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A Broken Separation Chain: Implementing Household Waste Separation Policy in an Indonesian Urban Village

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ABSTRACT

Source-separation policies make households the starting point of waste management, but their success depends on the links that follow: collection, temporary disposal sites (TPS), and the rules applied at each point. This study examines how a household waste-separation programme was implemented at urban-village (kelurahan) level, which obstacles arose, and how the village responded. Using Edwards III's implementation model, we conducted a qualitative case study of the Kang Pisman programme in one urban village in Bandung, Indonesia, drawing on in-depth interviews with the village head, a section head, a neighbourhood head, and a resident in January and February 2025, together with observation and documents. Outreach was intensive and consistent, and the section head estimated that about 70 percent of residents separated their waste. The separation chain nevertheless broke at three points outside the household: organic processing sites were missing, collectors remixed separated waste, and one neighbourhood avoided the village TPS, which required separated waste, by using an agency TPS that did not. Budgets were small and at one point halted, collectors' pay was low, and the decree defining the programme structure could not be found. The village responded with corporate partnerships, maggot-cultivation income for collectors, and holding back unseparated waste. We propose the concept of a broken separation chain and argue that the bureaucratic-structure dimension of Edwards III's model should be read as the consistency of standards along the service chain. Findings rest on four informants and are transferable rather than generalizable.

Keywords: Policy Implementation; Source Separation; Street-Level Bureaucracy; Exit Option; Urban Village Governance

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INTRODUCTION

Urban solid waste is among the most visible public service problems in developing countries. The World Bank projects that global waste generation will keep rising with population growth and urbanization (Kaza et al., 2018). In Indonesia, Law No. 18 of 2008 on Waste Management shifted the paradigm from collect, transport, and dump towards reduction and handling at source, and Presidential Regulation No. 97 of 2017 set a national policy and strategy for household waste in which reduction and separation at source are central pillars. Separation at source is also one of the practical routes through which cities can contribute to the sustainable consumption and production targets of the 2030 Agenda (United Nations,

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2015), which makes its implementation a question of sustainable governance and not only of municipal housekeeping.

Bandung offers a sharp illustration of the pressure on cities. The city sent on average about 1,300 tonnes of waste a day to the Sarimukti landfill (Ripaldi, 2024). According to 2023 data from the city's Environment and Sanitation Agency compiled for this study, food waste accounted for 716.51 tonnes a day, plastic for 268.83 tonnes, and paper for 211.2 tonnes, with the remainder made up of hazardous waste, textiles, wood, rubber, leather, and metal. The crisis peaked when the Sarimukti landfill caught fire on 19 August 2023 (Pradana, 2023). After the fire, the amount sent to Sarimukti fell by about 400 tonnes to 900 tonnes a day, while some waste could not be sent at all and accumulated in the city (Ripaldi, 2024). In October 2024, the city government announced that unseparated household waste would no longer be collected and asked local officials at disposal sites to ensure that waste arriving there had been separated (Primananda, 2024).

One of the city's main instruments for promoting separation at source is the Kang Pisman programme, an acronym of the Sundanese-Indonesian words for reduce, separate, and utilize. Several studies indicate that its local implementation remains weak. Fatrianingsih et al. (2022) found that in Sukamiskin urban village the programme was constrained by residents' low awareness of separation and by a lack of facilities, especially land. Astuti and Kamil (2024) reported that in Pasirlayung urban village, waste policy implementation was held back by limited funds, uneven performance of implementers, weak external communication, and low participation in waste banks. A material-flow study of plastic waste in several Bandung neighbourhoods estimated that more than half of household plastic ended up in landfill, about 25 to 30 percent was separated at source, and about 12 percent was not collected at all. The same study found that separation initiatives at neighbourhood (rukun warga, RW) level were the most influential factor in separation rates, while limited infrastructure and collection capacity encouraged burning and dumping (Frigo et al., 2025). A comparison of Bandung, Yogyakarta, and Magelang also showed that plastic waste moves through several collection routes, the environment agency, community waste banks, and private firms, which are not fully integrated (Zahrah et al., 2024).

Implementation studies at urban-village level tend to explain the failure of separation with the same two factors, residents' awareness and limited resources, while intervention studies show that labels, information, and campaigns can improve household knowledge and practice (Sembiring et al., 2024). These explanations are correct but incomplete. The international literature shows that household separation depends heavily on enabling conditions such as facilities and collection systems, not only on residents' socio-economic characteristics (Dhokhikah et al., 2015), and that the performance of a city's waste system depends on the integration of the whole chain from source to final treatment (Wilson et al., 2012). Although considerable attention has been paid to whether households separate their waste, less attention has been paid to what happens to separated waste once it enters the next link, and to how actors in those links, who are often absent from policy design, shape implementation outcomes.

This study addresses three questions: (1) how was the household waste-separation policy implemented at urban-village level; (2) what obstacles did implementation face; and (3) what measures were taken to address them? Using Edwards III's (1980) model, read together with the literature on street-level bureaucracy (Lipsky, 2010) and the concept of exit (Hirschman, 1970), we argue that separation fails not only in households but also in the links that follow. The article makes three contributions. Empirically, it identifies where separation breaks down outside the household in an Indonesian urban village. Conceptually, it proposes the notion of a broken separation chain, which links implementation studies with the literature on waste management systems. Theoretically, it suggests that the bureaucratic-structure dimension of Edwards III's model should cover the consistency of standards across organizations and across the links of a service chain. The article continues with the literature review, the policy context and methods, the results and discussion, and the conclusions.

LITERATURE REVIEW

Edwards III's Implementation Model

Edwards III (1980) explains policy implementation through four interacting factors. *Communication* covers the transmission, clarity, and consistency of policy messages to implementers and target groups. *Resources* include staff, budgets, facilities, information, and authority. *Disposition* concerns the attitudes and commitment of implementers, including the incentives that shape them. *Bureaucratic structure* covers standard operating procedures (SOPs) and fragmentation, that is, the spread of responsibility across several units. The model is widely used in Indonesian studies of waste policy because its dimensions are easy to operationalize at local level. Its weakness is that it tends to read all four factors within a single implementing organization, which makes it less sensitive to problems arising between organizations or between the links of a service chain. O'Toole (2000) stresses that public

policy is usually implemented in multi-actor structures and that success depends on coordination among interdependent organizations. Hill and Hupe (2014) likewise argue that implementation should be analysed at several layers, because action at one level of government can be neutralized by action at another level or in another organization.

Waste as a Chain

Wilson et al. (2012) compared waste management in 20 cities and showed that system performance depends on interlinked physical components (collection, treatment, disposal) and governance components (inclusivity, financial sustainability, and institutions). In a study of 300 households in Surabaya, Dhokhikah et al. (2015) found that enabling factors such as facilities and systems mattered more for participation in waste reduction than residents' socio-economic characteristics. Knickmeyer (2020) reviewed the social factors that influence household separation in urban areas and the practices that improve the recycling performance of cities. Wilson et al. (2006) showed that in developing countries the informal sector plays a large role in material recovery, so that actors outside formal government structures help determine what happens to waste after it leaves the household. Together, these studies suggest that separation at source is the beginning of a chain and that its value depends on whether later links preserve it.

Street-Level Bureaucrats and the Exit Option

Lipsky (2010) shows that frontline public workers, operating with limited resources and heavy workloads, develop simplifying routines that in practice determine how policy is carried out. Tummers et al. (2015) classify such responses as coping strategies, including moving away from the demands of a policy so that the workload remains manageable. In waste management, poorly paid collectors working with limited equipment occupy exactly this position. Hirschman (1970) distinguishes two responses to declining quality or to burdensome rules: exit, by moving to an alternative, and voice, by objecting from within. When a laxer alternative is available, exit becomes cheap. The concept helps to interpret the behaviour of neighbourhood units, such as an RW, that can choose between disposal points with different rules.

Conditional Cooperation

Separation at source is a contribution by residents to a public good, a clean environment. Fischbacher et al. (2001) showed experimentally that many people cooperate conditionally, contributing as long as others also contribute. Frey and Jegen (2001) added that external interventions, including sanctions, can either strengthen or crowd out intrinsic motivation, depending on how they are perceived. In the context of separation, residents who see their separated waste being remixed receive a signal that the system does not reciprocate their effort, which weakens the basis for conditional cooperation.

Analytical Framework

The study uses Edwards III's four dimensions as analytical categories. Findings for each dimension are then read with two additional questions: whether the separation standard is maintained at each link (collection, transport, and TPS), and whether alternative routes allow implementers or residents

to avoid the standard. Obstacles and measures are analysed as responses to breaks in this chain. Fig. 1 shows the separation chain intended by the policy and the break points found in this study.

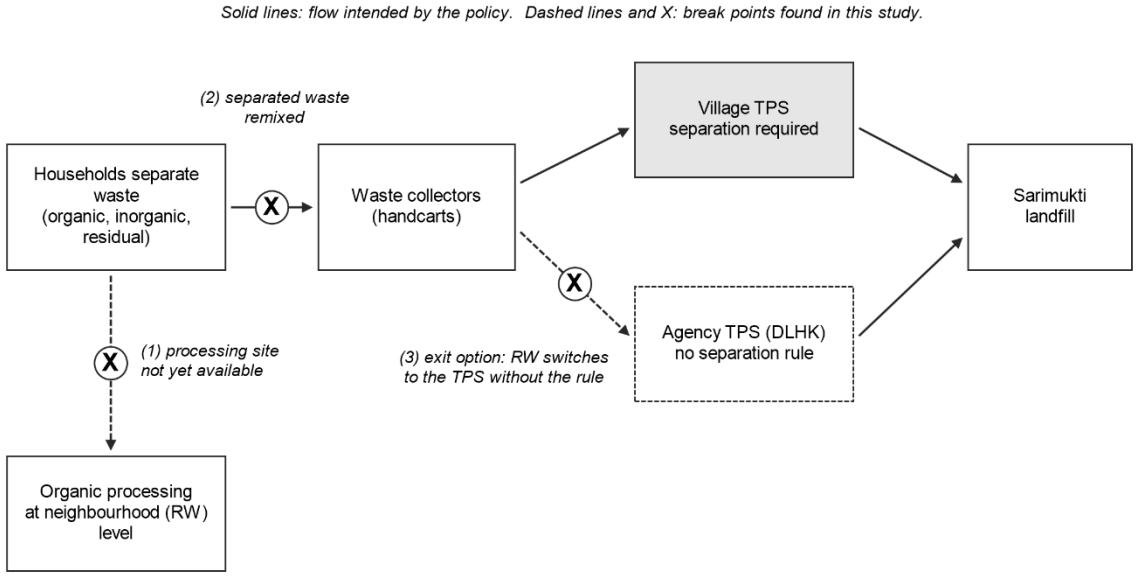

Fig. 1 The separation chain intended by the policy and the break points found in this study (authors' elaboration from research data)

MATERIALS AND METHODS

Policy Context

Law No. 18 of 2008 states that household waste management consists of reduction and handling, including separation. Minister of Home Affairs Regulation No. 33 of 2010 on Guidelines for Waste Management divides responsibility so that management from source to TPS rests with the community, while management from TPS to landfill rests with local government. At city level, Bandung Regional Regulation No. 9 of 2018 on Waste Management provides the legal basis.

The Kang Pisman programme was launched by the Bandung city government in 2018 as a development of the 3R concept (reduce, reuse, recycle) framed in Sundanese language and culture. Residents are asked to reduce waste, to separate it into three categories (organic, inorganic, and residual), and to use organic waste through biopores, composters, Takakura baskets, biodigesters, black soldier fly maggots, or animal feed, and inorganic waste through waste banks or waste donations. Residual waste goes to the TPS for transport to the landfill. The programme is coordinated by the Environment and Sanitation Agency (DLHK) and, according to documents compiled for this study, initiated waste-free areas in 143 locations across 30 districts. In October 2025, the city announced plans to recruit 1,597 separation facilitators, one for each RW, on the principle that organic waste would no longer be collected and would have to be processed within the RW (Kurniawan, 2025).

The case is located in Gedebage district, which according to population data compiled for this study had 42,071 inhabitants on about 9.78 km², a density of about 4,400 people per km². The urban village studied had 12,016 inhabitants in 2023 (6,009 men and 6,007 women) on 276.57 hectares, and comprised 12 RW and 67 neighbourhood associations (RT). It produced about 12 tonnes of waste a day. The village managed a TPS on land owned by the city government, with the rule that waste from all RW had to be separated before disposal. In the same area, a TPS managed by DLHK did not require separation.

Research Design and Case

We used a qualitative descriptive approach with a single case study design of the Kang Pisman programme in Rancabolang urban village, Gedebage district, Bandung. The village was selected as an informative case (Seawright & Gerring, 2008). It operated a TPS with a strict separation rule, while an agency TPS without such a rule was available nearby, so that the interaction between source-separation

policy and the links that follow could be observed. A single case is not intended for statistical generalization but for developing a concept that can be examined in other cases.

Informants and Data Collection

Informants were selected purposively for their role in the programme (Table 1) and are referred to by codes.

Table 1. Research informants

Code	Role	Interview date
I1	Head of the urban village (lurah)	7 January 2025
I2	Head of the economic and development section	7 January 2025
I3	Head of RW 04	12 February 2025
W1	Resident of RW 04	12 February 2025

Source: research data, 2025.

Data were collected through in-depth interviews with a semi-structured guide organized around Edwards III's dimensions, obstacles, and measures; preliminary observation of separation practices and facilities in several RW; and documents, including the village profile and records of outreach activities. Interviews were held in Indonesian, and the excerpts below were translated by the authors.

Data Analysis and Trustworthiness

Analysis followed the stages of data condensation, data display, and conclusion drawing and verification (Miles et al., 2014). Edwards III's dimensions served as deductive categories, while themes on obstacles, measures, and breaks in the separation chain were developed from the data. Credibility was supported by source triangulation (village officials, RW, and resident) and method triangulation (interviews, observation, and documents), following the criteria of trustworthiness for qualitative research (Lincoln & Guba, 1985). Table 2 shows how the dimensions were operationalized in coding.

Table 2. Operationalization of the analytical dimensions

Dimension	Indicators	Main data sources
Communication	Transmission, clarity, consistency	Interviews I1, I2, I3, W1; outreach records
Resources	Staff, budget, equipment	Interviews I1, I2, I3; observation of facilities
Disposition	Implementer commitment, resident motivation, incentives	Interviews I1, I2, W1
Bureaucratic structure	SOPs, organization and division of tasks	Interviews I1, I2, I3; village documents
Separation chain (added)	Consistency of standards in collection, transport, and TPS; availability of alternative routes	All data

Source: authors' elaboration.

The second author lives in the same RW as the RW informant and the resident. This proximity eased access but may also have influenced informants' answers and the researchers' interpretation. We addressed this by comparing RW accounts with those of village officials and with observation, and by reporting tensions between accounts rather than smoothing them over.

Research Ethics

The research was conducted with a research permit from the authors' institution addressed to the urban-village government. Informants took part voluntarily, and their identities are replaced by codes.

RESULTS AND DISCUSSION

The results follow Edwards III's four dimensions and then turn to obstacles and measures. Table 3 summarizes the findings and the break points identified for each dimension. The discussion that follows

interprets these findings through the notions of a broken separation chain, street-level bureaucracy, and exit.

Communication

Transmission. The village relied on outreach through social media, face-to-face meetings, and training. I2 explained:

> *"On communication, we have made many efforts to inform the community about the Kang Pisman programme. Information is spread through various channels, such as social media and face-to-face meetings held repeatedly. In this way we hope people understand the importance of separating waste according to the policy. But there are still obstacles in reaching all residents, because not everyone attends the outreach or actively looks for the information provided." (I2)*

At RW level, I3 described the frequency of activities:

> *"Outreach is frequent. In the past year there have been about five outreach and training sessions for residents of RW 4 on the Kang Pisman programme and waste separation." (I3)*

Clarity. Repeated outreach did not fully produce clear understanding. I2 estimated the level of separation:

> *"Outreach has been repeated so that people understand the importance of separating waste. But some residents still feel confused or do not understand the steps. At the moment, about 70 percent of residents already separate their waste properly, but the other 30 percent are not yet doing it optimally." (I2)*

On the residents' side, confusion was linked to the absence of a place to process waste:

> *"For outreach, there is already a circular from the RW about Kang Pisman, for example about separating organic waste to be processed. But sometimes I am confused about how to process it, because there is no place here to process it. So sometimes I just know about it, but I have not fully separated." (W1)*

Consistency. The village repeated the same message, with the rule that waste entering the village TPS had to be separated:

> *"We never tire of reminding residents to separate waste, through social media and in meetings, with consistent guidance on why it matters. [...] We also stress that waste brought to the Rancabolang village TPS must already be managed, with organic and inorganic waste separated, and this is the main point in every outreach session. Even so, some residents still find the technical side of separation troublesome, so stronger sanctions and more effective approaches are needed." (I2)*

Communication from the village was therefore intensive and consistent but did not reach all residents. The remaining lack of clarity concerned not only the message but also facilities: residents were asked to separate organic waste for processing while no processing site existed in their neighbourhood.

Resources

Human resources. The main issue was not the number of village staff but the involvement of RT and RW leaders as the programme's extension:

> *"Community awareness and the active involvement of RT and RW are key factors for the success of Kang Pisman, and at the moment they are still lacking. Repeated outreach, through meetings and social media, still needs stronger follow-up to achieve full understanding and participation." (I2)*

> *"In practice, lack of community awareness and weak sanctions are the main obstacles that make implementation ineffective, and the limited role of RT and RW in guiding their residents is also an important factor." (I1)*

Budget. Government funding was considered insufficient, and residents' fees were hard to collect:

> *"In terms of budgeting, although we receive government support, the funds are still not enough for waste management needs. We also have to look for additional funds from other sources, especially for programmes such as waste banks, separated bins, Takakura baskets, maggot cultivation, composters, and biopores." (I2)*

> *"Residents find it hard to pay the waste management fee because of a lack of awareness, so operating costs are often a problem." (I3)*

Equipment. The village provided separated bins in every RW and a TPS on city-owned land:

> *"In every programme in Rancabolang we try to provide items that support Kang Pisman, such as separated bins in every RW. We also have a temporary TPS on land owned by the Bandung city*

government that is managed by the village. Waste from all RW must already be separated before it is dumped at this TPS." (I2)

Donated facilities did not last, however:

"There has been government assistance in the form of carts, separated bins, and other facilities distributed to every RW, but after distribution some RW were less able to maintain them, so they did not last and were damaged." (I1)

"There have been facilities from the government such as carts and separated bins distributed to every RT, but some individuals in the community damaged them. I have investigated but have not yet found out who they are." (I3)

Programme resources were thus available at village level but weakened at RW level: leaders were less involved, fees were hard to collect, and facilities were damaged through neglect or vandalism.

Disposition

Commitment among village officials appeared high but was uneven at RW level:

"We are always committed to increasing community participation, but the lack of support from some RW and the incomplete commitment of implementers at RW level are challenges that must be overcome, although there has been some progress." (I2)

"Residents' motivation to take part is sometimes still low, so we keep trying to provide education and incentives to increase participation." (I1)

The resident supported the programme's aims but found separation troublesome:

"I support Kang Pisman, especially if the waste can be used. But I find separating waste quite troublesome. It would be better if waste could simply be put together, because separating often feels complicated and sometimes smells. If there were an easier and more practical system, we might take part more enthusiastically." (W1)

Bureaucratic Structure

SOPs. The village stated that it followed the SOP and the rule that waste entering the village TPS had to be separated:

"In implementing this programme we always refer to the established SOP, including instructions from our superiors and the rule that waste dumped at the Rancabolang TPS must be properly managed, meaning organic and inorganic waste must be separated, although some RW have not fully followed this rule." (I1)

The most important finding on this dimension came from I2, who described how the separation chain broke in the hands of collectors:

"The SOP and its legal basis are in place. In Kang Pisman, the main thing is that after outreach to residents we continue with outreach to the waste collectors, because both play important roles. Residents collect waste at home, while collectors take it to the TPS. But it often happens that waste already separated at home is mixed again by the collectors. So the SOP must be firmly enforced from the home, through collection by the waste collectors, to the transfer to the TPS. The process must run consistently from upstream to downstream so that the results are connected and integrated." (I2)

Organization and division of tasks. The programme was managed by the economic and development section, involving village staff, waste collectors, and RW sanitation sections. Its formal basis, however, was unclear:

"The organizational structure remains at village level, with operations managed by the head of the economic and development section. At RW level, various parties are involved, including waste collectors and the sanitation section of each RW. Structurally, the decree on Kang Pisman at village

level may need to be reviewed, because no clear document has been found so far; it may have been stored somewhere poorly organized." (I1)

The head of RW 04 explained that the RW did not use the village TPS:

"RW 4 does not join the Rancabolang village TPS because it is a hassle: waste has to be held and separated first, unlike the DLHK TPS, which does not require separation." (I3)

This excerpt shows that the separation rule at the village TPS did not bind all RW, because another TPS with a laxer standard was available.

Table 3. Summary of findings by Edwards III's dimensions

Dimension	Main findings	Break point in the separation chain
Communication	Repeated outreach through social media, meetings, and training; about five sessions a year in RW 04; about 70 percent of residents separating according to I2	Residents asked to process organic waste without a processing site
Resources	Separated bins per RW and a village TPS available; insufficient budget; fees hard to collect; facilities damaged	Facilities at RW level not maintained
Disposition	High commitment at village level; uneven commitment in RW; resident finds separation troublesome	Weak incentives for residents and RW implementers
Bureaucratic structure	Separation SOP applied at the village TPS; programme decree not found	Collectors remix separated waste; an RW switches to the DLHK TPS without a separation rule

Source: research data, 2025.

Obstacles and Measures

The data point to four main obstacles. First, the village waste budget was very small and was at one point halted because of government budget cuts, which limited facilities, training, and equipment. Second, collectors' low pay reduced their motivation and performance, although they play a key role in transport and separation. Third, some residents did not separate their waste as required, a problem worsened by weak sanctions. Fourth, there was no clear programme structure, because no letter of assignment set out the division of tasks, which weakened coordination among implementing units.

The village took four measures (Table 4). It encouraged innovation by its staff and partnered with private firms through corporate social responsibility (CSR) programmes to fund facilities such as separated bins. The products of maggot cultivation on organic waste were used to raise catfish and ducks and to fertilize a village-managed garden, and the proceeds supplemented collectors' income. The village monitored waste from households to the TPS, returning or holding back waste that had not been

separated until it was. Village staff, especially the economic and development section, managed outreach, distributed equipment, and supervised RW.

Table 4. Obstacles and measures

Obstacle	Measure taken
Minimal budget, at one point halted	CSR partnerships for funding and facilities
Low pay for waste collectors	Sale of maggot-cultivation products to supplement collectors' income
Some residents not separating; weak sanctions	Close monitoring; unseparated waste returned or held at the TPS
Unclear programme structure and assignment letters	Management and supervision by village staff and the economic and development section

Source: research data, 2025.

A Broken Separation Chain

The explanation most often given for the failure of separation is low awareness among residents, and our data contain that explanation too. The case shows, however, that separation can fail at no fewer than three points outside the household. The first is processing: residents were asked to separate organic waste for processing while no processing site existed nearby. The second is transport: waste separated by residents was often remixed by collectors. The third is the TPS: one RW chose to use the DLHK TPS, which did not require separation, so the rule of the village TPS did not apply to its residents.

We call this pattern a broken separation chain. In such a chain, household compliance is wasted physically, because separated waste is mixed again, and motivationally, because residents can see that the system does not value their effort. The finding is consistent with Wilson et al. (2012), who emphasize the integration of the whole waste system, and with Dhokhikah et al. (2015), who show that enabling factors matter more for participation than residents' characteristics. The contribution of the case is to show concretely where the chain breaks in the setting of an Indonesian urban village. It also complements Frigo et al. (2025), who found that RW-level initiatives were the strongest influence on separation rates in Bandung: the present case shows that such initiatives can be neutralized by links beyond the RW's control.

From the perspective of conditional cooperation (Fischbacher et al., 2001), the remixing of separated waste tells residents that their contribution is not reciprocated. The resident's statement that separation is "troublesome" and that the resident "just know[s] about it" without having "fully separated" cannot be detached from the fact that no processing site existed in that neighbourhood. Part of the non-compliance that village officials read as low awareness may therefore reflect the failure of the system to reward compliance.

Waste Collectors as Street-Level Bureaucrats

Waste collectors are not named as key actors in the programme design, yet the data show that they decide whether separation survives. They work for low pay, and according to the obstacles reported, their motivation fell because of poor compensation. Lipsky (2010) explains that frontline workers with limited resources tend to simplify tasks to keep their workload manageable. Remixing separated waste can be read as such a simplification, or in the typology of Tummers et al. (2015) as coping by moving away from the demands of the policy, although our data do not include collectors' own explanations. A similar problem has been reported in China, where after mandatory separation was introduced, separated food waste was less often remixed in cities able to provide dedicated vehicles, but remixing remained common elsewhere and was hard to detect because assessments rated districts and communities rather than haulers working across them (Jiang, 2022). In both settings, accountability for separation falls on residents, while the transport link largely escapes scrutiny.

The village's decision to sell maggot-cultivation products to supplement collectors' income addresses the root of this problem, because it links collectors' incentives to the success of organic processing. Edwards III's model places incentives under disposition, but the case shows that the disposition that matters is not only that of village officials but also that of workers in the transport link.

Double Standards and the Exit Option

The decision of RW 04 not to use the village TPS because waste had to be separated first, and to switch to the DLHK TPS that did not require separation, is an instance of exit in Hirschman's (1970) sense. When two disposal points apply different standards, the stricter rule can easily be avoided by

moving to the laxer one. Enforcement at the village TPS, including holding back unseparated waste, was therefore effective only for RW that chose to keep using it. Stricter enforcement at one point may even push more RW to leave.

The finding bears on later city policy. In October 2024 the city announced that unseparated household waste would not be collected and asked local officials at disposal sites to check that waste had been separated (Primananda, 2024). From the perspective of the separation chain, a uniform city-wide rule could close the exit option found in this study, provided it also applies at agency-managed TPS. This study cannot assess how that policy was implemented, because data were collected shortly after it was announced. The city's October 2025 plan to place a separation facilitator in every RW and to stop collecting organic waste (Kurniawan, 2025) moves in the direction suggested by our findings, shifting attention from residents' awareness to the organization of links at RW level. Its success will depend on whether the same standard also applies to collectors and to every TPS.

Bureaucratic Structure as Consistency along the Service Chain

In Edwards III's model, bureaucratic structure is usually operationalized as the existence of SOPs and a clear division of tasks within the implementing organization. The case shows that an SOP can exist and be understood at village level yet still fail, because it is not followed in another link (the collectors) and does not apply in another organization (the DLHK TPS). The absence of a decree on the programme structure, for which the village head said "no clear document has been found", weakened the village's ability to demand compliance from parties outside its formal structure. In line with O'Toole's (2000) view of multi-actor implementation and with the layered perspective of Hill and Hupe (2014), we suggest that the bureaucratic-structure dimension be read as the consistency of standards along the service chain, covering all organizations and workers who handle the object of the policy, not only the organization formally designated as implementer.

Policy Implications

Several implications follow for city and village governments. The city should ensure that the same separation standard applies at all TPS, whether managed by villages or by the agency, so that no laxer disposal route remains. Waste collectors should be treated as policy implementers, with training, partitioned carts or separate collection schedules for each waste type, and incentives tied to the success of separation. Organic processing facilities should be available at RW level before residents are asked to process their own organic waste. Villages should issue or revise a decree on the programme structure that sets out the roles of the village, RW, sanitation sections, and collectors, including arrangements for maintaining donated facilities. Sanctions such as holding back unseparated waste should be applied only once the later links are able to preserve separation, so that residents who already comply are not penalized. These steps would also strengthen the contribution of household separation to the city's wider sustainability goals, since waste that stays separated can be composted or recycled instead of adding to the pressure on Sarimukti.

CONCLUSION

Implementation of the Kang Pisman programme in the urban village studied was relatively strong on communication and on the disposition of village officials, but weak on resources at RW level and on bureaucratic structure. Repeated outreach and a strict rule at the village TPS were not enough to secure separation, because the separation chain broke outside the household: organic processing sites were missing, collectors remixed separated waste, and an RW could switch to an agency TPS that did not require separation. The main obstacles were a small budget that was at one point halted, low pay for collectors, uneven awareness combined with weak sanctions, and an informal programme structure. The village responded with CSR partnerships, maggot-cultivation income for collectors, close monitoring at the TPS, and active management by its staff.

We conclude that a source-separation policy is only as strong as its weakest link. The concept of a broken separation chain shifts attention from residents' awareness alone to the consistency of standards along the service chain, and it suggests a broader reading of the bureaucratic-structure dimension in Edwards III's model.

SUGGESTION FOR FUTURE RESEARCH

The study rests on four informants, with only one RW head and one resident from the same RW. The views of collectors, DLHK staff, other RW, and residents who do not separate were not gathered directly, although the findings on remixing and on the switch to the DLHK TPS depend heavily on their

perspectives. Future research should treat collectors as key informants and trace waste flows directly from households to the TPS, for example through observation along collection routes.

The estimate that about 70 percent of residents separate their waste is an informant's judgement, not a measurement. The obstacles concerning the halted budget and low pay were not accompanied by budget or wage data. Studies combining interviews with waste audits and financial records would make it possible to quantify where separated material is lost and what level of pay or incentive is needed to keep it separated. Comparative research across several urban villages, with and without TPS that enforce separation and with and without nearby agency sites, would test whether the exit mechanism observed here appears elsewhere and how a uniform city-wide rule changes it.

CO-AUTHOR CONTRIBUTION

The authors declare no conflict of interest in this article. All authors contributed to the conception and design of the study, the analysis and interpretation of the data, and the writing and revision of the manuscript, and all authors approved the final version.

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