, and reducing plastic use, have been successfully promoted in my community through the Swachh Bharat Mission.	.757			
My community is now more aware of the importance of cleanliness, with a stronger understanding of the impacts of littering and open defecation.	.752			
There were sufficient resources allocated in my area for waste segregation	.713			
The segregation of waste in Swachh Bharat Mission has created a lasting positive change in my community's cleanliness and sanitation practices.	.702			
The implementation of waste management in Swachh Bharat Mission was effective in my area, with visible infrastructure improvements and community engagement.	.686			
The Swachh Bharat Mission has contributed to a better quality of life in my community.		.912		
Overall, I believe the Swachh Bharat Mission has been successful in improving sanitation and cleanliness in India.		.898		
I am confident that the Swachh Bharat Mission will leave a lasting legacy of cleanliness and hygiene in India.		.894		
I have a clear understanding of the Swachh Bharat Mission's objectives (achieving open defecation-free status, waste management, and promoting a cleaner India)			.787	
The wet and dry waste segregation of Swachh Bharat Mission has made a noticeable impact on improving cleanliness and sanitation in my community.			.718	
Within the Swachh Bharat Mission, the waste management was promoted effectively in my area through various media channels like television, radio, and social media.			.676	
I have personally adopted more hygienic practices, such as segregating waste, and handwashing with soap, due to the Swachh Bharat Mission.			.619	
The Swachh Bharat Mission encountered issues with improper waste management, including littering, unauthorized dumping, and insufficient waste segregation.				.828
Inadequate infrastructure, such as lack of proper waste collection presented a significant challenge to the Swachh Bharat Mission in densely populated areas				.785
The Swachh Bharat Mission faced challenges in my area due to limited public participation, especially in rural regions.				.723
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 5 iterations.				

In table 6, each number represents the partial correlation coefficient between the variable and the rotated component. These coefficients help in identifying the components. All the variables that have large factor loadings for a given component define the component.

1. **Government and Community factors**

2.   **Hygiene factors and quality of life**
3.   **Awareness and Adoption**
4.   **Infrastructure**

Here, the variables constituting **component 1 – Government and Community factors** are:

1.   The government effectively addressed challenges in the waste management of Swachh Bharat Mission by improving regulations, infrastructure, and fostering public-private partnerships.

2.   The government has offered sufficient support to local communities for waste management, including financial aid, technical guidance, and capacity building.

3.   Government policies related to waste segregation in Swachh Bharat Mission provided a clear framework and ensured accountability for its implementation.

4.   Sustainable waste management practices, such as composting, recycling, and reducing plastic use, have been successfully promoted in my community through the Swachh Bharat Mission.

5.   My community is now more aware of the importance of cleanliness, with a stronger understanding of the impacts of littering and open defecation.

6.   There were sufficient resources allocated in my area for waste segregation

7.   The segregation of waste in Swachh Bharat Mission has created a lasting positive change in my community's cleanliness and sanitation practices.

8.   The implementation of waste management in Swachh Bharat Mission was effective in my area, with visible infrastructure improvements and community engagement.

The variables constituting **component 2 - Hygiene factors and quality of life** are:

1.   The Swachh Bharat Mission has contributed to a better quality of life in my community.

2.   Overall, I believe the Swachh Bharat Mission has been successful in improving sanitation and cleanliness in India.

3.   I am confident that the Swachh Bharat Mission will leave a lasting legacy of cleanliness and hygiene in India.

The variables constituting **component 3 – Awareness and Adoption** are:

1.   I have a clear understanding of the Swachh Bharat Mission's objectives (achieving open defecation-free status, waste management, and promoting a cleaner India)

2.   The wet and dry waste segregation of Swachh Bharat Mission has made a noticeable impact on improving cleanliness and sanitation in my community.

3.   Within the Swachh Bharat Mission, the waste management was promoted effectively in my area through various media channels like television, radio, and social media.

4.   I have personally adopted more hygienic practices, such as segregating waste, and handwashing with soap, due to the Swachh Bharat Mission.

The variables constituting **component 4 – Infrastructure** are:

1.   The Swachh Bharat Mission encountered issues with improper waste management, including littering, unauthorized dumping, and insufficient waste segregation.

2.   Inadequate infrastructure, such as lack of proper waste collection presented a significant challenge to the Swachh Bharat Mission in densely populated areas

3.   The Swachh Bharat Mission faced challenges in my area due to limited public participation, especially in rural regions.

Table 7: Component Transformation Matrix

Component Transformation Matrix				
Component	1	2	3	4
1	.797	.358	.482	.075
2	-.425	.891	.016	.161
3	-.084	-.216	.149	.961
4	.422	.178	-.863	.211
Extraction Method: Principal Component Analysis.				
Rotation Method: Varimax with Kaiser Normalization.				

Table 7 displays the specific rotation applied to the components. Rotated factor loadings are obtained by multiplying the unrotated factor loadings matrix with components transformation matrix.

Findings:
The results of Principal Component Analysis reveal that the success of the Swachch Bharat mission is fuelled by the following factors in descending order of importance:
1. **Government and Community factors**
2. **Hygiene factors and quality of life**
3. **Awareness and Adoption**
4. **Infrastructure**

Thus, local government bodies such as the Municipal corporations should focus on the above mentioned four factors to enhance the effectiveness of the Swachch Bharat Mission.

Discussion and conclusion:
The Swachh Bharat Mission (SBM) in Surat has made significant progress in waste segregation practices, aligning with several Sustainable Development Goals (SDGs), particularly SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), and SDG 12 (Responsible Consumption and Production). The mission's focus on improving sanitation, promoting waste management, and enhancing urban cleanliness directly contributes to these global objectives.

However, the challenges identified in this study highlight the need for continued efforts to fully achieve these SDGs. The inconsistent public awareness and behavioral changes, despite extensive campaigns, underscore the importance of SDG 4 (Quality Education) in promoting sustainable practices. The infrastructural challenges, particularly in densely populated and semi-urban areas, emphasize the need for inclusive development as outlined in SDG 10 (Reduced Inequalities).
To further align with the SDGs, future improvements in SBM should consider:
1. Integrating sustainable waste management technologies to address SDG 9 (Industry, Innovation, and Infrastructure).
2. Promoting circular economy principles in waste management to support SDG 12.
3. Enhancing partnerships between government, private sector, and communities to achieve SDG 17 (Partnerships for the Goals).
By addressing these aspects, SBM can not only improve waste management in Surat but also contribute more comprehensively to India's commitment to the global sustainable development agenda.

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