



Evaluating the Quality of Waste Collection Services in Santa Elena A Citizen-Centered Descriptive Study

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ABSTRACT

This study assesses public perceptions of municipal solid waste collection services in the canton of Santa Elena, Ecuador, using a descriptive approach grounded in survey responses from local residents. The analysis focuses on key service dimensions including reliability, responsiveness, and citizen communication. Findings reveal widespread dissatisfaction, citing inconsistent adherence to collection schedules, limited responsiveness to complaints, and insufficient coverage in select urban zones. Additionally, a lack of clear and timely communication regarding routes and collection times contributes to citizen uncertainty. The research identifies the need to strengthen the relationship between service providers and residents by implementing participatory oversight strategies and enhancing communication mechanisms. Recommended improvements include integrating digital tools for real-time service updates and adopting more efficient, transparent management models. Overall, the study concludes that participatory governance and community engagement are essential to improving waste service delivery and building citizen trust in public infrastructure.

Keywords

- Solid waste management
- Citizen engagement
- Service quality assessment
- Public utilities
- Participatory governance

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1. Introduction

Solid waste management is a fundamental urban administration component, as it influences the population's life quality and environmental sustainability. In several Latin American cities, waste collection remains a challenge due to the lack of adequate infrastructure and limited citizen participation in recycling and waste sorting processes. The lack of adequate waste management strategies has negatively impacted public health and citizen perceptions of government efficiency.

Governance plays a fundamental role by providing a framework for participatory decision-making, empowering the community, and promoting shared responsibility in the process of continuous service improvement. This is expected to contribute to a cleaner and healthier environment by strengthening the relationship between the institution and citizens, improving quality, and laying the foundations for sustainable urban development.

Among the leading countries in solid waste management are Germany, Japan, South Korea, and Taiwan. Through political, social, and environmental management processes, they have declared their concern and strengthened their planet responsibility, generating Ibero-American and Asian-European Summits where priority needs are discussed to ensure the humanity's sustainability.

The Pan American Health Organization recognizes that, of total solid waste collected, only a small, significant portion can be classified as recyclable material; this activity is also carried out by informal sector in low-income areas. A waste collection implementation and separation system

are in its initial stages; some countries, such as Chile, have achieved majority coverage in their urban areas by approving the solid waste collection provision and management services to duly regulated private companies.

However, despite of some countries' involvement in implementing a regulated waste separation system, there is no adequate implementation worth highlighting, given that most implementation fails due to a lack of environmental awareness and the lack of efficient policies and strategies on the part of those providing the service.

Latin America maintains a waste management system inherited from previous centuries based on landfills. These consist of landfills opening in areas far from the urban population for the garbage disposal without any separation type or sorting. In addition, garbage incineration is common in some countries. However, there are times when a lack of compliance is evident in urban areas, and waste is indiscriminately deposited in any sector the population deems appropriate.

In Ecuador, the public service line has a context similar to the process presented internationally, where the model attributes to the government-subsidized creation companies that specifically serve drinking water, sanitation, and solid waste management services, among others. Its capital, Quito, has a solid waste management model led primarily by the Empresa Pública Metropolitana de Gestión Integral de Residuos Sólidos (EMGIRS-EP), responsible for integrated solid waste management. This model is supported by various national and local environmental



regulations and policies. This model offers high collection coverage in rural areas, and citizens share an intrinsic commitment to recycling and the hazardous materials management. The city has transfer and recycling stations where materials such as paper, cardboard, plastics, glass, etc. are sorted. After sorting, non-recyclable materials are transferred to the Quito's Metropolitan District sanitary landfill, which aims to minimize the risks, social impacts, and environmental impact caused by urban solid waste.

Guayaquil, the country's largest city, has a waste management and collection system managed by the Empresa Pública Urvaseo. It offers extensive solid waste collection coverage. However, significant problems remain related to its disposal or final disposal. The most significant issue is the landfills' saturation and the lack of adequate facilities for recycling and managing discarded organic and inorganic matter.

In the Santa Elena canton, the Empresa Municipal de Aseo de Santa Elena (EMASA E.P.) is responsible for solid waste collection. Despite institutional efforts, citizen's quality service perceptions have generated concern among local authorities and the community. Factors such as inconsistent waste collection, insufficient dissemination of collection schedules and routes, and a lack of feedback mechanisms have contributed to a negative service perception. This study aims to assess citizen's service perceptions efficiency and identify areas for improvement to ensure more effective and sustainable management. Furthermore, the study analyzes the relationship between company performance and citizen trust in the public services management, also addressing the environmental impact of an inefficient collection system.

Public services research provided by EMASA E.P., in Santa Elena's city urban area is necessary since it goes beyond a simple quality investigation or efficiency, that is why, the research's purpose work is based on knowing how citizens perceive this service provided by said institution especially with regard to the solid waste collection, drains cleaning, community efforts cleaning, weed removal and public areas cleaning, remembering that these are the main services offered by the company, therefore, the level of user satisfaction with respect to the services is necessary to identify, correct deficiencies, optimize collection processes and improve other aspects that influence the waste management effectiveness and urban cleaning in general.

The study allows us to examine the public quality services and analyze the best tools for building a sustainable, fair, and democratic society, where citizens demand a more integrated approach to providing efficient, effective services that facilitate waste management. Current challenges and strategies related to the continuous public quality management improvement focus not only on internal processes but also on improving quality at the citizens' discretion.

2. Literature review

Hu et al. [1] mention that solid waste management is a companies' responsible commitment for city cleanliness. By implementing effective strategies for collection, sorting, and recycling, they not only reduce the garbage amount in landfills but also contribute to a more sustainable resources' cycle, from organic waste to the recyclable products choice, an aspect that benefits an entire city, the environment in general, and, above all, fosters healthy communities.

Zhang et al. [2], in response to the rapid waste's growth generation in China, has conducted several studies on waste sorting and management practices in urban and rural areas, a very important issue for the country. Thus, service quality became a differentiating element that not only helped retain users but also earned a positive reputation, responding quickly and efficiently for citizens' benefit. Likewise, the research "Solid Waste Management in Brazil" mentions that solid waste produced in the country's urban areas is Brazilian's municipalities responsibility, which are responsible for managing a large this waste type volume [3].

At La Salle University in Brazil, a study was conducted on "The so-called National Solid Waste Policy was instituted in Brazil in 2010, establishing responsibility for solid waste management among the various government bodies, primarily at the local municipal level" [4]. In Brazil, local entities are responsible for providing this service to improve their cities, with reference to community well-being.

According to [5], the research carried out in Barcelona city explored the quality of waste collection from the perspective of each citizen. This study evaluated the proximity effect between competitors on the service quality provision, thus highlighting public goods and their practical application. A special focus on these services is on the government concern to improve the services provided by different public entities, and a new perspective that explains some government officials purpose to create community satisfaction.

Likewise, according to a study conducted on the services quality provided by public and private companies in Peru, it is stated that "the world has changed, leading to new needs public services users. From an administrative perspective, these services are considered fundamental assets for society" [6].

In the study proposed by Jerez Peñafiel et al. [7], the objective was to evaluate the solid quality waste collection service in (Gobierno Autónomo Descentralizado de Milagro [Milagro's Decentralized Autonomous Government]).

The service sector is increasingly important in many countries' economies, which has led governments to focus on service quality and public satisfaction. In particular, residential public services, such as solid waste collection, are

crucial to meeting the collective citizens' needs on a continuous basis and under the State supervision.

According to Peñafiel-Álvarez & Bermeo-Pazmiño [8], user evaluation is based on various models that consider a citizen's experiences variety. Therefore, using an adaptable evaluation tool not only analyzes the standards and processes established by the institution, but also the customer's perceptions and expectations regarding the service received, as well as the specific characteristics and each organization needs. This ensures a more accurate measurement, thereby obtaining the necessary feedback to improve the service.

3. Methodology

For the development of this study, a descriptive research project was implemented. The purpose of this research was to establish user satisfaction by studying the quality of public services, analyzing the following dimensions: tangible elements, reliability, empathy, responsiveness, and security. It is important to note that the descriptive research focused on characterizing the perceptions of citizens in the urban area of the Santa Elena canton regarding the provision of public services provided by EMASA E.P., determining their quality through a study of user satisfaction.

It is also worth mentioning that the positivist paradigm provides a solid framework for this research process, as it seeks to understand social phenomena through quantitative methods. It is also based on objective reality premise, which can be understood through scientific methods. This provides empirical verification and guarantees the existence of reliable and applicable results within a practical context, as in the case of this study on the quality of public services provided by EMASA E.P.

This research used a survey as a tool, administered through Google Forms. The survey displayed 19 items adapted to service to be evaluated, presented using a Likert scale. These items allowed for the services quality measurement offered by EMASA E.P. The survey is structured around five key dimensions: tangibility, reliability, responsiveness, security, empathy, and responsiveness, with the obtaining goal accurate information from all users about the public services provided by company.

This study adopts a descriptive approach with a quantitative and cross-sectional design. A structured survey was administered to 382 residents of the urban area of the Santa Elena canton. The sampling was simple random probability, considering citizens between 20 and 65 years of age. The survey included questions about service efficiency, adherence to schedules, quality of customer service, and overall satisfaction with the EMASA E.P. performance.

The data were processed using SPSS statistical software, allowing for a detailed analysis of citizen perceptions and the identification of trends in service delivery. Frequency and correlation analyses were performed to evaluate the

relationship between customer satisfaction and variables such as service punctuality, quality of service, and communication with the community. In addition, a reliability analysis using Cronbach's alpha coefficient was applied to ensure internal consistency of the data obtained. The correlation between customer satisfaction and service reliability was also analyzed, taking into account factors such as collection frequency and the company's response to reported problems. In addition, the citizen perception impact on the community's willingness to collaborate with the company in improving service was evaluated.

Table 1 shows that Cronbach's alpha was .808. This translates to an instrument considered valid and reliable with respect to the questions reliability. Therefore, its application was consistent for the study, providing reliable information by dividing the research variable dimensions.

Table 1: Reliability statistics.

| | |
|------------------|------|
| Alfa de Cronbach | .808 |
|------------------|------|

Note: Data processed using SPSS software based on data obtained from the pilot test.

4. Result

According to Table 2, total significant percentage responses agree that EMASA E.P. occasionally delivers the promised service within the stipulated timeframe. However, 31.4% of the population states that the company rarely fulfills its promises within a specific timeframe. This indicates a need to improve the company's commitment.

Table 2: When EMASA E.P. promises to do something in a certain time, does it actually do so.

| Category | Frequency | Valid percentage |
|--------------|-----------|------------------|
| Never | 46 | 12.0 % |
| Rarely | 120 | 31.4% |
| Occasionally | 136 | 35.6 % |
| Most of time | 53 | 13.9 % |
| Always | 27 | 7.1 % |
| Total | 382 | 100.0 |

According to Table 3, 38.7% of the total surveyed population responded in the "occasional" category, followed by "rarely" (infrequently) at 26.4%. This demonstrates a fairly high percentage indicating that EMASA E.P. shows no interest in solving any problems users may have. This leads to an increased citizen dissatisfaction level due to the failure to meet expectations and a lack of effective communication, which can lead to conflicts and misunderstandings.

Table 3: When you have a problem, does EMASA EP show a sincere interest in solving it.

| Category | Frequency | Valid percentage |
|--------------|-----------|------------------|
| Never | 48 | 12.6 |
| Rarely | 101 | 26.4 |
| Occasionally | 148 | 38.7 |

| | | |
|---------------|-----|-------|
| Most of times | 54 | 14.1 |
| Always | 31 | 8.1 |
| Total | 382 | 100.0 |

According to Table 4, it can be mentioned that a significant percentage of respondents agree that occasionally and rarely EMASA E.P., does its job well the first time, whether it is waste collection, cleaning of public areas, or drains, several users experience low overall satisfaction with the service and correct operation, thus, it can be noted that actions are needed to improve the efficiency and quality of the service to raise user satisfaction levels, since due to the results obtained there is a deficiency on the part of the company when performing its services.

Table 4: Does EMASA E.P. perform its service well the first time.

| Category | Frequency | Valid percentage |
|--------------|-----------|------------------|
| Never | 39 | 10.2 |
| Rarely | 103 | 27.0 |
| Occasionally | 128 | 33.5 |
| Most of time | 81 | 21.2 |
| Always | 31 | 8.1 |
| Total | 382 | 100.0 |

According to Table 5, the majority of respondents perceive that the service provided is "occasional" (31.4%) or "rarely" (26.2%), indicating a worrying inconsistency in punctuality. Only 18.6% state that the service is provided "most of the time," and 14.7% maintain that it is provided "always." 9.2% report that EMASA EP. never meets its schedule, which represents a significant problem.

Table 5: Does EMASA E.P. provide its service on time.

| | | |
|---------------|-----|-------|
| Never | 35 | 9.2 |
| Rarely | 100 | 26.2 |
| Occasionally | 120 | 31.4 |
| Most of times | 71 | 18.6 |
| Always | 56 | 14.7 |
| Total | 382 | 100.0 |
| Never | 35 | 9.2 |

According to Table 6, it can be understood that the majority of users who completed the survey responded, with 34% in the occasional category. Among those who rarely respond, the percentage is also considered high. This suggests that the company does not pay adequate attention to errors that arise during the execution of the service, causing a critical deficiency in the management of user services. Furthermore, the fact that only 23% of those between "most of the time" and "always" mentioned that they pay attention is not a significant percentage to avoid the widespread negative perception caused by the company's lack of attention.

Table 6: Does EMASA E.P. pay attention to error logs arising from the provision of its service.

| Category | Frequency | Valid percentage |
|--------------|-----------|------------------|
| Never | 46 | 12.0 |
| Rarely | 116 | 30.4 |
| Occasionally | 130 | 34.0 |
| Most of time | 64 | 16.8 |
| Always | 26 | 6.8 |
| Total | 382 | 100.0 |

According to the data in Table 7, it was found that the majority of users who responded to the survey strongly agree that users should be kept informed about when the company will perform services, while a low percentage remain neutral or disagree. Consequently, it is clear that the majority of users support the idea that communication should be provided when services will be provided, implying that the company does not maintain effective communication with users, generating dissatisfaction at the time of receiving the service.

Table 7: Do you think EMASA E.P. staff should keep users informed about when services will be performed.

| Category | Frequency | Valid percentage |
|------------------|-----------|------------------|
| Totally disagree | 3 | 0.8 |
| Disagree | 19 | 5.0 |
| Neutral | 62 | 16.2 |
| Agree | 104 | 27.2 |
| Totally agree | 194 | 50.8 |
| Total | 382 | 100.0 |

As Table 8 shows, a fairly high percentage of users (72.3%) responded that EMASA E.P. offers prompt service "occasionally," "rarely," and "never." While a low percentage of users (27.7%) responded that it does provide prompt service "most of the time" and "always." However, the perception of the company's staff's service is concerning, as it indicates that a considerable portion of users feel that the response time does not meet their expectations.

Table 8: Does EMASA E.P. staff offer prompt service.

| Category | Frequency | Valid percentage |
|--------------|-----------|------------------|
| Never | 42 | 11.0 |
| Rarely | 98 | 25.7 |
| Occasionally | 136 | 35.6 |
| Most of time | 78 | 20.4 |
| Always | 28 | 7.3 |
| Total | 382 | 100.0 |

According to Table 9, it can be seen that users who responded to the survey indicated that "occasionally," "rarely," and "never," with a considerably high percentage, EMASA E.P. staff are not always willing to help, while "most of the time" and "always" they do perceive a willingness to help users. This implies that attention should be

paid to the service provided by the staff, as it is not favorable to the company.

Table 9: Is the EMASA E.P. staff always willing to help you.

| Category | Frequency | Valid percentage |
|--------------|-----------|------------------|
| Never | 42 | 11.0 |
| Rarely | 111 | 29.1 |
| Occasionally | 119 | 31.2 |
| Most of time | 78 | 20.4 |
| Always | 32 | 8.4 |
| Total | 382 | 100.0 |

Table 10 shows that EMASA E.P. staff correctly answer the questions posed. Users mentioned that "occasionally," "rarely," and "never." A high percentage of users reported inconsistent responses to questions. While a portion of the population agreed that "most of the time" and "always" staff do indeed answer the questions posed, emphasizing the need to improve customer service.

Table 10: Do EMASA E.P. staff respond correctly to the questions asked.

| Category | Frequency | Valid percentage |
|--------------|-----------|------------------|
| Never | 44 | 11.5 |
| Rarely | 108 | 28.3 |
| Occasionally | 122 | 31.9 |
| Most of time | 78 | 20.4 |
| Always | 30 | 7.9 |
| Total | 382 | 100.0 |

5. Discussion

This study findings are consistent with previous research in Latin America, where the waste quality collection services are often affected by operational deficiencies and a lack of communication with citizens. Lack of information about collection schedules and inconsistent response to citizen requests affect service perceptions.

In other international contexts, improvement strategies have included mobile implementation applications to report incidents and receive real-time updates, as well as the collection automation processes through the sensors use and tracking technology. Adapting these strategies to Santa Elena's city reality could contribute to optimizing the service and strengthening the relationship between the company and the community. Some viable strategies include implementing educational campaigns on proper waste disposal, using mobile apps to provide information on collection schedules and routes, and creating incentive programs to encourage recycling. Likewise, establishing dialogue tables between citizens and the company would allow for collecting suggestions and improving service quality, promoting more efficient and participatory management.

Furthermore, the lack of information and effective communication from EMASA E.P. also contributes to the negative perception. Most users expressed their annoyance

that the company does not keep citizens informed about when services will be performed, although they believe the company should be keeping them informed.

6. Conclusion

The study confirms that there are deficiencies in the waste quality collection service in the Santa Elena's city, particularly in compliance with schedules and customer service. It is recommended that more effective communication strategies be implemented and operational processes optimized to improve citizen satisfaction and service efficiency.

Furthermore, strengthening governance through the approach development guided by participatory social management will not only improve the quality services but also contribute to building a cleaner and healthier environment Santa Elena's city in the urban area. It is important to strengthen trust in the interaction between citizens and the public entity, which in turn can positively and effectively influence the perception of the service, as well as result in sustainable urban development and greater user satisfaction.

Consequently, not only does it contribute to improving the public service quality, but it also facilitates greater citizen participation in the process related to solid waste management and the public areas cleaning, thus promoting a stronger environmental culture. However, it is important to emphasize that, from an institutional perspective, priority should be given to the quality control implementation system optimized through the technological resources use, without neglecting human resources and the effective mechanisms design that facilitate service feedback.

It is important to mention that achieving an optimal public service provision level provided by EMASA E.P. through mechanisms based on the interaction between the company and its users will allow for a participatory approach where governance can be the key element for developing an ongoing dialogue between both parties, allowing for the direct area's identification for improvement and, through this, the development of strategies that respond to community expectations.

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