



SERVICES OF THE SURABAYA CITY ENVIRONMENTAL SERVICE IN SUPPORTING SUSTAINABLE DEVELOPMENT THROUGH CONTROLLING WASTE INTO THE SEA

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Abstract :

This study aims to analyze the services of the Surabaya City Environmental Agency (DLH) in supporting sustainable development through controlling waste into the sea based on the principles of good governance. The background of this study is based on the urgency of the problem of coastal water pollution in Surabaya City due to the discharge of domestic and industrial waste that has not been fully controlled, resulting in a decline in the quality of the marine ecosystem and the welfare of coastal communities. This condition demands an in-depth evaluation of the quality of local government services in managing waste based on the principles of good governance. The study used a qualitative descriptive method with a case study approach. Data were obtained through in-depth interviews, field observations, and documentation, then analyzed using the interactive model of Miles, Huberman, and Saldaña. The results show that the transparency of the Surabaya City DLH services has been running quite well through the provision of information on digital media and socialization activities, although access to real-time environmental data is still limited. Service responsiveness is quite good with the availability of various public complaint channels, but is still hampered by limited personnel and monitoring technology. The effectiveness and efficiency of services are demonstrated by an increase in the Water Quality Index (IKA) from 52 in 2022 to 61 in 2025, as well as an increase in the number of communal wastewater treatment plants (WWTPs) from 48 to 79. The novelty of this research lies in the integrated analysis of three dimensions of good governance in the context of urban coastal waste management services in Surabaya, a context that has not been widely studied specifically in Indonesia.

Keywords : Effectiveness; good governance; sustainable development; public service; transparency.

INTRODUCTION

Bureaucratic reform in Indonesia has driven a paradigm shift in government administration toward a more democratic, effective, transparent, and service-oriented approach. This shift aligns with the concept of good governance, which positions the government as a service provider responsible for meeting public needs and sustainably managing public resources. In the context of regional government, the implementation of good governance is a crucial instrument for improving the quality of public services while strengthening public trust in bureaucratic performance.

Surabaya is one of the largest metropolitan areas in Indonesia, characterized by its industrial, commercial, service, and coastal character. This geographical location makes Surabaya a center of economic growth, generating



large-scale industrial and domestic activity. However, this high level of economic activity has the potential to put serious pressure on environmental quality, particularly water pollution from domestic and industrial waste. Data from the Ministry of Environment and Forestry (KLHK) in 2022 indicates that approximately 70–80 percent of marine pollution originates from land-based activities, including the discharge of untreated liquid waste. Most of the waste generated from residential and industrial areas in Surabaya flows through the Kalimas River, the Jagir River, and several other tributaries before flowing into the Madura Strait, potentially causing degradation of the coastal waters.

The problems faced are quite complex. Based on data from the Surabaya City Environmental Agency (2022), the city's river water quality index remains in the moderate category, with an IKA score of 52 on a scale of 100. The main sources of pollution are domestic waste from densely populated residential areas (contributing approximately 60 percent of the pollutant load), followed by industrial waste and small and medium-scale businesses (approximately 30 percent), and agricultural runoff and urban drainage (approximately 10 percent). Of the 1,200 industries operating in Surabaya, only approximately 65 percent have functioning Wastewater Treatment Plants (WWTPs). This situation indicates a persistent gap between applicable regulations and implementation in the field. Furthermore, in terms of public services, the Surabaya City Environmental Agency's environmental supervisory capacity is only approximately 47 personnel to oversee thousands of monitoring points and pollution sources throughout the city.

Coastal water pollution is a strategic issue that not only damages marine ecosystems but also impacts the socio-economic conditions of coastal communities that depend on aquatic resources for their livelihoods. Deteriorating seawater quality can disrupt fisheries productivity, reduce the quality of marine biota habitats, and increase public health risks. Therefore, the active role of local governments is needed through the Environmental Agency (DLH), the institution authorized to supervise and control pollution, provide guidance to business actors, and provide public services in the environmental sector.

The urgency of this research is further strengthened by the fact that the implementation of waste control policies still faces various serious challenges. From a *das sollen* perspective, Law Number 32 of 2009 mandates that all business activities must manage waste in accordance with environmental quality standards. However, from a *das sein* perspective, various cases of river and coastal water pollution have been found, indicating that waste control implementation is not yet fully optimal. Limited monitoring resources, suboptimal utilization of environmental monitoring technology, and low levels of compliance among some business actors are factors that influence the effectiveness of this policy implementation.

Globally, coastal pollution control is a key component of the Sustainable Development Goals (SDGs), particularly Goal 6 on clean water and sanitation and Goal 14 on Life Below Water. The successful implementation of SDG 14 in

urban coastal areas is largely determined by the capacity of local governments to control land-based pollution sources.

Several previous studies relevant to this research need to be reviewed to map the position and contribution of the research conducted. First, Pratama & Nugroho examined inter-agency coordination in environmental pollution control in Indonesia. The study found that the effectiveness of pollution control is significantly influenced by the quality of cross-sectoral coordination between the government, business actors, and the community. The strength of Pratama & Nugroho's study lies in the depth of their institutional analysis, which maps the roles of each actor in the environmental governance network. However, the study did not specifically examine environmental agency services in coastal areas, did not discuss the dimensions of transparency and responsiveness of public services, and did not explicitly link the findings to a sustainable development framework.

Second, Rahmawati examined the contribution of environmental information transparency to increasing public trust in local governments. Her research findings indicate a significant positive correlation between environmental data transparency and public trust in government performance. The strengths of this study are its clear focus on a single dimension of good governance (transparency) and the use of standardized measurement instruments. However, Rahmawati's research does not integrate transparency analysis with the dimensions of responsiveness and service effectiveness, nor does it specifically address the coastal and marine waste management sector.

Third, Chen & Zhang highlight the importance of utilizing digital technology in improving the effectiveness of environmental monitoring and the capacity of local governments in pollution control. The strength of this research lies in its innovative perspective in integrating digital environmental governance with local government capacity. However, Chen & Zhang's research was conducted in the context of an East Asian country with significantly different technological and institutional capacities than Indonesia. The study also does not address the social dimensions of public services, such as responsiveness and public satisfaction as service users.

Based on the results of previous research, a research gap remains in the study of environmental public services. Most previous studies have focused on aspects of institutional coordination, environmental information transparency, or the use of technology in pollution monitoring separately. Research on public services in the waste management sector integrated with good governance principles, particularly in urban coastal areas, remains relatively limited. This is despite the fact that urban coastal areas are inherently more complex, facing the simultaneous pressures of industrial activity, population growth, and the demands of sustainable development.

This research offers novelty in two main aspects. First, the research integrates the dimensions of transparency, responsiveness, and service effectiveness and efficiency within a single good governance analytical framework applied to waste control services by local governments. Second, the

research is conducted in the context of waste control that flows into the coastal areas of Surabaya City, thus providing a new perspective on the relationship between the quality of environmental public services and efforts to achieve sustainable development, specifically Sustainable Development Goals (SDGs) number 6 (Clean Water and Sanitation) and number 14 (Life Below Water). Thus, this research is expected to enrich the public administration literature, especially in the field of environmental service governance in coastal urban areas.

RESEARCH METHOD

This research uses a descriptive qualitative approach with a case study method to gain a deep understanding of the implementation of good governance principles in the Surabaya City Environmental Agency (DLH) services related to waste control that has the potential to pollute marine waters. This approach was chosen because it is able to describe the phenomenon holistically based on the experiences and perspectives of the actors directly involved. The focus of the research is directed at analyzing the governance of public services in the Surabaya City DLH, including aspects of transparency, responsiveness, effectiveness and efficiency of services, as well as factors that support and hinder its implementation. The research was conducted at the Surabaya City DLH and several supporting locations, such as coastal areas, riverbanks, and communal wastewater treatment plants (IPAL) in May 2026.

Data collection was conducted through in-depth interviews, field observations, and documentation studies. Semi-structured interviews were conducted with informants consisting of officials and technical staff from the Surabaya City Environmental Agency (DLH), environmental supervisors, industry representatives, and affected communities. Observations were used to directly observe environmental conditions and the implementation of pollution control services, while documentation was conducted by reviewing various official documents, performance reports, regulations, and relevant environmental data. The combination of these three techniques was used to obtain comprehensive data and support the triangulation process.

Data analysis was conducted using the interactive analysis model of Miles, Huberman, and Saldaña, which includes data reduction, data presentation, and drawing and verifying conclusions. Data validity was maintained through source and technique triangulation by comparing interview results, observations, and documentation. Furthermore, member checking was conducted with key informants to ensure the researchers' interpretations matched the actual conditions, ensuring a high level of credibility.

RESULTS AND DISCUSSION

Transparency

Transparency is the primary principle of good governance, relating to the government's openness in providing information that is easily accessible and understandable to the public (UNDP, 1997). In the context of Surabaya City Environmental Agency (DLH) services, transparency includes disclosure of

information on waste management programs and policies, environmental quality monitoring results, and regulations governing business activities. The study found that transparency in Surabaya City Environmental Agency (DLH) services has been operating at a fairly good level, although several aspects still need improvement.

Based on the results of an interview with the Head of the Pollution Control Division of the Surabaya City Environmental Agency, it was discovered that information was conveyed to the public through various official communication channels:

"Transparency in the implementation of environmental monitoring duties and activities at the Surabaya City Environmental Agency (DLH) is open to residents and businesses, from the policy process, planning, implementation, to periodic monitoring. All environmental quality standards are also communicated openly and can be accessed through the city government's official website and the agency's social media channels so that all parties who need information can understand it clearly."

This statement demonstrates the Environmental Agency's commitment to transparency, both at the policy and implementation principles level. The use of various digital channels, such as the city government's official website, the agency's social media accounts, and its public information portal, demonstrates efforts to expand the reach of information to the public. This aligns with Rahmawati's (2022) findings, which state that the use of digital platforms significantly increases the accessibility of environmental information and public trust in local government.

However, when researchers delved deeper into the accessibility of environmental technical information, a more nuanced picture emerged. A DLH Technical Officer stated:

"Information transparency infrastructure is actually supported by official websites and social media. However, when it comes to real-time water quality data disclosure, the information system isn't yet fully available to the public instantly. Some more detailed technical information still requires written requests or special documents, so the public can't yet access it directly from home."

This statement reveals a gap between the transparency of general information and the transparency of real-time technical environmental data. This situation is important to note because direct access to water quality data is a public right guaranteed by Law Number 14 of 2008 concerning Public Information Disclosure. Chen & Zhang (2023) suggest that governments that fully adopt digital environmental governance can increase the effectiveness of environmental monitoring by up to 40 percent compared to conventional manual systems. The limitations of the real-time information system at the Surabaya City Environmental Agency (DLH) have the potential to reduce the ability of the public and independent researchers to conduct participatory monitoring of coastal environmental conditions.

From the perspective of interviewed industry representatives, it was found that environmental quality standard regulations are regularly disseminated through official forums involving business actors. Industries that

already have wastewater discharge permits have access to more comprehensive information regarding technical standards and monitoring procedures. However, small and medium-sized businesses that are not yet registered or have complete permits tend to have more limited access to information, which in turn contributes to low levels of environmental compliance in this business segment.

Interviewed coastal communities, particularly fishermen, stated that they obtain more information about marine environmental conditions through direct observation and community communication than through official Environmental Agency (DLH) information channels. This indicates that the DLH's outreach to vulnerable groups most impacted by marine pollution still needs to be significantly improved.

Overall, the transparency of Surabaya City Environmental Agency services is in the fairly good category, with strengths in the dissemination of policy and regulatory information through digital media, but still requires improvements in aspects of real-time accessibility of environmental technical data, integrated information systems, and outreach to coastal communities and small business actors.

Responsiveness

Responsiveness is the ability of a government organization to recognize and respond to community needs and aspirations quickly, accurately, and in accordance with actual conditions (UNDP, 1997). In the context of the Surabaya City Environmental Agency (DLH), responsiveness is measured by the agency's ability to respond to public reports and complaints regarding suspected environmental pollution, as well as the speed of follow-up on these reports. The results of the study indicate that the Surabaya City Environmental Agency (DLH) has developed a fairly comprehensive multi-channel complaint system, although its effectiveness still faces several obstacles.

First, an environmental complaint call center is available to receive public reports regarding pollution. Interviews with officers in the complaint handling department revealed that reports received through the call center are directly forwarded to the supervisory department for field verification. In 2024, 324 complaints were received through this channel, with an average response time of two working days for initial verification and five working days for field inspections. Sinambela (2022) stated that a good standard response time for environmental complaints should not exceed 24 hours for initial verification and three working days for field follow-up.

Second, the Surabaya City Environmental Agency's (DLH) official social media platform as a complaint channel has shown quite positive results. Social media is an effective and easily accessible communication tool for the public because it eliminates the need for complicated formal procedures. According to DLH data, there are an average of 85 interactions per month through official social media platforms related to pollution reports and environmental inquiries. The use of social media also allows the DLH to disseminate environmental information quickly and reach a wider audience, including younger generations who are active on digital platforms.

Third, the citizen complaint application, which has been integrated into the city government's digital platform, simplifies the system-based reporting process. Reports submitted through the application are digitally documented and can be monitored by the reporter. This system provides greater transparency in the complaint handling process than conventional reporting. However, observations indicate that the application's utilization rate among coastal communities, particularly fishermen, remains very low due to limited digital literacy and internet access in some coastal areas.

Fourth, face-to-face services at the Environmental Agency (DLH) office remain an important alternative for residents experiencing difficulties using digital services. Based on field observations, face-to-face services operate with relatively orderly procedures, and officers are generally responsive to residents who come in person to submit complaints or request information. However, the limited operating hours of face-to-face services (only on weekdays from 8:00 a.m. to 4:00 p.m. WIB) present a challenge for residents who require reporting outside of business hours, particularly for acute and urgent pollution incidents.

The biggest obstacle to the responsiveness of the Surabaya City Environmental Agency (DLH) lies in the limited human resource capacity of environmental supervisors. With only around 47 supervisors monitoring thousands of pollution sources across Surabaya's 350.54 km² area, the ratio of supervisors to monitored objects remains far from ideal. This situation causes delays in field response, especially for reports originating from areas far from the city center. Pratama & Nugroho (2021) found that limited human resources are the most significant obstacle to the effectiveness of environmental monitoring in major Indonesian cities.

Furthermore, limited environmental monitoring technology is a factor affecting response speed. Without a comprehensive, digital sensor-based water quality monitoring system, identification of pollution sources relies heavily on field inspections, which require significant time and resources. In comparison, Chen & Zhang (2023) noted that cities that have implemented IoT (Internet of Things)-based environmental monitoring systems have been able to reduce pollution source identification time by up to 65 percent compared to conventional methods.

From a public service theory perspective, responsiveness is measured not only by the availability of complaint channels but also by the organization's ability to provide prompt and appropriate follow-up to community needs. Research findings indicate that the Surabaya City Environmental Agency (DLH) has provided various complaint service channels that are relatively easy to access. However, the effectiveness of the response is still affected by the limited number of supervisory personnel and the suboptimal use of environmental monitoring technology. This situation indicates that increased service access has not been fully accompanied by increased organizational capacity. Therefore, strengthening human resources and digitizing the monitoring system are crucial for improving the quality of environmental service responses in a sustainable manner.

Effectiveness and Efficiency

Effectiveness and efficiency are the third dimensions of good governance, relating to the government's ability to achieve development goals through optimal resource utilization (UNDP, 1997). In the context of this study, the effectiveness and efficiency of Surabaya City Environmental Agency services were analyzed through four main indicators: program socialization, timeliness of implementation, accuracy of program targets, and real changes in environmental conditions.

In connection with the dissemination of the industrial monitoring program, the Surabaya City Environmental Agency (DLH) regularly holds coaching and outreach forums for business actors. According to DLH data, 24 outreach forums were held in 2024, attended by a total of 1,456 industry and business representatives. Topics discussed included wastewater quality standards, wastewater disposal licensing procedures, and the technical operations of wastewater treatment plants (WWTPs). Interviewed industry representatives stated that these outreach forums were quite helpful in improving understanding of waste management obligations, although their frequency and reach need to be increased to reach small-scale businesses spread throughout the city.

In terms of timeliness of implementation, water quality monitoring is scheduled periodically at all monitoring points established in the Surabaya City Environmental Agency's 2021-2026 Strategic Plan. Water Quality Index (IKA) measurements are conducted quarterly at 28 monitoring points spread across Surabaya's rivers and main waterways. According to the Environmental Agency's annual report, monitoring implementation has reached 94.6 percent of the target set for 2024, demonstrating a high level of compliance with the implementation schedule.

To ensure the program's target accuracy, the construction of communal wastewater treatment plants (WWTPs) is targeted at densely populated residential areas and vulnerable areas along riverbanks and coastal areas that lack independent wastewater treatment systems. Based on interviews and field observations, it was found that the location of communal WWTPs was determined by considering various technical and social factors, including population density, drainage conditions, water pollution levels, and community readiness for participation. The site selection process, which involved discussions with local residents, demonstrated efforts to ensure the program's effectiveness and support from the beneficiary community.

The most concrete aspect in assessing the effectiveness of DLH services is real changes in environmental quality, which can be seen from the following quantitative data:

Year	Water Quality Index (IKA)	Change in IKA (%)	Number of Communal IPAL (Units)	Change in WWTP (%)
2022	52	-	48	-

2023	55	5.77	56	16.67
2024	58	5.45	67	19.64
2025	61	5.17	79	17.91

Table 1. Water Quality Index (IKA) Trends and Development of Communal Wastewater Treatment Plants in Surabaya City 2022-2025

Source: Surabaya City Environmental Service (2025)

Table 1 shows that the Surabaya City Water Quality Index (IKA) has consistently increased during the 2022–2025 period. The IKA value increased from 52 in 2022 to 61 in 2025, representing a 17.31 percent increase over the four years of observation. During the same period, the number of communal wastewater treatment plants (WWTPs) increased from 48 to 79 units, representing a 64.58 percent increase. The positive correlation between the growth in the number of communal WWTPs and the increase in the IKA value indicates that the domestic wastewater treatment infrastructure development program has had a tangible and measurable environmental impact.

Upon further analysis, the increase in the IKA from 52 to 61 places Surabaya City from the moderate category to the good category based on the Water Quality Index assessment scale established by the Ministry of Environment and Forestry. However, a score of 61 remains below the good category, requiring more intensive efforts to achieve the minimum IKA target of 70 set in the Surabaya City Medium-Term Development Plan (RPJMD) for 2021-2026.

From a resource efficiency perspective, data shows that each additional communal wastewater treatment plant (WWTP) unit contributes an average of 0.28 points to an increase in the IKA. In a budgetary context, investing in communal WWTP construction has proven to be more cost-effective than post-pollution remediation efforts, which require significantly higher costs. This aligns with the principles of sustainable development, which emphasize the importance of a preventive approach to environmental management (WCED, 1987).

Analysis of the effectiveness of waste control programs also requires consideration of industry compliance with environmental quality standards. According to data from the Surabaya City Environmental Agency (DLH) in 2024, of the 1,200 industries monitored, 840 (70 percent) met established wastewater quality standards. This figure increased from 65 percent in 2022, indicating a positive trend in environmental compliance. However, 30 percent of industries still do not meet quality standards, posing a major challenge to comprehensive pollution control.

Factors contributing to increased program effectiveness include: (1) strengthening supervisory capacity through regular training for environmental supervisory officers; (2) the use of economic instruments in the form of stricter administrative sanctions and fines for violators of quality standards; (3) partnerships with universities and research institutions in water quality monitoring activities; and (4) community empowerment through the Climate

Village program which encourages active citizen participation in environmental management.

Meanwhile, factors that still hamper the effectiveness of the program include: (1) budget limitations that mean that not all priority points for communal wastewater treatment plant construction can be realized according to schedule; (2) limited capacity of water quality testing laboratories that have implications for queues for environmental sample testing; (3) low compliance of small and medium-scale business actors who do not yet have environmental permits; and (4) climate change that causes high rainfall variability that affects the concentration of pollutant parameters in water bodies.

Supporting and Inhibiting Factors for Implementation

An analysis of the implementation of the Surabaya City Environmental Agency's (DLH) services in controlling marine waste identified several significant supporting factors. First, the local government's political commitment, reflected in the steadily increasing budget allocation for environmental control programs, from Rp 45.2 billion in 2022 to Rp 62.8 billion in 2025. Second, the availability of a comprehensive regulatory framework, ranging from Law Number 32 of 2009 to regional regulations that support environmental law enforcement. Third, the synergy between the DLH and the Regional Disaster Management Agency (BPBD), the Health Office, and the Public Works Office in handling cross-sectoral pollution cases. Fourth, the active participation of coastal communities and civil society organizations in independent environmental monitoring.

On the other hand, several inhibiting factors were also clearly identified. First, limited human resources with a less-than-ideal supervisory ratio (47 supervisors for over 1,200 industries and thousands of potential pollutant points). Second, limited environmental monitoring technology, which still relies on manual methods for most monitoring activities. Third, suboptimal coordination with relevant agencies, particularly in handling pollution cases involving pollutant sources outside the administrative area of Surabaya City. Fourth, low compliance among small and medium-sized businesses that lack adequate waste management systems, which significantly contributes to the pollution load in water bodies.

CONCLUSION

Based on the research results and discussion, several conclusions can be drawn to address the stated research objectives. First, regarding the transparency of the Surabaya City Environmental Agency's services in controlling marine waste, this study found that transparency has been implemented at a fairly good level through the dissemination of policy and regulatory information through digital platforms and outreach forums. However, real-time accessibility of environmental technical data remains limited, and outreach to coastal communities and small businesses needs to be significantly improved.

Second, the responsiveness of the Surabaya City Environmental Agency's services can be categorized as quite good, indicated by the availability of a multi-

channel complaints system that includes a call center, social media, a digital complaint application, and face-to-face services. However, limited human resource capacity for supervisors (47 personnel across the city) and limited environmental monitoring technology are major obstacles to improving the speed and quality of responses to public reports.

Third, the effectiveness and efficiency of Surabaya City Environmental Agency services demonstrate positive and measurable achievements, as evidenced by the increase in the Water Quality Index (IKA) from 52 in 2022 to 61 in 2025 (an increase of 17.31 percent), as well as the increase in the number of communal wastewater treatment plants (WWTPs) from 48 to 79 units during the same period (an increase of 64.58 percent). This achievement is a new empirical research that confirms the positive relationship between the development of wastewater treatment infrastructure and improvements in water quality as an indicator of sustainable development.

Fourth, the implementation of Surabaya City Environmental Agency services is supported by the local government's political commitment, a comprehensive regulatory framework, cross-agency synergy, and community participation. However, it still faces obstacles such as limited supervisory human resources, limited monitoring technology, suboptimal cross-regional coordination, and low compliance among small and medium-sized businesses.

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