Article

Governance Assessment of Community-Based Waste Reduction Program in Makassar

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Abstract: Indonesia's government anticipates waste problems by managing them through a large number of waste reduction programs. From a governance perspective in Indonesia, it is known that actors from diverse governmental levels and across sectors are involved in waste management, and their involvement largely depends on their institutional goals and problems. Hence, they are expected to coherently collaborate by developing and implementing sustainable instruments and resources for improving waste management problems. However, it is necessary to understand how supportive or restrictive the governance of waste reduction programs is to encourage successful trash reduction. This study was designed to evaluate and examine the application of community-based solid waste management (CBSWM) in Makassar. In this research, the Governance Assessment Tool (GAT) was applied to analyze the governance context of the waste reduction programs in Makassar qualitatively. In the assessment, contexts can be described as either supportive or restrictive of the processes of implementing public policies on waste management. As a result of such an assessment, this study shed light on some opportunities to improve the governance of waste management implementation's impact on reducing waste in Makassar, South Sulawesi, Indonesia. The conclusion of this study is that the most important actors are affiliated with the local government and the community. Moreover, this study shows that the assessment of contextual governance is that it is predominantly restrictive.

Keywords: Governance Assessment Tool (GAT); waste management; community-based solid waste management (CBSWM); waste bank

1. Introduction

More than 55% of Indonesia's garbage is categorized as organic waste, with the remaining waste being non-organic [1]. The Waste Management Law was passed by the Indonesian government in 2008. To address Indonesia's issues with waste management, other rules, such as those of the Ministry of Environment Regulation(s), were most recently modified in 2021. However, Indonesian waste management practices have not been able to move beyond the "collect, transport, and dispose of the waste" model up to this point. In addition, Indonesian cities typically dispose of trash by depositing it in landfills [1,2].

Furthermore, Indonesia faces waste management challenges such as a lack of community involvement in policymaking, insufficient waste management capabilities, confined strategies, unsustainable long-term methods for managing waste, and a lack of coordination and cooperation between the government and the community [3,4]. The final section deals with the many actors engaged at multiple levels in Indonesia. The management of waste in Indonesia is supervised not only by the city government, but also at the national,

provincial, and local levels. There are numerous governance entities participating in waste management in urban areas in the city government [5,6]. They work together to develop community-based waste management policies and programs known as waste banks.

Waste banks (WBs) were established to engage the community in sorting non-organic garbage, which is a potential target for recycling in Indonesia. Recycling communities, such as WB communities, function as informal institutions established by citizens. These groups were developed to raise public awareness of the 3Rs and sustainability concepts of waste management. A WB's system is unique in that it is similar to a financial bank's system. Rather than saving money, WB users deposit recyclable waste and profit financially from the waste bank [7–12]. Makassar generates approximately 373,653.931 tons of waste per year [13]. This city has around 600 WBs spread across 15 districts, which are operated to combat unsustainable practices in waste management; however, only around 260 WBs (40%) are active [13].

This study, in particular, assesses the policy application of the WB as community-based solid waste management (CBSWM) in Makassar. According to Indonesian rules, the concept of the WB has become one of the solutions and offers a paradigm shift in waste management. The 3R concept (reduce, reuse, and recycle) is supposed to modify the end-of-pipe mindset [14]. Individuals are accountable for implementing waste management rules in their homes under the new paradigm [15]. Individual or specialized factors can influence waste sorting in each community [15]. It is envisaged that this research would contribute to advocating a change in the waste management paradigm by demonstrating the magnitude of the hurdles or support encountered in implementing the policy about community-based reduction.

It is therefore necessary to determine factors that encourage or hinder the implementation of this program and policy. The Makassar WB program has demonstrated the value of government intervention in municipal waste segregation schemes, particularly in enhancing community-based waste management, promoting community participation, and including all stakeholders [4,9,16,17].

Previous research has evaluated the effectiveness of waste management from a technical standpoint, such as assessing the impact of the existence of waste banks [17–19], but has neglected to study the success of policy implementation, which can be seen if it has been implemented, such as by paying attention to interactions with various actors [20]. The use of the GAT can fill this need.

The GAT has been used in the implementation of water, energy, and land use environmental policies [21–23]. With many uses of the GAT in diverse environmental management viewpoints, the GAT can also be utilized in community-based waste reduction programs, since waste is viewed as a resource in CBSWM [24]. This study is expected to provide a broad view of waste management policies at the source, as well as recommendations to governments struggling to improve waste management in their environment.

The following is how this article will be presented: at the outset, an introduction is provided that describes the challenges and issues that must be addressed through this research. It then goes on to explain how the GAT approach was used in this study. Following that, we provide a comprehensive analysis of the results and discussion, followed by a conclusion and future research at the end.

2. Research Methodology

This article employs the Governance Assessment Tool (GAT) [20] to assess policy implementation in order to determine if it supports or restricts the governance of CBSWM in a city. As a result, primary data were gathered from the outcomes of interviews with each stakeholder, which were conducted using simple questions as given in Table 1. In practice, these questions can be developed based on the facts of the situation. The core data for this study were gathered mostly through semi-structured, in-depth interviews. Meanwhile, secondary data were obtained from report data and related agency regulations. The following is a description of the research procedure (Figure 1).

Table 1. Governance dimension and governance quality matrix [20].

| Governance Dimensions	Governance Quality			
	Extent	**Coherence**	**Flexibility**	**Intensity**
Levels and scales	"Are all levels of government involved and dealing with the issue? Are there any important gaps or missing level?"	"Is there collaboration and trust at all levels? At what point is interconnectedness acknowledged?"	"Is it possible to upscaling or downscaling given the circumstances at hand?"	"Is there a strong effect on behavioral improvement or management reform at a certain level?"
Actors and networks	"Are all essential stakeholders represented? Who is not allowed?"	"What are the positive aspects of stakeholder interactions? Do the stakeholders have prior experience working collaboratively? Do they have mutual trust and respect for one another?"	"Is it possible that a fresh actor will be cast or led when there are practical reasons for doing so? Do the actors have "social capital" that allows them to help each other with their tasks?"	"Is there a strong impact from an actor or actor coalition towards behavioral change or management reform?"
Problem perspectives and goal ambitions	"To what extent are differing points of view regarded as a problem?"	"To what extent do the various goals complement one another?" Is there any rivalry or conflict?"	"Is it possible to re-evaluate the goals?"	"What is the status quo or Business, and how is it different between goal and ambitions?"
Strategies and instruments	"Are any tools being used in government strategy?"	"How many incentive programs are predicated on the presence or implementation of this program or policy? Are there any new conflicts or overlapping issues?"	"Are there any options for merging or utilizing other types of instruments that correspond to policy implementation?"	"What are the implicit behavioral deviations from the current implementation, and how stringent are the tools for requiring and enforcing it?"
Responsibilities and resources	"Are all duties and responsibilities clearly defined and supported by adequate resources?"	"To what extent do the given responsibilities foster competency struggles or cross-institutional cooperation? Do they have the support of the important stakeholders?"	"To what extent it is possible to pool the assigned responsibilities and resources as long as accountability are not compromised?"	"Is the amount of resources allotted sufficient to apply the required measure for the desired change?"
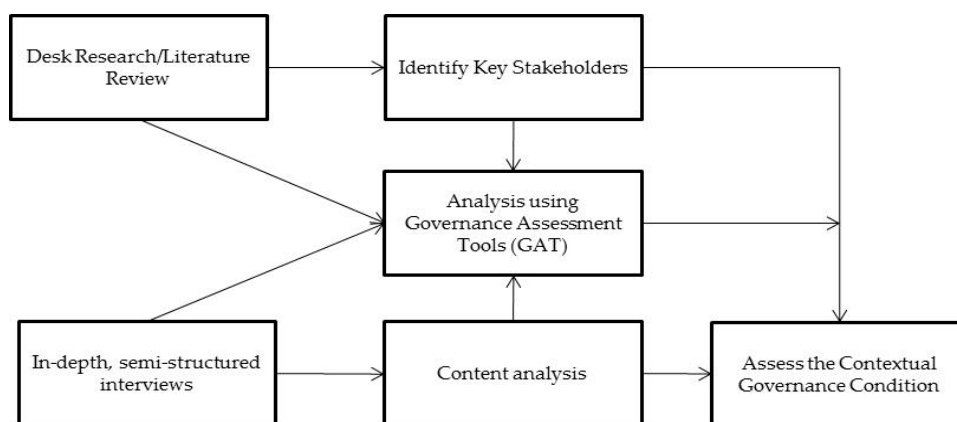
Figure 1. The procedure of the study.

The GAT is designed to provide a comprehensive understanding of the benefits and obstacles involved in policy implementation [22,25]. It might express the difficulties encountered in implementing connected policies or programs, regardless of whether the

conditions and techniques employed were favorable [26]. This assessment method comprises five governance dimensions that can be used to evaluate policy implementation, namely: level and scale, actors and networks, problem perspectives and goal ambitions, strategies and instruments, and responsibilities and resources. The GAT also employs four evaluation criteria to assess each dimension: extent, coherence, flexibility, and intensity [26]. The use of the GAT in this study is based on the following dimensions and criteria matrix.

To conduct a more complex GAT analysis, the parties to be interviewed must be determined. They were chosen based on information gleaned by observing the flow of CBSWM installation. In general, national, provincial, and municipal governments are involved in this management. Furthermore, as illustrated in Figure 2, parties outside of the government, such as NGOs, academics, and the commercial sector, support the execution of this strategy.
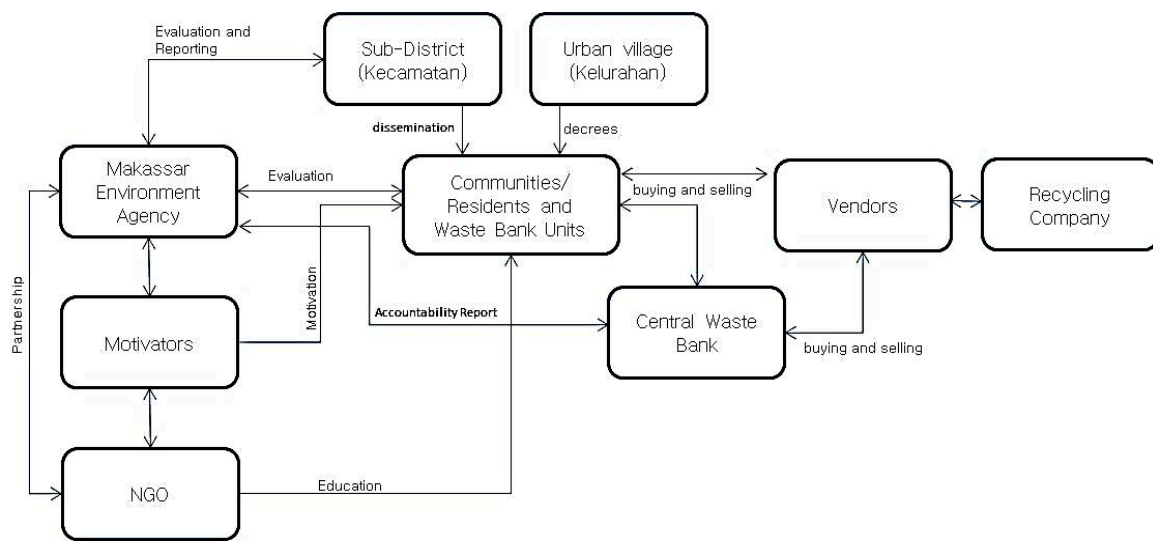

Figure 2. Waste bank activities.

Data were gathered specifically by combining waste-management-related questions. The acquired data were then analyzed using the GAT assessment matrix, as shown in Table 2.

Table 2. Assessment matrix of GAT [20,25].

Governance Dimension	Quality of the Governance System			
	Extent	**Coherence**	**Flexibility**	**Intensity**
Levels and scales	High: Each stakeholder believes that all levels of government are involved.	High: All levels collaborate.	High: The stakeholders believe that there is a potential of moving the levels depending on the issue.	High: Everyone is working collaboratively to change behavior or better management.
	Moderate: Each stakeholder believes that most of the levels of government are engaged.	Moderate: Most levels are collaborating, although some trust concerns have been reported.	Moderate: The stakeholders believe that there is a possibility of moving a level by reaching an agreement.	Moderate: The majority of levels are striving to influence behavioral change or managerial upgrades.
	Low: A minority of the groups are engaged.	Low: Some levels are absent or do not collaborate; the levels indicate some trust concerns.	Low: The stakeholders believe that there is no possibility of moving between levels.	Low: Only a small number of people are working to influence behavioral change or managerial reform.

Table 2. *Cont.*

Governance Dimension	Quality of the Governance System			
	Extent	**Coherence**	**Flexibility**	**Intensity**
Actors and networks	High: Every stakeholder is involved.	High: There is reciprocal confidence in all institutionalized and established connections.	High: There are chances to bring in new players, shift leadership, and exchange social capital.	High: There is effective collaboration among various players, which has the potential to have a significant impact on behavioral or managerial restructuring.
	Moderate: The majority of the stakeholders are engaged.	Moderate: They believe that most relationships are established and solid, but there are challenges in terms of trust between the parties involved.	Moderate: An actor network supports new actor involvement, and management transition, including social capital.	Moderate: Cooperation with a medium level of intensity. A limited number of players are attempting to have an impact on behavior or management transformation.
	Low: A minority of the public are involved.	Low: Certain interactions have become institutionalized and resilient, and there are challenges with reciprocal confidence.	Low: The actor network inhibits the participation of new actors, authority shifts, and the transfer of social capital.	Low: There is no stakeholder who has a substantial impact on behavioral change.
Problem perspectives and goal ambitions	High: The stakeholders believe that every perspective is represented.	High: All of the aims complement one another.	High: There is an opportunity for a review of aims.	High: The perspectives are usually in agreement on how to reach the goal and break free from the current status.
	Moderate: Certain people involved believe that the majority of opinions are represented.	Moderate: Most goals complement one another.	Moderate: Goals can be somewhat re-evaluated.	Moderate: More than half of the actors agree on their strategies for accomplishing the goal and moving away from the current status.
	Low: certain people believe that only a fraction of opinions are represented.	Low: Goals compete with one another.	Low: There is minimal room for goal re-evaluation.	Low: There is no widespread agreement among actors.
Strategies and instruments	High: There are no tools or strategies missing.	High: The framework enables policy instruments to collaborate and form teams. There are no instrument conflicts.	High: Various instruments can be blended.	High: For instruments that are strictly enforced. The prerequisite for behavioral divergence from existing practice is low.
	Moderate: Some tools or tactics are gone.	Moderate: This framework allows for the development of collaborative tools, although it has several shortcomings.	Moderate: Instruments can be mixed whenever it is indicated in a collaboration advancement.	Moderate: There is demand for behavioral deviation in specific operations, alongside compliance challenges in specific contents.
	Low: A significant number of tools or techniques are missing.	Low: This framework lacks opportunities for collaboration and there are disagreements on the execution of the instruments.	Low: Mixtures or multiple instruments cannot be used together.	Low: There are high levels of behavioral deviations in various compliance practices.

Table 2. *Cont.*

Governance Dimension	Quality of the Governance System			
	Extent	Coherence	Flexibility	Intensity
Responsibilities and resources	High: All obligations are clearly delineated, and appropriate resources are made available. Moderate: Most functions are clearly designated, although some have capabilities. Low: There are obviously delegated roles with insufficient resources.	High: Objectives promote organizational cooperation and ensure that assets are used appropriately. Moderate: Certain obligations promote organizational collaboration, but only small shares of assets are deployed continuously. Low: Organizational expertise and friction are created, and assets are not utilized effectively.	High: The assignments can be combined with an adequate monitoring system. Moderate: While it is conceivable to combine allocated roles, no effective control framework exists. Low: There is no way to integrate the tasks that have been allocated.	High: There are adequate assets to effect the intended improvements. Moderate: Certain assets are required to attain the intended results. Low: The amount of resources required to carry out existing tasks is inadequate.

Following the execution of the approach and analysis, the following more comprehensive results regarding the analysis may be explained.

3. Results

Table 3 summarizes the findings of the research, which were based on the results of interviews, observations, and literature searches. In summary, the GAT is divided into three primary categories: "Low", "Medium", and "High". The "+" sign denotes a condition in which CBSWM policy execution has begun to improve (towards high), whereas the "−" sign denotes an inadequate condition.

Table 3. Quality results of GAT assessment on CBSWM program in Makassar.

		Criteria			
		Extent	Coherence	Flexibility	Intensity
Dimension	Levels and Scale	+ (Medium)	(Low)	+ (Medium)	(Low)
	Actors and Networks	+ (Medium)	− (Medium)	(Low)	(Low)
	Problem Perspectives and Goal Ambitions	(Low)	(High)	(Low)	+ (Medium)
	Strategies and Instruments	(High)	(Low)	+ (Medium)	(Low)
	Responsibilities and Resources	(Low)	(Low)	− (Medium)	(Low)
	Assessed as	+ (Medium)	(Low)	+ (Medium)	(Low)

Based on the results of interviews and evaluations, the implementation of the CBSWM policy in Makassar is assessed as of low-to-medium quality. This is because, on the extent and flexibility criterion, the waste management policy implementation receives moderate support; however, the coherence and intensity of the CBSWM policy implementation in Makassar results in restrictiveness. Furthermore, in the level and scale dimensions, the quality of governance is classified as low to moderate. The same phenomenon also occurs in the actor and network dimensions. Supporting conditions exist in the dimensions of problem perspectives and goal ambitions, as well as methods and instruments, while the condition of responsibilities and resources is the lowest condition because it has three low (restrictive) criteria.

The key reason for support for the execution of the CBSWM policy in Makassar is cooperation among local stakeholders, which allows the CBSWM to run smoothly. Restrictions emerge as a result of bureaucratic issues at the provincial and national levels,

which can impede cities' abilities to communicate their ambitions to a higher level, causing the city level to be slightly restricted in enhancing CBSWM implementation through waste bank activities.

4. Discussion

4.1. Levels and Scale

This study's levels and scale dimensions produced balanced results. Two of the criteria yielded moderate outcomes, while the other two yielded low results. Extent and flexibility are favorable indicators because the implementation of CBSWM policy has increased from the national to the local government level, although participation at the provincial level is felt to be lacking. This deficiency causes inequality in terms of evaluation and support from the provincial level. Furthermore, even though the strict bureaucratic system is a barrier to policy execution, any participant can provide flexible input and be actively involved.

Environmental awareness on a worldwide scale has been introduced in Indonesia, pushing the government to adopt long-term plans. WBs are supported by national and regional regulations in Indonesia, where the Ministry of Environment organizes these programs. The achievement of proper waste bank operations in Indonesia is one of their assessment criteria [27]. However, it seems that only the city level is making maximum efforts to achieve this target, and bringing about changes in the paradigm and behavior of urban communities, which makes the intensity low.

4.2. Actors and Networks

In the actor and network dimensions, similar findings were found using various criteria. The criteria of extent and coherence yield modest outcomes in this dimension, while flexibility and intensity remain low. The breadth of policy implementation can be seen from the many actors at every current level, regardless of whether they have effectively carried out their tasks and obligations. So far, the relevant parties have sat in appropriate positions to assist the execution of the CBSWM policy in Makassar in particular. Furthermore, contact and consistency among Makassar's environmental agency and other stakeholders can aid in the successful dissemination and implementation of CBSWM policies in Makassar. Constraints in this dimension arise from the difficulty for decision makers to add new actors. This decision is left to the policy implementation leader.

Recycling companies are one set of actors who are not involved in the policy's execution in Makassar. The paucity of recycling businesses in this city impedes the flow of recycled materials. Because there is no recycling company in this area, there is no certainty that this program will be viable or continue in the future. The waste management hierarchy should include workable strategies, i.e., strategies that can reduce or eliminate waste in a more sustainable way before it is disposed of [28–31]. The absence of recycling companies that can have a direct impact and actively use landfills will only reduce waste recycling efforts [32]. When compared to Surabaya, another Indonesian city that also empowers residents for waste management, that region's program may be more sustainable there because the city has recycling companies [1].

4.3. Problem Perspectives and Goal Ambitions

There are different outcomes in this dimension for each criterion, such as the coherence criterion, which scores high because the various goals to be achieved are seen as a parallel series for the main goal, namely better waste management, despite the fact that each level of government has a different role at each level. The determination of policies and management objectives to be more sustainable is the result of the formulation of the national government [33]. This policy must be obeyed by every lower level of government.

The extent requirement, on the other hand, is seen as low, because the quick changes in political situations in Makassar have an impact on the aims to be reached. When the responsible party changes, so does the power that can be relied on to deliver the essential resources or facilities [4]. Similarly, the flexibility criterion is graded low since

demanding change necessitates consent from the highest level of government; in other words, politics plays a significant part in this transformation. This makes changing goals extremely difficult if the government in charge does not have the same vision as the prior government. The intensity of executing this policy, on the other hand, is moderate, because the waste reduction program can be carried out extensively through WBs. However, it has not properly attracted every citizen to participate in implementing more sustainable waste management.

4.4. Strategies and Instruments

The strategies and instruments dimensions, like the problem perspectives and goal ambitions dimensions, showed various disparities in each criterion. As evidenced by the supportive extent criterion, practically all significant tools, namely regulations, norms, policies/laws, programs, and initiatives, have been deployed, although, in some situations, law enforcement is still felt to be less stringent. In practice, the city administration collaborates with adjacent non-governmental organizations to deliver education through cooperative programs. Coherence is regarded as limited since law enforcement is not administered to its full extent, despite statutes governing administrative punishments for individuals who do not follow the norms. As a result, the emphasis has been solely on willingness to participate (the decision to be involved or not). This is also supported by socio-cultural aspects and other community conditions, such as local customs and the relationship between each group (those who sort and who do not), also being factors that influence the amount of waste that is generated and reprocessed [3,34].

This component has modest flexibility because although governance can integrate numerous instruments as long as they are properly regulated, inflexibility arises as a result of ambiguous encouragements for the region or community that has effectively adopted sustainable waste management in its territory. Furthermore, new instruments such as incentives will raise the budget, and the additional budget will have to be spent via the bureaucratic system.

Many people refuse to sort or bring their garbage to WBs, since they believe that they have already paid a charge to the government, so it is evident that the effective implementation of CBSWM requires a perceived need. Typically, the greatest need for improved waste collection is in residential districts, where population density is high and waste storage capacity is limited. The community believes that sorting rubbish is the responsibility of the government. Nonetheless, concern for waste management can increase if it is initiated by the community itself [35].

4.5. Responsibilities and Resources

There are three criteria on this dimension that were regarded as low: extent, coherence, and intensity. Because of Makassar City's inadequate resources, extent was regarded as modest. Furthermore, funding is now derived primarily from the municipal government budget, with no aid from other levels of government or outside entities. The coherence criterion was therefore deemed to be low due to a lack of assistance from the national and provincial level. The CBSWM programs in Makassar are centralized due to segmented activities with solid organization. This means that these programs are more effectively managed when the parties involved are in adjacent locations [35].

Due to a lack of human and financial resources, the intensity criterion was regarded as poor. Only those who participate in this program are willing to sort rubbish. Meanwhile, most rubbish is handled from house to house, producing friction among some people who are unwilling to segregate waste. Flexibility, on the other hand, was seen as modest because the roles of each player do not overlap. The ability to integrate the collaboration of numerous players at various levels has a high potential for implementation.

5. Conclusions

The limitation of this study is that varied interpretations of the meaning of the interview procedure can lead to biased outcomes. To avoid subjectivity, the results must be read by at least two persons. In addition, the triangulation process is carried out by cross-checking the data from this research with the facts from the interview results.

This study examines the implementation of community-based solid waste management (CBSWM) policies in Makassar, using the Governance Assessment Tool (GAT) as its instrument. According to the findings of the study, policy implementation was limited due to a lack of support from the stakeholders. This produces a bleak situation in this implementation, where implementers require higher-level direction and evaluation.

Furthermore, participation at a higher level is not conceivable. Parties at the lowest level must abide by the mentioned rules and bureaucracy. Another element impeding the implementation of this program is a lack of waste management legislation enforcement. Changes in thinking are usually simple, but in the case of Indonesia, the influence of political conditions, such as changes in leadership, is more powerful. The government has not been able to ensure appropriate facilities and resources for CBSWM. Makassar also lacks a recycling company that can assist in the conversion of garbage into more valuable resources.

Meanwhile, the local government's cooperation has succeeded in encouraging the implementation of 3R through waste banks (WBs) in Makassar. This party works with NGOs, the community, and the private sector to reduce garbage through the management of the waste. Cooperation with other parties ranges from providing facilities to drawing clear lines in the management of household waste.

If an integrated waste management system is required in the future, it is envisaged that collaboration with parties outside of Makassar will be possible. Aside from that, adopting CBSWM in Makassar requires more than simply community enthusiasm or motivation; it also requires backing from the government, commercial sector, and non-governmental organizations (NGOs). If the government wants to change the paradigm of society in the future, it must also apply the policies and instruments at its disposal.

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References

1. Damanhuri, E.; Handoko, W.; Padmi, T. Municipal Solid Waste Management in Indonesia. In *Environmental Science and Engineering (Subseries: Environmental Science)*; Springer: Singapore, 2014; pp. 139–155, ISBN 978-981-4451-72-7.
2. Damanhuri, E.; Padmi, T. *Integrated Waste Management*, 2nd ed.; ITB Press: Bandung, Indonesia, 2019.
3. Marshall, R.E.; Farahbakhsh, K. Systems approaches to integrated solid waste management in developing countries. *Waste Manag.* **2013**, *33*, 988–1003. [CrossRef] [PubMed]

4. Kubota, R.; Horita, M.; Tasaki, T. Integration of community-based waste bank programs with the municipal solid-waste-management policy in Makassar, Indonesia. *J. Mater. Cycles Waste Manag.* **2020**, *22*, 928–937. [CrossRef]

5. Pasang, H.; Moore, G.A.; Sitorus, G. Neighbourhood-based waste management: A solution for solid waste problems in Jakarta, Indonesia. *Waste Manag.* **2007**, *27*, 1924–1938. [CrossRef]

6. Towolioe, S.; Permana, A.; Aziz, N.; Ho, C.; Pampanga, D. The Rukun Warga-based 3Rs and waste bank as sustainable solid waste management strategy. *Plan. Malays.* **2016**, *14*, 31–44.

7. Nugraha, A.; Sutjahjo, S.H.; Amin, A.A. Analisis Persepsi Dan Partisipasi Masyarakat Terhadap Pengelolaan Sampah Rumah Tangga Di Jakarta Selatan. *J. Pengelolaan Sumberd. Alam dan Lingkung. (J. Nat. Resour. Environ. Manag.)* **2018**, *8*, 7–14. [CrossRef]

8. Kristina, H.J.; Layuk Allo, E.D.; Christiani, A.; Gandi, K. Analisis Indikator Keberhasilan Pencapaian Program Bank Sampah yang Berkelanjutan: Studi Kasus Bank Sampah Gemah Ripah Yogyakarta. In Proceedings of the Seminar Nasional Teknologi Industri (SNTI) ke-IV: Inovasi Teknologi Ramah Lingkungan untuk Penguatan Daya Saing Industri di Jakarta, Jakarta, Indonesia, 4–5 June 2014.

9. Wijayanti, D.R.; Suryani, S. Waste Bank as Community-based Environmental Governance: A Lesson Learned from Surabaya. *Procedia Soc. Behav. Sci.* **2015**, *184*, 171–179. [CrossRef]

10. Wulandari, D.; Utomo, S.H.; Narmaditya, B.S. Waste bank: Waste management model in improving local economy. *Int. J. Energy Econ. Policy* **2017**, *7*, 36–41.

11. Rahbil Fadly, S.A. *Study of Waste Bank Management as an Approach to Community-Based Waste Management*; Case Study of Garbage Bank in Manggala District; Universitas Hasanuddin: Makassar, Indonesia, 2017.

12. Ismawati, A. *Gambaran Partisipasi Masyarakat dalam Pengelolaan Sampah Pada Bank Sampah UKM Mandiri di RW 002 Kelurahan Tamamung, Kecamatan Panakkukang, Kota Makassar*; UIN Alaudin: Makassar, Indonesia, 2013.

13. Dinas Lingkungan Hidup Kota Makassar. *Laporan Kinerja Instansi Pemerintah (LKjIP) 2021*; Dinas Lingkungan Hidup Kota Makassar: Makassar, Indonesia, 2021.

14. Marwan, T. *Analisis Implementasi Kebijakan Bank Sampah di Kota Makassar*; Universitas Hasanuddin: Makassar, Indonesia, 2016.

15. Polyportis, A.; Mugge, R.; Magnier, L.B.M. *Understanding Householders' Perspectives on Sorting Plastic Waste*; TU Delft: Delft, The Netherlands, 2022.

16. Fatmawati, A.; Muhsin, M.A.; Taufik, A. Makassar Waste Bank Service Performance. *Makassar J. Innov. Public Serv.* **2019**, *1*, 1–15.

17. Purba, H.D.; Meidiana, C.; Adrianto, D.W. Waste Management Scenario through Community Based Waste Bank: A Case Study of Kepanjen District, Malang Regency, Indonesia. *Int. J. Environ. Sci. Dev.* **2014**, *5*, 212–216. [CrossRef]

18. Fatmawati, F.; Mustari, N.; Haerana, H.; Niswaty, R. Waste Bank Policy Implementation through Collaborative Approach: Comparative Study—Makassar and Bantaeng, Indonesia. *Sustainability* **2022**, *14*, 7974. [CrossRef]

19. Meidiana, C.; Sekito, T.; Sasongko, W. Determining Factors of Community Participation in Waste Bank. *IOP Conf. Ser. Earth Environ. Sci.* **2021**, *940*, 012085. [CrossRef]

20. Bressers, H.; Bressers, N.; Kuks, S.M.M.; Larrue, C. The Governance Assessment Tool and Its Use. In *Governance for Drought Resilience: Land and Water Drought Management in Europe*; Springer Open: London, UK, 2016; pp. 45–65. [CrossRef]

21. Casiano, C.; Tan, E.; Buntinx, I.; Crompvoets, J.; Stöcker, C. Land Use Policy Governance assessment of the UAVs implementation in Rwanda under the fit-for-purpose land administration approach. *Land Use Policy* **2020**, *99*, 104725. [CrossRef]

22. Bressers, H.; Özerol, G. Can water resilient city strategies and projects be realized in practice? The Governance Assessment Tool. In Proceedings of the ECPR General Conference 2020 Advances in Water Governace, Virtual, 24–28 August 2020; pp. 1–21.

23. Mirnezami, S.J.; de Boer, C.; Bagheri, A. Groundwater governance and implementing the conservation policy: The case study of Rafsanjan Plain in Iran. *Environ. Dev. Sustain.* **2020**, *22*, 8183–8210. [CrossRef]

24. Nugraheni, S.; Poerbonegoro, A.F.; Mokoginta, I.S. *Community-Based Solid Waste: The Case of Bank Sampah*; Universitas Katolik Parahyangan: Kota Bandung, Indonesia, 2013; pp. 1–9.

25. Flores, C.C. *Context Matters: Water Governance Assessment of the Wastewater Treatment Plant Policy in Central Mexico*; University of Twente: Enschede, The Netherlands, 2017; ISBN 9789036543224.

26. Bressers, H.; Boer, C.D.; Lordkipanidze, M.; Ozerol, G.; Vinke-De Kruijf, J.; Furusho, C.; Lajeunesse, I.; Larrue, C.; Ramos, M.-H.; Kampa, E.; et al. *Water Governance Assessment Tool: With an Elaboration for Drought Resilience*; DROP Governance Team: Enschede, The Netherlands, 2013; pp. 1–42.

27. Raharjo, S.; Matsumoto, T.; Ihsan, T.; Rachman, I.; Gustin, L. Community-based solid waste bank program for municipal solid waste management improvement in Indonesia: A case study of Padang city. *J. Mater. Cycles Waste Manag.* **2017**, *19*, 201–212. [CrossRef]

28. Cheremisinoff, N.P. *Handbook of Solid Waste Management and Waste Minimization Technologies*; Elsevier Science: New York, NY, USA, 2003; ISBN 0750675071.

29. Shrestha, Z. *The Integration of Circular Economy into the Municipal Solid Waste Management of Kathmandu Metropolitan City in Nepal*; University of Twente: Enschede, The Netherlands, 2018.

30. Andersen, M.S. An Introductory Note on The Environmental Economics of The Circular Economy. *Sustain. Sci.* **2007**, *2*, 133–140. [CrossRef]

31. The Ellen MacArthur Foundation. *Towards the Circular Economy*; The Ellen MacArthur Foundation: Wight, UK, 2013.

32.　Zafaranlouei, N.; Jafarzadeh, S.; Gholamreza, G. Assessment of sustainable waste management alternatives using the extensions of the base criterion method and combined compromise solution based on the fuzzy *Z*-numbers. *Environ. Sci. Pollut. Res.* **2023**, *30*, 62121–62136. [CrossRef] [PubMed]

33.　Ratnawati, R.V. The Implementation Of Circular Economy in Indonesia Indonesia Best Practices EU-Indonesia. In Proceedings of the EU-Indonesia Business Dialogue, Jakarta, Indonesia, 25 October 2018.

34.　Van de Klundert, A.; Anschutz, J. *Integrated Sustainable Waste Management—The Concept: Tools for Decision-Makers: Experiences from the Urban Waste Expertise Program*; WASTE: Couda, The Netherlands, 2001; ISBN 9076639027.

35.　Anschutz, J. *Community-Based Solid Waste Management and Water Supply Projects: Community Participation in Waste Management, Problems and Solutions Compared*; WASTE: Couda, The Netherlands, 1996.