

THE PATH OF TRANSITION

BANDUNG'S JOURNEY TOWARD A ZERO WASTE CITIES



Norwegian Retailers'
Environment Fund





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GLOSSARY

Buruan Sae	An integrated urban farming program promoted by the food and agriculture department of the city of Bandung
Camat	The leader of the district
DLHK (Dinas Lingkungan Hidup dan Kebersihan)	An integrated urban farming program promoted by the food and agriculture department of the city of Bandung
Kang Pisman	Bandung City Government program to reduce, reuse and recycle
Karang Taruna	Youth organization of Kelurahan
Kelurahan	An administrative areas below District, Regency/City, Province in Indonesia
KBS (Kawasan Bebas Sampah)	Zero Waste Area
Lurah	The leader of Kelurahan
PERDA (Peraturan Daerah)	Local Regulation
PP (Peraturan Pemerintah)	Government Regulation
PDK (Perusahaan Daerah Kebersihan)	A regional company that conducts business in the form of providing waste collection services, waste management, utilization, and cleaning services
PKK (Pemberdayaan kesejah teraan keluarga)	Family Welfare movement. Organization that empower women to participate in Indonesia's development
PIPPK (Program Inovasi Pembangunan dan Pemberdayaan Kewilayahan)	The financial budget for Regional Development, Regional Empowerment, and Empowerment Innovation Program. The program includes RW Scope empowerment activities, PKK scope empowerment, Karang Taruna scope empowerment
RTPS (Rencana Teknis Pengelolaan Sampah)	Solid Waste Management Technical Plan
RW (Rukun Warga)	Citizen Association. Community Institution working in the context of government and community services that are recognized and fostered by regional Government
Tempat Pembuangan Akhir (TPA)	A place used to dispose of waste that has reached the final stage in waste management and also known as a City Landfill.

AFTER THE PILOT PROJECT



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**“Kang Pisman”
program, which stands
for “Kurangi (Reduce),
Pisahkan (Separate),
Manfaatkan (Utilize)”**

Since YPBB organized the Bandung Forum for Championing Zero Waste (BJBS) with various partner organizations and the Bandung City Environment and Sanitation Service (DLHK) in 2013, the development of Zero Waste Cities (ZWC) based on segregation at source (households) have been experimented within several kelurahans, with Sukaluyu and Babakan Sari as the 2 pilot kelurahans. Currently, Sukaluyu has succeeded in managing a network of organic waste composting points at the community scale. Meanwhile, out of 3 RWs in Babakan Sari, 1 RW has consistently sorted waste from sources.

From those 2 pilot villages, we learned that the consistency of the sorting system implementation still relies heavily on some prominent figures in the local RW. By relying solely on individual figures, changes in solid waste management in the city of Bandung will take too much time, making it inefficient. For example, without a strong figure, 2 RWs in Babakan Sari deposit organic waste only to meet the requirements of the ZWC. The mechanism becomes problematic: instead of the household residents themselves, the garbage collectors sort the organic material from the residents' mixed waste. After all, these figures do not always serve or live in the region, so the sustainability of the system cannot depend on them forever.

From various lessons and experiences, the ZWC program continues to be developed, one of which is through the collaboration between YPBB and Mother Earth Foundation (MEF) Philippines. After Sukaluyu and Babakan Sari, YPBB tried to implement the KBS program in Sukamiskin, Cihaurgeulis, and Neglasari Villages. In 2018, BJBS also succeeded in encouraging the mayor of Bandung to launch the “Kang Pisman”. Under the “Kang Pisman” program, the Municipal Government of Bandung has prioritized 8 kelurahan to become KBS. As of 2018, the KBS program has been present in 41 RWs in Bandung.

Expanded Pilot Work Milestone

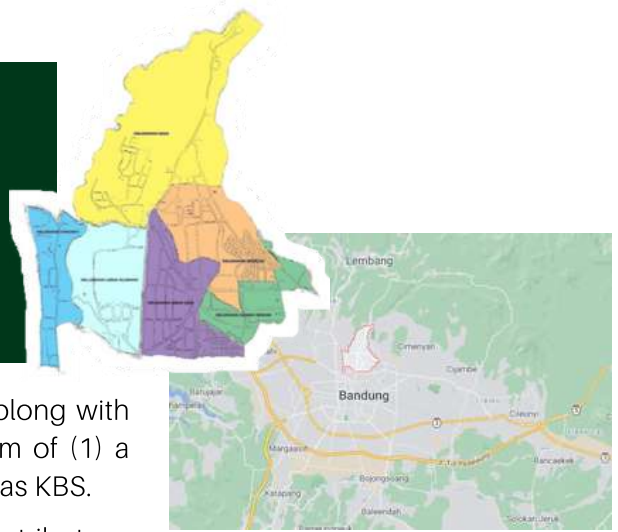


In addition to Kang Pisman, Bandung City Regional Regulation (PERDA) No. 9/2018, which stipulates the role of the city government in sorting, collecting, managing, transporting, and final waste processing, was also published. With YPBB assistance, this Perda was translated into a Regional Waste Management Technical Plan (RTPS) that involved local communities and garbage collectors.

However, the conditions and governance of solid waste management in Bandung City, particularly those related to the source sorting system, is not automatically all right. There are still many gaps to be fixed; from the aspects of planning, regulation, institutions to financing. The unclarity of responsibility holders for collecting sorted waste is still a problem because community institutions such as Kelurahan and RW do not have sufficient authority and resources to implement the system. Law enforcement strategy to implement Regional Regulation no. 9 of 2018 is still absent.

As a result, the implementation of sorted waste management at the regional level tends to depend on some prominent figures and the residents' compliance and on a very limited scale. Apart from public participation, waste management procedures, institutions, regulations, programs, and financing, particularly for collection and sorting, are crucial aspects. Without a holistic and structural involvement of the government, the governance of source-based sorted waste collection at the regional level would not function properly.

The Development of Zero Waste Area (KBS) in Coblong District

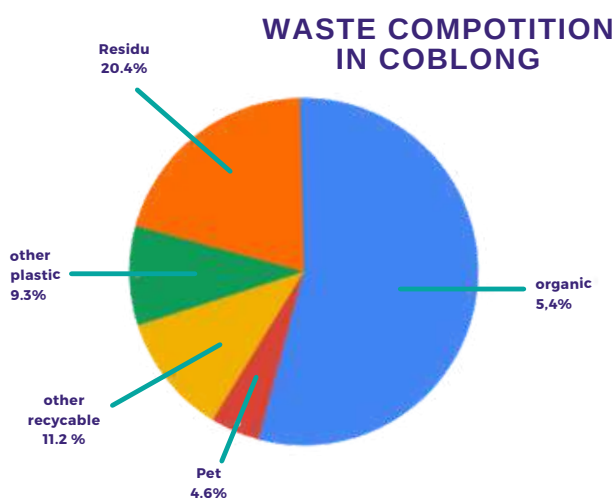


In 2019, YPBB began assisting the development of KBS in Coblong with funding from USAID-MWRP. Support from DLHK was in the form of (1) a partnership letter with YPBB and (2) the appointment of Coblong as KBS.

In the center of North Bandung, in a valley of Citarum river tributary, Coblong stretches from the upstream to the middle of Cikapundung river bank. This sub-district has grown into a densely populated area with the fourth largest population in Bandung. Many settlements were built along the steep riverbanks.

Coblong develops into a tourist and business area with various business buildings, restaurants and hotels. The district location is so close to the Bandung Institute of Technology (ITB) that many people build student boarding houses. As a result, residential areas grew out of control. With a population of 133,000 people, around 78 tonnes of waste are generated every day. This amount does not include the waste from boarding houses where the students are often unregistered as residents.

SUMMARY				
Total Population (2014)	131,435.00			
total waste generation (from household)	30.65 ton per day	78.861 tpd		
waste generation per capita per day	0.23 kg/ capita/ day	0.6		
Percent of uncollected waste (predicted)	45.11%			
total collected waste	6,141.46 ton/ year	16.83 Tpd		
total uncollected waste	5,046.38 ton/ year			
Collected Plastic Waste (high value plastic - captured by waste bank or sold by waste collectors)	117.07 ton/ year			
Uncollected Plastic Waste (high value and low value plastic - to landfill or uncaptured)	1,430.00 ton/ year			



Waste Treatment	
Landfilled	6,044.41 ton/ year
waste banks	69.05 ton/ year
burnt in open air	287.03 ton/ year
Thrown into the river	175.48 ton/ year
Wholesale collectors	97.05 ton/ year
Composted	0.00 ton/ year
Dumped in the environment (in the forms of illegal dumpsites, etc)	4,514.82 ton/ year
timbulan total	30.65 ton/ day
Estimated plastic waste thrown into the river	16.24 ton/ year
Estimated burnt plastic waste	26.56 ton/ year
Estimated dumped plastic waste	417.75 ton/ year
Estimated landfilled plastic waste	559.27 ton/ year
total	902.74

Through our initial surveys, YPBB found that Coblong has not had a good and holistic waste management system yet. 5 RWs don't even have a waste collection system at all. Currently, there are only 6 Temporary Disposal Sites (TPS) (2 mobile) with a total capacity of 43 tons per day. Thus, there is about 45 percent or 35 tonnes of waste not accommodated by the local collection system, including $\pm$ 3.9 tonnes of plastic waste per day. This unmanaged waste ends up being piled up carelessly, burned, or littered into the river - so that it ends up polluting the sea. Jambeck et al. (2015) found that 80% of plastic waste in the oceans comes from leaks from this kind of inland waste mismanagement.



Source : YPBB ZW Clties Bandung Team

Together with the community members, YPBB began to map the conditions of their regional solid waste management as a basis for preparing a Waste Management Technical Plan (RTPS).

The process of community approach and socialization took a relatively longer and slower pace. There are many cases where the Kelurahan and RW officials are not very interested in the issues of waste management. Meanwhile, several RWs concerned with

the issue are often constrained by the slow coordination with the "independent" waste collectors. We fully rely on the community's expressed willingness to accept proposals for a sorting system, along with its connection with Bandung city programs, such as Kang Pisman, Buruan Sae (localized urban farming), and Citarum Harum (Citarum river cleanliness).

With all limitations, we continue to accompany PKK cadres, Karang Taruna, and other RW units who are willing to carry out

the ZWC stages. The program set-up at Coblong also partially depends on the personal relationships between YPBB field staff and the waste collectors. The lack of coordination between the YPBB team, RW, and waste collectors sometimes led to the cancellation of the ZWC program in the middle, propelling us to leave the particular RWs and start over in other new RWs.

So far, the percentage of household compliance to sort waste is around 30 percent.

KELURAHAN KANG PISMAN - KBS MODEL PROJECTS IN SUKAMISKIN, CIHAURGEULIS, AND NEGLASARI



In Sukamiskin, Cihaurgeulis, and Neglasari, several residential areas are also on the riverbanks. In mid-2019, the City Government of Bandung prepared a kelurahan-scale Waste Management Technical Plan (RTPS) in 8 kelurahans, of which 8 RWs became the first model for the KBS program. In early 2019, the development of this RTPS was followed up by the application and expansion of the RW KBS model to a kelurahan scale, which was later referred to as Kelurahan Kang Pisman.

In contrast to Coblong, the City Government is involved in the implementation of Kelurahan Kang Pisman model development in each kelurahan. DLHK launched 2 kelurahans with Kang Pisman model, namely Sukamiskin and Cihaurgeulis. Meanwhile, Kelurahan Neglasari has also adopted the Kang Pisman Kelurahan model approach through government initiatives at the kelurahan level.

Approaching residents has been relatively quicker when the government participates and

deploys personnels in the field. In Sukamiskin and allocates humanresources as operational managers and provides infrastructure support. The RTPS has also been issued as a reference in accordance with the conditions of each kelurahan. In Neglasari, the kelurahan government appointed several kelurahan officials as “Kang Pisman officers” to carry out supervisory work.

Interestingly, in 2019 to 2020 the level of adherence to household waste sorting in areas with active government support was not much different from Coblong (without active government support), which was 34 percent. This figure is below the DLHK target which stipulates a minimum of 50 percent of compliance level for sorting by the end of 2020, as well as 75 percent of compliance and 75 percent of processed organic waste in the region in the first quarter of 2021.

The similarity in compliance levels leads us to ask: to what extent can government

involvement make a difference in solid waste management at the regional level? What are the key factors determining the success of the KBS model? What can we learn from comparing these 2 cases in our path to Zero Waste Cities, including reducing the leakage of plastic waste into the ocean?

In this paper, YPBB seeks to emphasize the importance of a holistic involvement of the city government in waste management at the regional level, particularly in (1) building institutions and (2) sustainably financing a system for a sorted collection system. We will review, compare, and analyze the KBS development projects in Coblong and 3 model areas in Sukamiskin, Cihaurgeulis, and Neglasari to explain why these two things should be prioritized.

OUR WORK



Source : YPBB ZW Clties Bandung Team

At the end of 2016, YPBB began to develop the Zero Waste Cities (ZWC) program as a more sustainable and environmentally friendly alternative to the collect-transport-waste system that is still widely used.

Implementation of Holistic and Decentralized Solid Waste Management

Through a holistic and decentralized approach, we consider the interconnectedness of multiple aspects, scales and stages in order to continuously improve solid waste management. So far, ZWC has focused on developing and replicating regional models that implement a system of source-based sorting, disaggregated collection, and processing as close to source as possible. Model and governance development are interrelated because without changes to solid waste governance, model performance in the field tends to be inefficient, difficult to predict, and hard to replicate. Without good model performance, the impetus for governance change will be difficult to emerge. Therefore, both need to be optimized simultaneously.

With a holistic approach, the lack of public awareness (which is often seen as the main cause of solid waste disasters) is not the main problem, but only one of the consequences of poor solid waste governance.

We identified 5 interrelated aspects that need to be continuously addressed for a holistic and decentralized regional waste management, namely (1) institutional, (2) operational, (3) financing, (4) regulatory, and (5) public participation.

Institutions are related to the division of authority and responsibility, coordination mechanisms, and forms of waste management organization. Meanwhile, operational aspects relate to program implementation, facilities and infrastructure. Regulatory aspects concern legal provisions, including the supervision and sanction mechanisms. Financing system determines the amount of costs allocated. Finally, public participation is related to educational efforts to increase community engagement in waste management, i.e. the obligations of households as regional waste producers. These five aspects are discussed and formulated in the Waste Management Technical Plan (RTPS) for each region.

Amidst an economic system that continuously produces various kinds of waste, the linear logic in waste management is not only centralized and capital intensive, but also dangerous for humans and the environment. Heaps of mixed waste that are transported kilometers from the source (with high transportation costs) end up being dumped in a Final Disposal Site (TPA) or burned in incinerators. Meanwhile, mixed waste that is not transported is dumped, piled up, and burned carelessly in the environment around human settlements, including rivers that will carry them into the sea. All of this produces liquid waste, gases and toxic fumes.

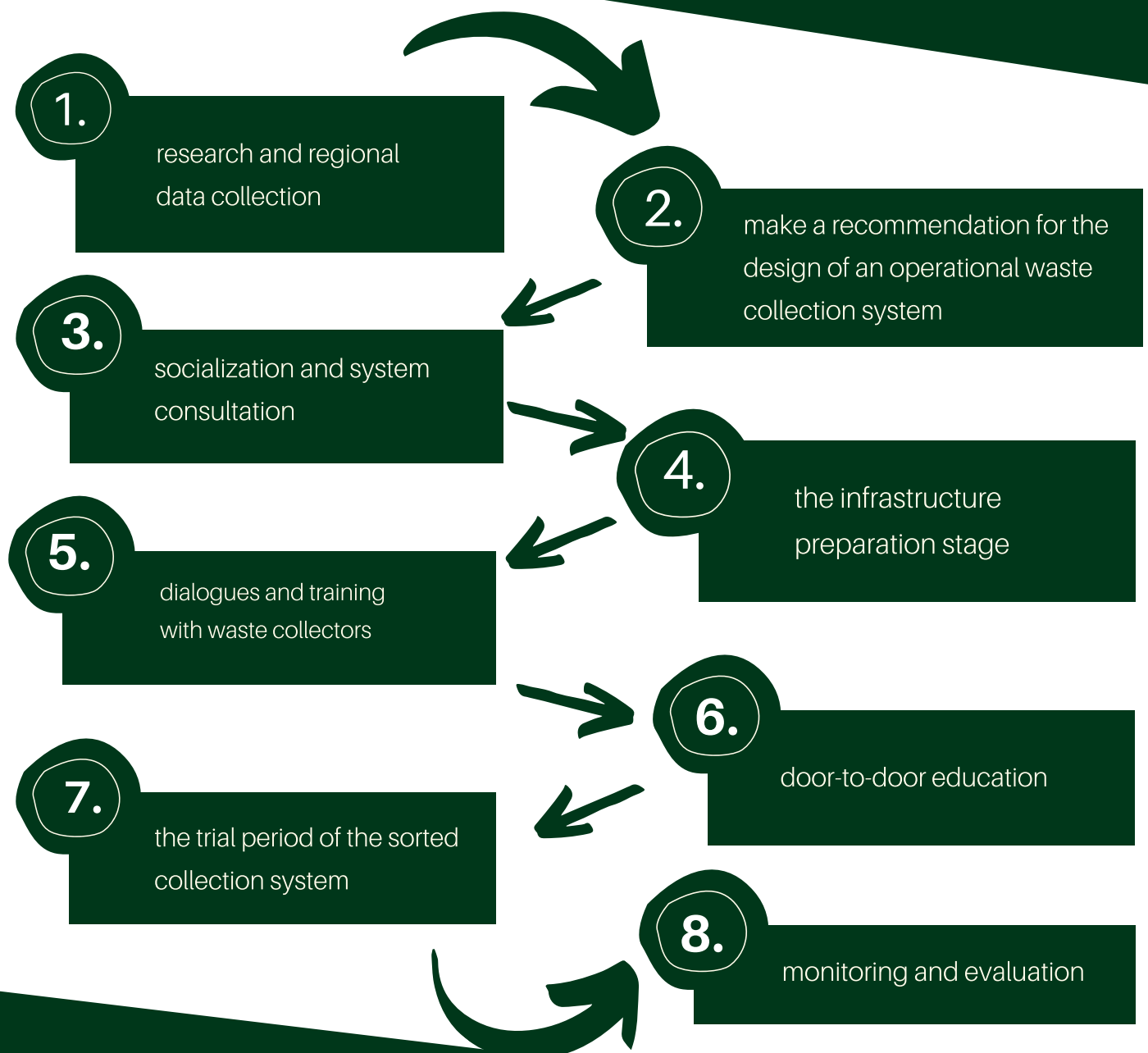
ZWC offers a circular, holistic and decentralized solid waste management. Beyond the technical issues of reducing and recycling waste, ZWC aims to build a common paradigm of community participation for a more sustainable and environmentally sound life. ZWC strives to build a management system that is participatory, capable of creating environmentally friendly jobs, and encourages the identification and reduction of waste. The mainstreaming of ZWC in Indonesia is assumed to increase material recovery and reuse in a circular manner, manage all waste in the area to reduce the amount of waste that must be transported to the landfill, and encourage more just and sustainable governance policies.



Source : YPBB ZW Clties Bandung Team

STRATEGY

To develop a sorted collection system and holistic waste management, we implement 4 main strategies, namely (1) behavior change—through socialization and door-to-door education (DTD-E), (2) sorted waste collection—through designing a decentralized system and waste management infrastructure (especially organic), (3) involving waste collectors—through training, living wages provision, and ensuring occupational health and safety (HSE), and (4) support for local governments—through the Kang Pisman program, SUP policy, and other collaborative programs.



COBLONG DISTRICT

Through our project with MWRP, YPBB seeks to implement the ZWC model in 6 Kelurahan in Coblong District, with a target population of 5,625 households. Coblong was chosen because of its close location with the Citarum tributary—which was recently classified as the dirtiest river in Indonesia and one of the main sources of plastic waste pollution in the ocean. If the ZWC model is applied, the disposal of plastic waste into rivers can be reduced. Material recycling in the area will also be better treated.

After conducting an overall survey, we started contacting Kelurahan and RW officials in Coblong to offer the ZWC program. Out of 94 RWs, 15.96 percent (or 15 RWs with a population of 4,119 HHs) have run ZWC. We continuously implement the strategy and stages of ZWC development together with local community leaders and cadres.

In Sekeloa Sub-district, for example, the waste collectors say they are helped by the household sorting. Organic waste they collect is processed in compost pits and biodigesters, or distributed to Karang Taruna and PKK groups who make fertilizer. After seeing the positive impacts of the ZWC program, several kelurahans are willing to allocate the RW budget for (1) training and incentives for waste collectors and (2) building infrastructure for processing organic waste. The enthusiasm of the residents to process compost is also related to the urban farming program "Buruan Sae" held by the city's Food and Agriculture Office.

The compliance level of residents to the ZWC system in Coblong after 2 years of the MWRP project is 34.43 percent. Meanwhile, the amount of waste diverted or not transported to the TPA is 25.01 percent. However, these figures are still volatile. According to YPBB field staff in Coblong, the compliance level in this area is influenced by at least 3 factors: (1) consistent door-to-door education, (2) support from waste collectors, and (3) support from the RW. Moreover, the ZWC program in Coblong is still in the early stages of model development.

However, the manual education and coordination process takes a lot of time, energy, and human resources, especially if the ZWC model is to be implemented on a city scale. Thus, to achieve a national target of 30 percent waste diversion, we recommend a regulation-oriented approach and focus on efforts to monitor, enforce rules, and reform regional waste management and governance.



With this rationale, DLHK provides an additional incentive of Rp 1,250,000,- directly to the RW waste collectors in Sukamiskin and Cihaurgeulis to collect waste in a sorted manner. Although helpful in the community approach and introduction of the system, this incentive has not been successful in systematically changing the overall work pattern of collectors. Some RWs still haven't done the sorting and some collectors refuse to transport organic waste. In some RWs, waste collectors are willing to sort mixed waste from residents who don't comply because the unsorted waste will have a negative impact on the collectors' assessment points later. There is also a case in Sukamiskin where collectors who do not receive incentives are still willing to carry out sorted collections properly.

In Neglasari, the amount of waste generated is 2.4 tons per day. The amount of waste to be potentially reduced is 71.60% of food waste and recyclables, or around 1.46 tons of waste per day. The kelurahan government appoints and provides incentives to ... kelurahan officials as "Kang Pisman officers" to monitor sorted collection by residents and waste collectors in the area.

Of the 8 RWs in the Kelurahan, a house-to-house organic waste collection system has been implemented in 6 RWs (RW 03-08). RW 01 uses an organic waste collection point system. This means that the Kang Pisman officers appointed by the Kelurahan monitor the sorting by the collectors and go door to door to pick up the waste from households that have already sorted, but from whom the waste collectors refuse to transport organic waste. Meanwhile in RW 02, half of the waste is collected from house to house. The other half is using organic collection points. The frequency of collection is 3 times a week, following the schedule of Organic Waste Transportation Services to the municipal Organic Processing Center Facilities (POO) by PDK. Increased compliance occurs along with our continuous education. The Kelurahan government integrates Kang Pisman with their social aid program: beneficiaries are required to sort waste. If a beneficiary does not, the Kelurahan officials will reprimand them. In social aid events, the ZWC program is also socialized, so that residents are constantly reminded to sort waste at home.



Source : YPBB ZW Clities Bandung Team

3 KELURAHANS MODEL

In general, the collection of sorted waste has been carried out routinely in the 3 model kelurahan through two systems: (1) house to house and (2) organic waste collection points. In Cihaurgeulis and Sukamiskin, DLHK provides incentives to waste collectors and sends several personnels to the area. Meanwhile in Neglasari, the kelurahan government appointed "Kang Pisman Officers" to supervise sorting activities. These two different interventions produce different dynamics. The chosen model kelurahans represent diverse socio-economic profiles--which also affects the program performance. Sukamiskin is an upper-middle housing complex and produces 4.7 tons of waste per day. The potential waste reduction is 68.92% of food waste and recyclables or about 3.2 tons of waste per day. Organic waste collection is carried out every day in each RW. Cihaurgeulis is a lower-middle class dense settlement consisting of 12 RWs and produces 2.7 tons of waste per day. The potential amount of waste that can be reduced is 71.60% or equivalent to 1.93 tons of waste per day. All RWs in this sub-district have been sorting waste using an organic collection system from house to house with a collection frequency ranging from 2-3 times per week. Waste

collectors coordinate with the DLHK team in the field so that the sorted collection runs smoothly. The kelurahan staffs are also more responsive with DLHK's presence, even when the head of Cihaurgeulis is in the process of retiring. With direct coordination between DLHK and each kelurahan, the implementation runs faster and smoother, especially in Cihaurgeulis and Sukamiskin sub-districts. The promise of additional incentives from the city government to waste collectors is also a significant pull factor--however tricky. The YPBB team was also helped by the involvement of DLHK in the door-to-door education. On the other hand, the ZWC program developed by YPBB provides direction and guidance for the implementation of DLHK's KBS program so that Kelurahan Kang Pisman in Sukamiskin and Cihaurgeulis can be good and relevant examples. In Cihaurgeulis and Sukamiskin, the city government provides incentives to several local waste collectors. The initiative was motivated by the low income of waste collectors (for example, we met many collectors who were paid Rp. 300,000 - 400,000 per month), whereas from the previous experience of implementing KBS, waste collectors have an important role in sorted collection. Hence, the government

assumes that the minimum salary from the RWs hinders the implementation and operation of the system. Moreover, the new system requires collectors to do additional work and adapt their work to systemic changes. As a result, 12 of the 15 RWs that we assisted had done the sorting. Due to the pandemic protocols that limit the inflow of outsiders, we were unable to collect data from the other 3 RWs. We also transferred the responsibility for the educational process to the RWs. In this kelurahan, the YPBB team is supported by 3 DLHK teams--the KBS Assistance Team (PKBS), the Waste Processing Team (OS), and the Waste Transporter Team (PES)--to assist in the door-to-door education process and compost organic waste surplus that cannot be processed in the area. With a lot of vacant land in Sukamiskin, the park caretaker paid by the local RW also installed an organic chopping machine, overlay bricks, and a composting facility with maggots to process organic waste. To facilitate the program coordination, Sukamiskin residents created a WhatsApp group. The processes of approaching and coordinating with the RW is fully supported by the Lurah, also because of the involvement of the DLHK.



CHALLENGES

The cases that we described in the previous chapters show that an environmentally friendly sorted waste collection system at the regional level is possible with the ZWC framework. Existing models need to be continuously improved, replicated, and accelerated in their deployment as the urgency of the environmental and social crisis intensifies. So far, these efforts have encountered various challenges from the 5 dimensions of regional solid waste management and governance, ranging from regulations, institutions, operations, financing, and public participation. However, as we emphasized earlier, governance improvement cannot be done partially and separately. Improvement must address all aspects holistically because challenges in one aspect are interrelated to constraints in other aspects. In terms of regulations, the government actually has the means to improve waste governance and encourage sorting. Regional regulations on waste management have been updated and regulate various aspects, including sorted waste management. This update is aligned with PP 81/2012 (PERDA 9/2018). In parallel, several Mayoral Regulations derived from PERDA 9/2018 are in the finalization stage, for example to regulate the preparation and formalization of the City-level Waste Master Plan (RIS). Accelerating the processes of updating and implementing existing regulations requires consistent assistance and supervision at every stage.

The city government's difficulty in implementing this regulation is related to institutional issues. Although the institutional directions on decentralized waste management at the regional level have been stated in the latest PERDA, the institutions and division of roles at the regional level are still unstructured. So far, Kelurahan and RWs do not have the official authority and adequate human resources to manage waste. As a consequence, supervision and enforcement of rules have not run optimally. There are no consequences or sanctions if there are violations. Collectors and the YPBB team can only admonish and remind, while still transporting household waste that is not sorted. Therefore, the YPBB team continues to encourage the regional governments to issue regulations that oblige residents to sort out.

From an operational perspective, the challenges are related to the difficult coordination with "independent" waste collectors and Kelurahan government officials. In Coblong, most of the collectors are "independent", hence not managed by the RW. Several Lurahs did not fully support the initial implementation of the system, so YPBB field staff often experienced coordination deadlock. In Cihaurgeulis, some RW chiefs are too busy with other work--including housework responsibilities for those who are also housewives. Sometimes, waste collectors who have been given incentives do not carry out educational tasks nor follow the schedule.



Source: YPBB ZW Clties Bandung Team



In Neglasari, coordination between Kang Pisman officers with kelurahan officials and YPBB team is running slowly. Kang Pisman officers still feel reluctant to reprimand residents who do not comply. Their monitoring and evaluation work is not carried out according to the agreed schedule. Consequently, the target fulfilment is delayed. These constraints indicate that incentives alone (without strong institutions) will not be sufficient to improve regional waste management.

In terms of financing, the sorted waste management system has not yet received an official budget from the city government, though we have repeatedly explained that a holistic waste management system requires the city government to officially pay the waste collectors.

For now, DLHK has only been able to provide incentives to some (not all) waste collectors in Sukamiskin and Cihaurgeulis, apart from the salaries they already received from the RWs or residents. Meanwhile, several RW figures in Coblong proposed to allocate PIPPK funds for incentives for waste collectors. However, the lurah and camat forums objected because PIPPK were usually used for infrastructure or public facilities. With the COVID-19, this already-limited fund must also be budgeted for handling the pandemic crises. Many "independent" waste collectors are paid directly by the residents, not through the RWs. Several RWs admitted that they did not want to organize the payment of waste collectors because they did not want to be blamed for (if any) miscalculation of the retribution.



Source : YPBB ZW Clties Bandung Team

In terms of physical infrastructure, the main obstacle is not the budget but the in/availability of space, particularly in densely populated residential areas. To overcome this, YPBB recommends the use of small-scale infrastructure such as small composters and modular containers, the provision of which is assisted by DLHK Bandung.

In short, a new financing strategy and a structured retribution system are needed by the government to cover the costs that have been incurred by the community to pay for the local waste collectors' services.

Amidst regional waste management that is still in the early stages of transition and institutional building, public participation--the role of cadres, regional officials, and community leaders who are environmentally conscious and willing to actively participate in the ZWC program--plays an important role. However, as stated earlier, relying solely on figures (including field facilitators) is not enough. These figures and field facilitators do not always serve or live in the area so that the sustainability of the system cannot forever depend on them. In addition, the system needs to be designed in such a way that every citizen can become an active participant according to their respective roles, interests, and skills in improving regional waste management and governance.

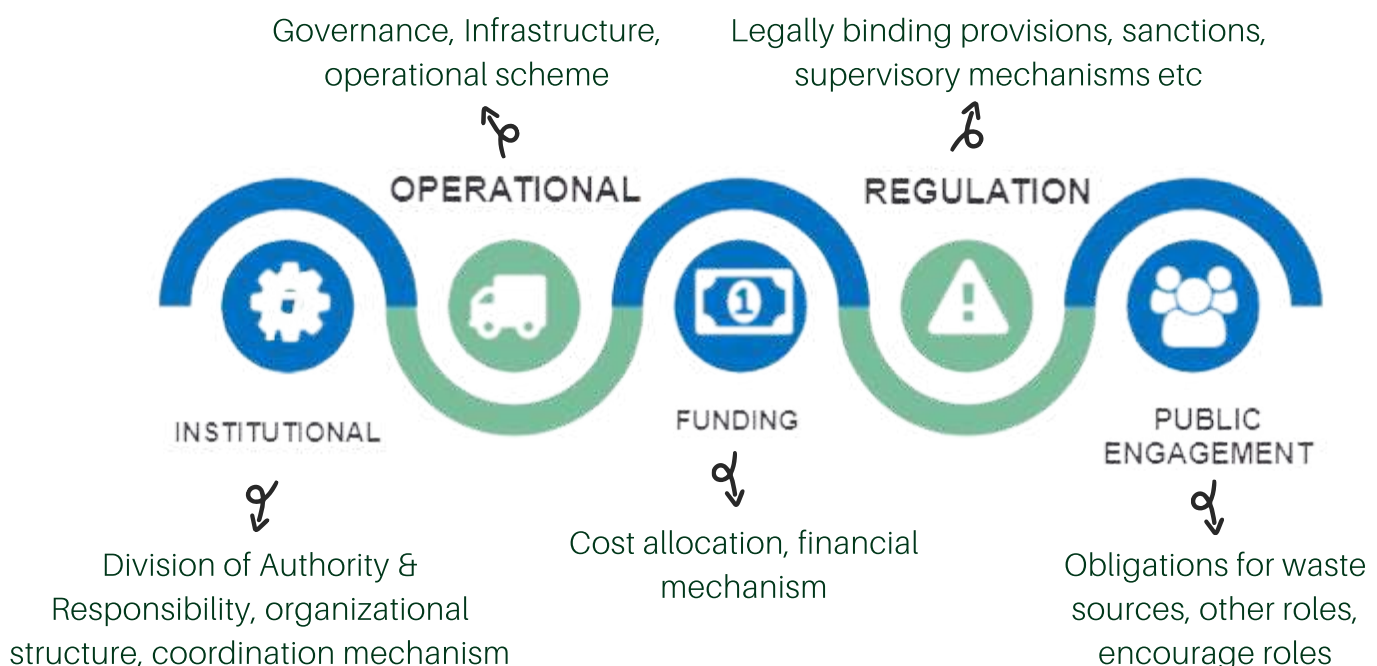
CONCLUSION

Threading the road to Zero Waste Cities is not an easy process. The comparison and analysis of the cases in this paper show that holistic sorted waste management at regional level using the ZWC model is possible.

However, implementation, replication, and expansion to a city scale requires overall governance improvements. Partial government intervention proved inefficient and wasteful of resources. Providing incentives alone in model kelurahans without structured institutional building has proven to produce a level of compliance similar to areas that do not receive incentives, nor does it change the overall sorted collection and management system. The process of door-to-door education and manual coordination requires too much resource and energy. These two interventions, if carried out separately from other aspects of improvement, also create dependence on the community for incentives, figures, and assistants.

Therefore, YPBB continues to recommend the government to immediately develop a model with a holistic ZWC governance. Establishing sustainable financing and institutions for a source-based sorted waste collection system should be a priority; starting from strengthening regulations and institutions from the city to kelurahan level, transferring payment responsibility for waste collectors to the government, granting kelurahan authority for sorted collection, as well as implementing regional sorting rules--including monitoring and sanction mechanisms.

Waste Management Governance





**THE PATHS OF TRANSITION:
BANDUNG'S JOURNEY TOWARD A ZERO
WASTE CITY**

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