STUDY OF

SOLID WASTE MANAGEMENT FINANCING IN INDONESIA

FINAL REPORT

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Table of Contents

Abbreviations and Acronyms

APBD = Local Government Budget (City or Provincial Government)

APBK = City Government (Aceh) Budget

APBN = State or National Budget

Bappenas = Ministry of National Development Planning

BLUD = Regional Government Public Service Agency

BNI = Indonesian state-owned Bank

BPK = Supreme Audit Institution of Indonesia

CAPEX = Capital Expenditure

CBO = Community-Based Organization

CPIU = Central Project Implementation Unit

CPMU = Central Project Management Unit

DAK = Specific Allocation Fund

Dana Desa = Village Fund

Dana Otsus = Special Autonomy Fund

DAU = General Allocation Fund

DEPA = Danish Environmental Protection Agency

DID = Local Incentive Fund

DLH = Local Environmental Agency (Dinas Lingkungan Hidup)

DIPA K/L = Line Ministry Budget Documeny or Budget Execution (Allotment) Document

DPA SKPD = Budget implementation document of local government working unit

DPKAD = Regional Finance and Asset Management Agency

EA = Environmental Agency

EPR = Extended Producer Responsibilities

ERiC = Emission Reduction in Cities program

FY = Fiscal Year

GIZ = German Cooperation for International Development

GNI = Gross National Income

GR = Government Regulation

ISWA = International Solid Waste Association

Jakstranas = National Waste Management Policy and Strategy

KEM PPKF = Macroeconomic Framework and Fiscal Policies Principles

KfW = Kreditanstalt für Wiederaufbau (German Financial Development Cooperation)

KLHK = Kementerian Lingkungan Hidup dan Kehutanan (Ministry of Environment & Forestry)

KPPN = State Treasury Office

KUA = General Local Budget Policy

LG = Local Government (City or Provincial Government)

LKPP = National Public Procurement Agency

MoF = Ministry of Finance

MoPWH = Ministry of Public Work and Housing

NGO = Non-Governmental Organization

OECD = Organisation for Economic Co-operation and Development

OPEX = Operational Expenditure

PAD = Local Own-Source Revenue

PDAM = Regional Water Supply Utility

PDU = Recycling Centre (Pusat Daur Ulang)

Permen = Ministerial Regulation

Perpres = Presidential Regulation

PIU = Project Implementing Unit

PMK = Ministerial (Ministry of Finance) Regulation

PPAS = Local tentative Budget Ceilings and Priorities

Qanun = Local Regulation (Aceh)

RAPBD = Local Government Budget Plan

RAPBN = State Budget Plan

Renja K/L = Annual Work Plan of Ministerial/Agencies

Renja SKPD = Annual Work Plan of Local Government Working Unit

Renstra K/L = The 5-year strategic plan of Ministerial/Agencies

Renstra SKPD = The 5-year strategic plan of Local Government Working Unit

RKA K/L = Annual Work and Budget Plan of Ministerial/Agencies

RKA SKPD = Annual Work and Budget Plan of Local Government Working Unit

RKP = Government Annual Work Plan

RKPD = Local Government Annual Work Plan

RKUD = Regional Public Cash Account

RPJMD = Local Government Medium-Term Development Plan

RPJMN = National Medium-Term Development Plan

RPJPN = Long-Term National Government Development Plan

RT/RW = Rukun Tetangga/Rukun Warga (neighborhood associations)

SECO = Switzerland State Secretariat for Economic Affairs

SIPSN = National Waste Management Information System (Sistem Informasi Pengelolaan Sampah Nasional)

SKPD = local government working unit

SKRD = Regional Retribution Ticket/Coupon

SNI = National (Indonesian) Standard

SPM = Payment orders

SP2D = Remittance orders

SSC = Strategic Sector Cooperation

SWM = Solid Waste Management

TAPD = Local Government Budget Team

TPS = Temporary Collection Point

TPS3R = Waste Treatment Facility, 3R concept

TPST = Integrated Treatment Facility

UNDP = United Nations Development Programme

UN ESCAP = United Nations Economic and Social Commission for Asia and the Pacific

EXECUTIVE SUMMARY

In 2001, the decentralization of authorities in Indonesia commenced. Since then, many administrative responsibilities of the central governments, including that of waste management, have been transferred to the sub-national level (provinces, cities, and districts). Among these responsibilities, the primary responsibility for delivering solid waste management services has been passed over to the local governments (sub-nationals). As stated in the Regional Government Act 23/2014, waste management has been classified as concurrent government affairs and has been categorized as a mandatory sector of government responsibility with shared responsibilities among the three levels of government.

As regards generation of waste, the rapid urbanization all over Indonesia is directly affecting the total waste generation rates. This has however not yet been accompanied with the necessary levels of sustainable waste management services, particularly in terms of institutional, technical and financial measures. The poor state of the current sector performance, as stated in the National Medium-Term Development Plan (RPJMN) 2020-2024, still contributes significantly to the leakage of waste to the environment, with a total waste handling rate of merely 67% natonally, and a waste reduction rate of as little as 2.3%. Based on data from the Indonesian Ministry of Environment and Forestry (KLHK) from 2016, approximately 45% of the final disposal of waste was done by open dumping.

The current practice of waste management in most cities across the country consists of basic collection, transfer and disposal, with low-scale recycling initiatives such as waste treatment facilities, 3R concept (TPS3R), waste banks, and the like. Furthermore, the World Bank estimates that the budget allocated for waste management services in most metropolitan and big cities across Indonesia only reach 2.5% of the total municipal budget, which equals 5 - 6 USD per capita. This is well below the level of budget spent on waste management in many other lower-middle-income countries.

The most widely practiced model of waste management in Indonesia mainly comprises of two parts: 1) Primary collection organized by community with user fees; 2) Secondary collection to final disposal activities organized by the municipality financed by municipal budget allocations. In some cases, primary collection might, however, also be done door-to-door organized directly by the municipality. Due to the variety of operational models practiced, even between neighborhoods in the same city, the waste collection frequency and mechanism as well as the payment structures also varies widely across cities in Indonesia. In general, the most commonly practiced service delivery model is the public model, where the municipality serves as both client and operator. According to the International Solid Waste Association (ISWA 2015), this model, which usually runs as a cost center, would typically work well as long as a sufficient budget is allocated by the municipality to sustain the service. Such model is however vulnerable to political factors and economic challenges. In the Indonesian context, the problem with such

model is thus that the allocated budgets are typically far below minimum levels required to sustain basic services.

The sources of financing for the waste sector comes from the State Budget (APBN) and the Local Government Budget (APBD). The provincial and city government (APBD Provinsi and APBD Kabupaten/Kota) thus depend on the types of activities financed, and which level of government that is responsible for the activities. Subsequently, APBN is not only used to finance the central government spending at the central level, particularly the ministries/agencies, but also to finance central government spending at the regions through the ministries (Vertical Funds) as well as Deconcentrated and Co-administered Funds. From the ration of the APBN, there is also a budget earmarked for fiscal transfers to the local government (transfers from APBN to APBD). All these APBN funds are usually allocated to finance capital expenditures.

Recently, one of the fiscal transfer funds from APBN to APBD has also been earmarked to provide operational funds as incentives for 12 cities implementing the waste-to-energy facility (incineration plant) in connection with the Ministerial Regulation (MoEF) 24/2019. Fiscal transfer funds include 1) Specific Allocation Fund (DAK); 2) Local Incentive Fund (DID); 3) Special Autonomy Fund (Dana Otsus); and 4) Village Fund (Dana Desa). In the waste sector, APBD is mobilized to finance the operational expenditure of waste management services. On the revenue side of APBD, there are two sources of financing associated with waste management: 1) Regional own-source revenues, which are mostly coming from waste retribution; and 2) Fiscal transfers. Apart from support in financing the waste sector, development partners and private sector companies also provide support to this sector, mainly in the form of capital expenditures and technical assistance.

The planning and budgeting of these funds are following the government budgeting system, which is prepared based on budget ceilings as well as priorities according to the annual government plan and required Parliament's final approval. The funds originating from APBN are included in the line ministry budget (DIPA K/L), while the funds originating from APBD are included in the budget implementation document of the related local government working unit (DPA SKPD).

As part of the Organic Waste Treatment and Handling track in the Strategic Sector Cooperation (SSC) between Indonesia and Denmark, five municipalities have been selected for further support to strengthen existing waste management systems and plan and implement new organic waste treatment projects. The cities are 1) Malang Regency; 2) Depok City; 3) Banda Aceh City; 4) Bukittinggi City; 5) Jambi City. It should be noted that the data available for Depok City only represents the budget of the Environmental Agency, which is not specifically representing the waste management budget. For the remaining four cities with a coverage of service areas ranging from 60% to 100%, the percentage budgeted for waste management from the total municipal budget varies considerably as follows: Malang Regency 0.3%, Banda Aceh City 2.18%, Bukittinggi City 0.61%, Jambi City 1.31%.

Furthermore, according to the historical data for the past few years, the waste management budgets in Malang Regency and Banda Aceh City have slightly

increased, while in Jambi and Bukittingi the trends are still fluctuating. The waste budget allocated in these cities range below the average waste budget allocation compared to other lower-middle-income countries (3% to 10% according to Wilson et al., 2012). Furthermore, it does not even reach half of the required budget to provide adequate services, as this figure is 5% or more, as suggested by the World Bank. In terms of revenue, only a small fraction of the costs are recovered through waste collection fees charged, ranging from 5.3% to 47.8% in the five cities assessed. In order to cover all waste management expenses incurred by municipalities, there is cross subsidization from other budgetary lines.

In conclusion, the current practice and arrangement of waste management services in Indonesia, which are mainly based on a public model combined with community-based participation, are still inadequate to provide basic required services and to minimize the leakage of waste to the environment and the sea. When it comes to financing, two issues need to be addressed in particular, namely i) availability of funding, both operational and capital, to finance the sector and its services; and ii) the effectiveness of the fund utilisation for different types of services.

Currently, efforts for improvement in the waste sector are underway, which among others include: i) restructuring of the waste retribution tariff based on a guideline associated with the standard cost of the full system that could be a strong legal basis when proposing the budget; ii) alternatives for institutional reforms with greater flexibility in terms of financial management as well as output-orientation (rather than today's input-oriented approach), with the involvement of for example a public service agency such as the Regional Government Public Service Agency (BLUD) in order to strengthen institutions and to ensure financial sustainability.

Further improvement would also be needed in terms of i) Retribution tariff adjustment, as mandated in the Act 28/2009, including improvement of the correlation between cost levels and revenue to reach full cost recovery and to improve the effectiveness of the collection systems; 2) Building greater capacity in all related aspects of the waste sector at each level of government according to their respective responsibilities. For strengthening the waste sector financing, building capacity will also be required as part of governance capacity building, including improved local government accountability of allocated funds.

Support to improving the financing system and fund allocation for the waste sector should also be combined with support for other influencing aspects in order to ensure sustainability of the waste management system and its services, in general. Therefore, collaborative efforts to improve the waste sector is needed, which would also require closer coordination with the national platform of solid waste management to achieve the best outcomes.

1. Introduction

1.1 Context

Denmark and Indonesia are engaged in a bilateral partnership on Solid Waste Management and Circular Economy. The overall objective of the cooperation is to foster a green and sustainable economy with sound environmental management and explore valuable resources through a Circular Economy approach hereby reducing negative environmental impacts to livelihoods, economy, and health. Part of this is sought achieved by cooperation between the Indonesian Ministry of Environment and Forestry (KLHK) (Directorate General Solid Waste, Waste, and Hazardous Substances Management) and the Danish Ministry of Environment and Food (Danish Environmental Protection Agency (DEPA)). The partnership is named the Strategic Sector Cooperation (SSC) and aims to raise capacity to implement the Indonesian National Policies and Strategies on Solid Waste Management (Jakstranas) and by developing links and framework for the private sector to invest in the Indonesian green sector. This cooperation is undertaken by exchanging knowledge, improving sector performance as well as creating better framework conditions for sector development and private sector involvement.

As part of the SSC, four topics have been agreed upon including Organic Waste Treatment and Handling, Waste Banks and Recycling Facilities, Extended Producer Responsibilities (EPR) and Plastics, and Improvement of Knowledge Management through better collection and management of waste data. With regards to Organic Waste Treatment and Handling, KLHK and DEPA have agreed to extend the cooperation and include a few selected cities in Indonesia for improving local organic waste services and explore waste-to-energy potentials. Five municipalities have been selected and are referred to as the 5-city program, which includes Depok City, Banda Aceh City, Jambi City, Bukittinggi City, and Malang Regency.

1.2 Background

As part of the decentralization process that started in 2001, the entire responsibility and execution of waste management shifted from the central government to the regional government and is now shared between the provincial and the city government. Since then, municipalities have taken a main role in the collection, transport, and disposal of municipal waste in the cities. Furthermore, reduction, reuse, and recycling initiatives have been introduced through many intermediary facilities that are both decentralized into community-level and/or maintained at the city-level. With a majority of municipal waste consisting of organic materials, cities are faced with over-burdened and deteriorating landfills with limited capacity. The limited capacity of final disposal sites and the limited capacity to address source separation and treatment of organic fractions affect the quality of the entire waste

management system. Organic waste is currently not treated as a resource and is therefore largely wasted in the waste chain process.

Apart from the generic waste management activities, the municipality is also responsible for the entire planning and implementation of waste management services, which include preparation and allocation of the financial budget necessary for the waste services. An estimation from the Ministry of Home Affairs suggests that the allocation for waste management is less than 1% of the municipal budget in many cities in Indonesia. Concurrently, the volume of waste is increasing rapidly, while dumping and illegal handling of waste is common in the country as well as the discarding of plastics into the environment and sea. The public financing of the waste management sector is inadequate, and there is a need to better understand and assess more in-depth the present and planned public financing allocations and spending in the waste management sector.

According to a World Bank report from 2012, the lack of priority of financing the waste management system, both in national and local budgets, has been referred to as one of the most problematic issues for the waste sector. A thorough model on waste financing flows, both at national and local levels, as well as the interlinkages between the two governance levels is highly needed to address the challenges in the Indonesian waste sector more effectively.

1.3 Objective

The objective of the present study is to identify and describe the financial allocations and flows earmarked for the waste management sector in Indonesia, including capital investments for facilities and, more importantly, operational budgets, which are part of expenditures at the city level. Additionally, an identification of any fiscal allocation (policy and implementation) at the national level that supports the improvement and implementation of waste management at the city level is also sought. Based on this overview and analysis, recommendations will be made of why and how to increase public and private funding for solid waste. The study will also focus on public finance issues, but will also partly look at opportunities for additional international and national finance to the sector.

1.4 Scope of Work

The scope of work of this study includes desk study, collection of all relevant data and information on waste financing (past, present, future), an analysis of the collected data and information, recommendations for future needs for public and external financing of the waste sector, as well as consultations and meetings with related stakeholders (national and international institutions) in Jakarta.

In particular, the analysis of this study includes an investigation of waste management systems in the entire process from sorting, collection, transport to final disposal with an emphasis on financial needs and requirements for setting-up and operating effective and sustainable waste management systems at the local level. During the study, it was necessary to engage the identified stakeholders at the national and municipal level to obtain necessary information and data as well as to investigate influential factors to the economy of waste management. Furthermore, it was important to understand whether changes in the financial allocations to the waste management sector over the years have brought about significant changes in the waste management and/or if municipal operations are still operated as business as usual.

National stakeholders identified in this study consist primarily of public institutions involved in financing and managing solid waste in Indonesia, i.e. the Ministry of Finance (MoF), the National Development and Planning Agency (Bappenas), the Ministry of Public Works and Housing (MoPWH), KLHK, the Ministry of Home Affairs and the selected cities (Malang Regency, Banda Aceh City, Depok City, Bukittinggi City, Jambi City) that are involved in the SSC between the Government of Denmark and the Government of Indonesia. The international stakeholders consist of international institutions comprising the largest scale actors with significance in the sector at the national level as well as currently supporting funds that are preparing projects in the waste sector, i.e. the World Bank and the German Financial Development Cooperation (KfW).

1.5 Output

The consultancy work for this study is expected to deliver the following outputs:

1. Inception note describing initial and generic financial stakeholders and waste financing allocations and flows in Indonesia
2. Stakeholder consultation and dissemination of interim notes/draft report to the recipient
3. Final report with description and analysis of public funding of solid waste management in Indonesia, including an in-depth description and analysis of the five cities
4. Presentation of the report with analysis and recommendations at a workshop in Jakarta

1.6 Methodology

The study started with a desk study and/or literature review in order to gather all secondary data and information available, mostly on the current regulations related to the local government, public financing and its mechanisms, national

and local budget systems, retribution, and the like, as well as the basic waste data of the selected cities and their financial figures, owned by KLHK. Based on the collected secondary data and information, the list of related questions were prepared for different stakeholders in order to verify the collected information as well as to collect some primary data and information needed. Then, meetings and discussions were conducted with each relevant stakeholder at the national and municipal levels. Subsequently, an in-depth analysis of all collected data and information, both primary and secondary data, was conducted. During meetings with related stakeholders, a discussion was also directed towards opportunities and/or plans to improve the current situation. Finally, based on these findings, the study wrapped up with conclusions and recommendations for future improvement as needed.

During the study, the following activities were undertaken:

- Describe/map the current generic financial situation and the actual financial flows at the national level relating to the waste management sector and, if possible, plans for future budget allocations and new plans/policies for the sector
- Describe and assess fee collection methods, fee levels and collection rates of waste
- Identify and describe financial form from central to local government levels that serve as support to the implementation of waste management activites, both from the perspective of capital and operational aspects
- Describe/map the current financial models, allocations, and actual financial flows at the local level relating to the waste management sector, and when possible, potential future change based on known, upcoming policies. This point should also include cost recovery of operational costs, i.e. tariffs and fees at local level
- Make a simple description of the local budgetary system and indicate how and where fits in
- Provide analysis of the trend of public finance of waste management during the last five years.
- Provide an overview of the local budgets and expenditures for the selected cities
- Provide an analysis for possible future public funding in the selected cities in oreder for them to achieve Jakstranas target
- Provide analysis of what is needed in terms of public funding for developing and operating sustainable and effective waste management services in the future (sorting, collection, handling, and other activites)
- Clarify supporting factors that may contribute to the rationale and city decision making in waste management financing prioritisation with focus on the selected municipalities
- Include, where relevant, additonal financial information and analysis related to present or planned waste-to-energy inititives.

2. Current Condition of the Waste Management Sector

2.1 Current Waste Management Status and Implementation

The decentralization that started in 2001 has transferred many central government responsibilities to local governments (cities/regencies and provincial governments), including the primary responsibility of delivering solid waste management services. The Regional Government Act 23/2014 classifies waste management under concurrent Government Affairs, which has been included as a mandatory sector of government responsibility. This implies that waste management services should be provided by each local government by sharing responsibilities among the three levels of government. In providing the service, the local government should play the leading role as the main service provider and the local regulator of waste management by referring to the national laws and targets. Moreover, waste management is considered a cross-sectoral affair as it is encompasses two sectors of government affairs: The Public Works & Spatial Planning sector and The Environmental Sector. The division of responsibilities in waste management among the three levels of government for each of the two sectors has been defined in the Regional Government Act outlined in Table 1 below.

Table 1 Division of Responsibility for Solid Waste Management based on Regional Government Act 23/2014

National Government	Provincial Government	City Government
Government Affairs in Public Works & Spatial Planning Sector		
a. Determining the development of a solid waste management system nationally b. Developing the solid waste management system across provincial boundaries and a waste management system for national strategic interests	Regional waste management and system development	City/Regency waste management and system development
Government Affairs in the Environmental Sector		
a. Issuance of permits for waste-to-energy facility b. Issuance of permits for the utilization of landfill gas to energy at regional landfill by the private sector c. Assisting and supervising waste handling at regional landfill/TPST by private sector d. Determining and supervising the producers' responsibilities in waste reduction initiatives/activities e. Assisting and supervising the producers' responsibilities in waste reduction initiatives/activities	Waste handling at Regional landfill/TPST	a. Implementation of Waste Management b. Issuance of permits for recycling/treatment of waste, transportation of waste, and final processing of waste organized by the private operators c. Assisting and supervising the implementation of waste management organized by the private sector

Source: Regional Government Act 23/2014

Overall, the leading ministries involved in sub-national affairs are the Ministry of Home Affairs and the Ministry of Finance. The Ministry of Home Affairs has the purview of administrative issues, including related legislation, while the Ministry of Finance manages the sub-national fiscal policy, including the allocation of funds to the regions. In addition, technical ministries with a stake in the waste sector include KLHK; and the Ministry of Public Work and Housing. Thus, in 2017, a specific demarcation of responsibilities between these two ministries was defined leaving KLHK to be responsible for all operational issues including pollution control, and the Ministry of Public Work and Housing as responsible for the planning and provision of infrastructure.

In terms of operations, the arrangement of the waste management system is generally divided into two main parts:

a. Primary collection to intermediate collection points (named "TPS") is usually organized quasi-independently by community organizations/neighbourhood associations (RT/RW). However, in some areas, the waste collection is directly organized by the municipality through door-to-door collection system. Based on a World Bank analysis from 2019, the primary collection system is generally organized by individual communities through charging users fees to finance operational costs, and thus, results in various approaches in workers' arrangements, frequency of collection, disposal patterns and payment structures. This situation is in line with an earlier study conducted by the German Cooperation for International Development (GIZ) (Soos et al., 2013) which found that the most common and dominant model applied for waste management in cities of low- and middle-income countries is neither private nor public service, but rather services provided by Community-Based Organizations (CBOs), Non-Governmental Organizations (NGOs) or the informal sector. As a result, there is almost no reliable waste or financial accounting conducted, specifically in this part of the systems, as analyzed by the World Bank (2019).
b. Intermediate collection points (TPS), transport, and final disposal, including the management of landfills, are organized by the local Environmental Agency (DLH), which is financed by the local budget.

Indonesia is a country with a total population of 267 million inhabitants with 55% of the population currently living in urban areas. A World Bank publication from 2018 estimated that the average waste generation in the country was 0.68 kg/capita/day, which amounts to the total waste generation of 66 million tons in that year. Bappenas stated in the RPJMN 2020-2024 that the current performance of waste management nationally reached 67% of waste handling and 2.26% of waste reduction at source. Waste reduction at source defined as the minimization of waste generated mainly through 3R initiatives, particularly at the source level that includes households, industries, etc. These were the figures estimated by Bappenas as the baseline to determine the national targets for the 2020-2024 term.

The waste management system currently in place still focuses on basic collection, transfer and disposal activities, with minimal recycling initiatives such as TPS3R, waste banks and the like. Moreover, in 2016 around 45% of the final disposal was still operated as open dumping based on statistics from KLHK. With an estimated current level of waste handled reaching 67% nationally, this implies that the remaining 33% is unhandled or uncollected. The high portion of uncollected waste reflects the ineffectiveness of the current systems, which ultimately contribute significantly to the leakage of waste into the environment, water bodies and the ocean. A study conducted by McKinsey in 2015 revealed that the sources of land-based leakage amounted to 75% coming from uncollected waste and 25% from formal waste management systems. Furthermore, according to Jambeck (2015), Indonesia is the world's second-largest contributor to plastic waste entering the oceans, after China.

Therefore, proper waste management is of great concern to the Indonesian Government as reflected in the national agenda, and the highly ambitious commitments made to improve the sector. In RPJMN 2020-2024, the Government of Indonesia highlights the need for an optimized and more integrated waste management system through the improvements in infrastructures and facilities, tariff retribution, technical capacity, institutional development and regulatory enforcement. As part of the National Waste Management Policy and Strategy (Presidential Regulation No.97/2017), the Government of Indonesia aims at a waste reduction of 30% and a waste handling rate of 70% by 2025. Additionally, the government has also pledged to reduce plastics and other marine debris by 70% in 2025 as stated in the National Action Plan on Marine Plastic Debris 2017- 2025 (Presidential Regulation 83/2018).

2.2 Current Financing Situation of the Waste Management Sector

According to a report published by ISWA (2015), the absence of waste management services, or the failure of such services in managing waste has greater negative impact on the environmental and social influence of waste. Moreover, a more sustainable and circular way of managing the waste currently offers additional economic benefits. Thus, implementing a proper sustainable waste management system makes even more economic sense, especially if the principle of 'polluter pays' is applied. In waste management, the costs incurred to provide the services usually include the cost for collection, treatment and disposal of waste, including both investment and operational costs. In general, approximately 90% of the total costs of the entire operations of waste management services are spent on collection, especially in the lowest income countries where waste is mostly dumped into the environment. ISWA (2015) defines capital/investment and operational costs as follows:

a. Capital or investment costs refer to the costs incurred for all those related to developing and constructing a project, among others: project preparation including planning, siting, feasibility studies, permitting and the associated public involvment and consultation; detailed design; land costs, especially in the costs of landfills; equipment, facilities and construction.

b. Operational costs refer to the costs of labour, fuel, energy, maintenance and repair, emission control and monitoring, revenue collection, public communication and management, and administration. Awareness raising campaigns, customer care, environmental auditors, and training and capacity building are also categorized as operational costs.

However, many studies have shown that it is extremely challenging to present standard costs for waste management, including both investment and operational costs. Although investment costs are relatively easy to benchmark, it is much more complex to obtain reliable comparative costs due to different settings and needs of the specific local context as well as technology adapted, component costs, environmental standards, etc.

Moreover, the operational costs are often overlooked and receive less attention. It can be difficult to estimate such costs even for cities with quite similar conditions due to different factors, such as different accounting systems, different methodologies used in data collection and analysis, unavailability and/or unreliability of data and information due to the sensitivity in sharing information that might be regarded as 'confidential' or problematic. It is highly challenging to analyze data across cities, particularly related to costs and revenues. The challenge arises not only in obtaining reliable data but also in further comparing 'apples and oranges' (ISWA, 2015).

In 2012, Wilson et al. conducted a comparative study of solid waste management in 20 cities from across countries. One of the parameters studied was the financial sustainability of waste management, where efforts were made to analyze the ability of a city to finance solid waste management. As data on actual costs incurred were both scarce and unreliable, the team used the city waste management budget. The authors concluded that compiling comparative – and comparable – data on costs and cost recovery proved to be particularly difficult because the accounting systems varied widely between cities; cost and budgeting mechanisms were often fragmented and scattered over several departments, and many cities were either unable or perhaps unwilling to share information. Comparing the data itself remains a challenge for the waste sector as different types of definitions are used even between stakeholders within the same city, while data collection systems might be unreliable. This is further complicated by the fact that several authorities and institutions are usually involved in data collection at different levels, even within the same cities or provinces.

Similarly, financing models of waste management often comprise various combinations in arrangements between client, operator, revenue collection

and investment finance, which often reflect local circumstances. Hence, there is no blueprint or one-size-fits-all solutions when it comes to financing models in waste management. The same goes for service delivery models, which often reflect many different hybrids and practices among countries, regions, cities or even local neighbourhoods. The generally applied model of service is, however, the public model, where the municipality serves as both client and operator, as is commonly practiced in Indonesia. Contrastingly, publicly-owned waste companies are employed in many other countries. In such service model, the publicly-owned waste company is in charge of the overall planning, management and execution, however, many services are outsourced and contracted to private service providers.

According to ISWA, the public model typically works well as long as sufficient budgets are allocated by the municipality to sustain the service levels. However, the system might be vulnerable to political factors and/or national economic issues. Moreover, the model usually runs as a cost center, not as a business that should put emphasis on the balance of costs and revenues as well as ensuring liquidity in order to maintain financial sustainability.

Generally, ensuring adequate services for waste management, which is considered as one of the public utilities, is the primary responsibility of the local municipality. In Indonesia, this responsibility has been formally stipulated in the Regional Government Act 23/2014, as previously explained. In terms of financing sources of government responsibilities, the Regional Government Act 23/2014 (Article 282) states that the implementation of government affairs under local government's authority, is funded by and at the expense of the local government budget (APBD). Meanwhile, the implementation of government affairs, which is included in central government responsibility at the regions, is financed by the state budget (APBN). This act also emphasizes that these two financial administrative roles should be arranged separately. As waste management is categorized as concurrent government affairs, the sources of financing of the waste sector is provided by the state budget (APBN), the provincial government budget (APBD Provinsi), and the city budget (APBD Kabupaten/Kota), depending on the specific types of activities and which level of government is responsible for each type of activity.

As clearly stated in Table 1, the implementation of waste management falls under the responsibility of the city government, which means that the city government should allocate a sufficient amount of their budget for waste management services from the municipal budget (APBD), under the Budget Implementation Document of the local Environmental Agency (DLH). However, based on the analysis by the World Bank (2019), the budget allocated for waste management in Indonesia, particularly for metropolitan and big cities, only reached 2.5% on average. This number is considerably smaller than the suggested budget allocated for waste management, namely at least 5%, which is usually required to provide adequate services. Findings from the aforementioned comparative study of 20 cities from across countries conducted by Wilson et al. (2012) revealed that 16 cities, covering each income

category, had allocated waste budgets ranging from 3% to 10% of the municipal budget, regardless of the level and quality of service. This range indicates the average budget spent on waste management in many cities from across countries and might furthermore indicate the ability and/or willingness to fund waste management services. Similarly to the study by the World Bank, ISWA holds that the total waste management costs should generally make up between 4% to 9% of the total municipal budget if sustainable and effective services are to be provided. Thus, it can be concluded that the average waste budget allocated in Indonesia lies well below the recommended average range of budget spent on solid waste services.

What is more, the World Bank has estimated that the 2.5% share of the municipal budget corresponds to 5 - 6 USD per capita, while the international benchmark shows that the required cost per capita ranges between 15 - 20 USD. Wilson et al. have also identified the average waste budget per capita that was spent by the 16 cities included in the study, both in total and as a percentage of GNI per capita, as presented in table 2 below:

Table 2 Financial Affordability

Country Income Level	City SWM Budget per Capita (USD)	City SWM Budget per Capita as % of GNI per capita (%)	
		Range	Average
High Income	75	0.03 – 0.40	0.17
Upper Middle Income	33	0.14 – 1.19	0.59
Lower Middle Income	10	0.40 – 1.22	0.69
Low Income*	1.4	0.14 – 0.52	0.32

Source: Wilson et al. (2012)
*Data only available for three of the six low-income cities (for 16 out of 20 cities in total)

Indonesia is currently categorized as a lower-middle-income country based on the World Bank income group category. Thus, when compared to the average budget per capita spent on waste management in other lower-middle-income countries, which is 10 USD per capita, the Indonesian waste budget per capita of 5 – 6 USD is considerably below the average.

Based on this study, Wilson et al. suggested, as a rule of thumb, if the cost for the entire waste management system is greater than, say, 1% of household income in low-income countries or 2% in middle-income countries, then it will likely not be affordable for the households. Based on this 'rule of thumb' indicating the upper limit of 1% per capita income, ISWA (2015) defined the affordability limit for total net cost of waste management, as follows:

Table 3 Affordability Limit

Country Income Level	Affordability limit for total cost of Waste Management (USD/tons)
High Income	>255
Upper Middle Income	120 - 255
Lower Middle Income	40 - 255
Low Income	<40

Source: ISWA (2015)

Additionally, according to ISWA (2015), the upper limit of affordability of other public utility services such as water and wastewater has been estimated within the range of 3% to 4% of per capita income, as quoted by UNDP and OECD.

Waste management is often referred to as an impure public good as the boundaries between the public goods and private goods are blurred (Cave, 2014). In economic terms, waste management can be considered to be a merit good when it is related to its significance for public health. This type of utility service is prone to 'free-rider' behavior and does not allow for a disconnection of service in case of late or non-payment without impacting others. Normally, the law requires this service to be provided for the benefit of the entire society, regardless of the market interest or the users' financial affordability (or willingness). Hence, in 2010 Scheinberg et al. emphasized that, although considered important, cost recovery is not the main focus of financial management in most cities.

In the Global Waste Management Outlook Report (2015), ISWA mentioned that cost recovery from user fees alone is more likely in high-income countries, simply because fees are set at an affordable level allowing full cost recovery in those countries. Moreover, the report also mentions that full cost recovery might not be fully achievable in the short-term in most low- and lower-middle-income countries.

As for Indonesia, the World Bank analysis has estimated that approximately less than 40% of all operational costs are recovered on average, as the operational budget itself still relies heavily on local budgets without a specific correlation between the cost levels and revenue. Schuebeler et al. in 1996 stated that the absence of a direct linkage between revenues and the actual level of service provision tends to undermine the accountability of local waste management institutions, and thus makes it more difficult to improve and/or extend the waste services. It is important to note that accountability is based on transparency and traceability of the source and the use of funds.

Eventually, financing of waste management is not the only particular issue to improve sector performance as both local and central governments should be able to cover most of the costs incurred. ISWA has also stated that the issues do not seem to be one of affordability and is not linked to low payment rates or to the way user charges are collected. The recent World Bank analysis revealed that even when a local government is allocating sufficient operational budget to waste management systems according to international standards, sector outcomes are almost always lacking, because of the severe deficit in infrastructure investments and technical capacity. So, in situations where sufficient funds might be available, effectiveness and efficiency of operations and use of funds might still be important issues to be addressed for improving the waste sector.

3. Waste Financing in 5 Cities

3.1 Malang Regency

Malang Regency is one of the largest regencies in Indonesia in terms of area, with the total area of 3,534.86 km^2 and a total population of 2,576,596 inhabitants. This regency consists of 33 districts and 390 sub-districts/villages. The capital city of Malang Regency is Kepanjen City with a total population of 108,655 inhabitants in 2018.

According to the National Waste Management Information System/SIPSN (KLHK, 2018), the total waste generated in this regency reached between 700-1000 ton/day with waste management services covering 60% of the total area in Malang Regency. Waste collected at waste banks reached 7.8%, while around 8.6% was treated at recycling facilities and approximately only 25.2% of the total waste was transported to the final disposal. It appears that not all of the waste generated in the coverage area could be fully handled as the amount of unmanaged waste reached 58.4% of the total waste generated in this regency. Also, it is important to note that the population in this regency is scattered and the regency itself is surrounded by nine mountains with a hilly geography and wide areas creating many challenges in terms of road access and waste collection. Therefore, the total waste collection (waste managed) is low, amounting to around 35.5% to 41.64% of the total waste generated in Malang Regency.

As for the financing of waste services in Malang Regency, the main source comes from the local government budget (APBD), which is earmarked under the budget implementation document of Malang Regency's Environmental Agency (DPA-DLH). The local budget is used mainly to finance the operational expenses in the waste sector, as shown in table 4. In addition to the local budget (APBD), Malang Regency has also been receiving support from the state budget (APBN), all in the form of assets, which are channeled through various types of funding for the provision of waste management infrastructure and supporting facilities/equipment (capital investment). These include the Specific Allocation Fund, Co-administered Fund, Local Incentive Fund, as well as the vertical fund from the technical ministry (Ministry of Public Work and Housing). In addition to that, this regency also received support from a few donors (grants provided by the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP)) and a state-owned enterprise of power generation (Java-Bali) under a corporate social responsibility (CSR) scheme. Support from the UN ESCAP was provided in the form of a waste-to-energy facility (Anaerobic Digester and its supporting equipment) including planning and design. The state-owned enterprise on power generation provided the TPS3R facility in a priority zone of their region (Sumber Pucung - Karang Kates).

Based on data from the Environmental Agency of Malang Regency, the average local budget (APBD) earmarked for waste management in 2013-2019 reached merely 0.30% of the total local government budget (APBD).

Table 4 Percentage Allocated Budget for Waste Management Services in Malang Regency (2013 - 2019)

Fiscal Year	APBD (Total Local Budget)		SWM Budget		Allocation for SWM
	Million IDR	Million USD	Million IDR	Million USD	%
2013	2,529,686	176	7,592	0.53	0.30
2014	3,058,671	213	8,332	0.58	0.27
2015	3,439,632	239	9,998	0.70	0.29
2016	3,448,452	240	9,736	0.68	0.28
2017	3,919,236	273	11,048	0.77	0.28
2018	3,719,088	259	13,107	0.91	0.35
2019	4,001,643	278	13,671	0.95	0.34
Average					**0.30**

Source: Environmental Agency of Malang Regency (2019); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

Furthermore, on average more than 75% of the total waste management budget of Malang Regency (APBD) is allocated for operational expenses.

Table 5 Percentage of OPEX from the total Waste Management Budget in Malang Regency

Fiscal Year	OPEX		CAPEX		Total SWM Budget		OPEX	CAPEX
	Million IDR	Million USD	Million IDR	Million USD	Million IDR	Million USD	%	%
2015	7,934	0.55	2,064	0.14	9,998	0.70	79.35	20.65
2016	8,548	0.59	1,188	0.08	9,736	0.68	87.80	12.20
2017	8,564	0.60	2,483	0.17	11,048	0.77	77.52	22.48
2018	10,395	0.72	2,711	0.19	13,107	0.91	79.31	20.69
2019	7,978	0.56	5,693	0.40	13,671	0.95	58.36	41.64
Average							**76.47**	**23.53**

Source: Environmental Agency of Malang Regency (2019); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

Being the only revenue generated in the waste sector, the contribution of waste retribution revenue to the total waste management budget in Malang Regency only reached 6.92% on average, as shown below.

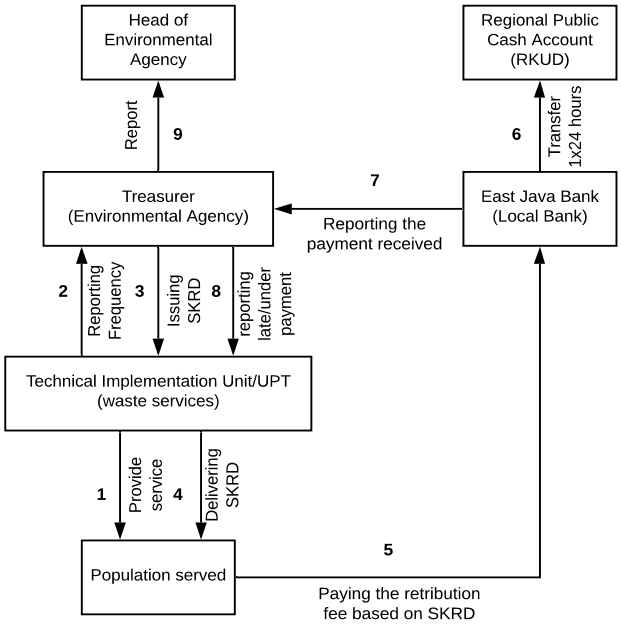
Table 6 Contribution of Waste Retribution Revenue to Waste Management Budget in Malang Regency

Fiscal Year	SWM Budget		Waste Retribution		% Waste Retribution Revenue to SWM Budget
	Million IDR	Million USD	Million IDR	Million USD	
2010	5,752	0.40	301	0.02	5.25
2011	5,159	0.36	332	0.02	6.44
2012	4,443	0.31	345	0.02	7.77
2013	7,592	0.53	361	0.03	4.76
2014	8,332	0.58	386	0.03	4.64
2015	9,998	0.70	352	0.02	3.52
2016	9,736	0.68	420	0.03	4.31
2017	11,048	0.77	837	0.06	7.58
2018	13,107	0.91	1,638	0.11	12.50
2019	13,671	0.95	1,700	0.12	12.43
Average					**6.92**

Source: Environmental Agency of Malang Regency (2019); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

Malang Regency has just recently enacted a recent Local Regulation on General Service Levies in 2018 (Local Regulation 7/2018), in which the local government has been cooperating with a local bank, East Java Bank, in order to avoid administrative leakage (i.e. direct payment to the Bank) as well as to increase the collection of waste retribution (optimizing the revenue) and tracking/monitoring the payment. It is the idea that the retribution will then be transferred to the Regional Public Cash Account (RKUD) within 24 hours, as

shown in Figure 1. The Environmental Agency of Malang Regency is currently trying to implement this method incrementally to all users served in the coverage area.



SKRD = Regional Retribution Ticket

Figure 1 The collection method of waste retribution in Malang Regency

Source: The Environmental Agency of Malang Regency (2019)

In the recently enacted Local Regulation on General Service Levies, the tariff of waste retribution has been adjusted according to the National Standard (SNI 3242:2008) with the basic estimation of the tariff set towards cost recovery. In principle, the tariff rate has been set for each component of the waste management services, including source collection, temporary collection point (TPS) and transport to final disposal by considering the initial investment costs (excluding the replacement cost). The applicable tariff will then depend on the system applied within the neighbourhood. Some neighbourhoods might need to pay starting from collection at source, while others might only pay transportation costs up to final disposal. In some areas, waste collection at source to the temporary collection point is organized by the neighbourhood association (RW), and the tariff is then split between collection (charged by RW staff) and TPS to landfill (charged by the Environmental Agency). In practice, the tariff charged to the users is the total single tariff, which already combines these two parts of services (by the neighbourhood and by the Environmental Agency).

This situation reflects the conclusion of the World Bank analysis stating that the tariff system itself is too complex and often cumbersomely split between

collection and transport/disposal. The applicable waste retribution tariff classification in Malang Regency is listed in Annex 3.

In the future, the Environmental Agency of Malang Regency plans to increase the local budget allocated for waste management by optimizing the waste retribution revenue. Thus, the dependency on subsidy from the local budget will decrease incrementally as the waste revenue gradually increases.

3.2 Depok City

Depok City is part of the Greater Jakarta metropolitan region and is included in the category of Metropolitan City. Depok City has a total population of 2,179,813 and covers a total area of 200.29 km^2. It is a highly densely populated city with a population density of 11,635 inhabitants/km^2, owing to the city's role as a satellite city to Jakarta, as many citizens of Depok City cross-commute to the capital every day.

According to SIPSN (KLHK), the total waste generated in Depok City reached 1,320 tons/day in 2018 with waste management services covering almost 60% of the total area of the city. The portion of waste collected at waste banks reached 5%, while around 11% of the waste was diverted to treatment facilities, consisting mainly of composting facilities (10%). Approximately 45% of the total waste was transported to landfills, and the remaining 39% was unhandled.

The financing source of the waste sector comes from the city budget (APBD), earmarked under the budget implementation document of the Environmental Agency of Depok City (DPA-DLH). The city budget is mobilized to finance the operational expenses of waste management in the city. The state budget (APBN) has also been used mostly to support the provision of waste management facilities/equipment and infrastructure. Support from the national budget originates from the Specific Allocation Fund, Local Incentive Fund, as well as from the technical ministry (Ministry of Public Work and Housing). The Local Incentive Fund granted was only for the first phase as Depok City was not able to fulfill the requirements to receive funding in the next phase. Apart from the public funding, Depok City has never received any support from donors or any other international sources.

During the discussion with the Environmental Agency of Depok City, the officials agreed to submit the required data, especially the budget allocated for waste management via email. However, the requested data for further analysis was never received, and the data used to analyze the waste management financing in Depok City is thus based on information from KLHK and the Ministry of Finance as well as a study prepared by the Coordinating Ministry for Economic Affairs on National Waste Management Policy and Strategy from 2015.

On average, the local budget (APBD) allocated for the local agency responsible for waste management (DLH) is 6.81%, as presented in Table 7. Nevertheless, this allocation trend is an estimate. It should be noted, though, that this data was obtained from various sources. In addition to that, as the agency (DLH) itself is not solely responsible for the waste sector, hence, it cannot be ensured that the indicated budget is mobilized for waste management purposes alone. Furthermore, the reflected budget for the fiscal year 2016 shows an allocation of 13%, which is very unlikely to be correct if it was allocated only for the waste sector, particularly when considering the current sector performance and a moderate level of service area coverage (60%) and the high percentage of unmanaged waste (39%). According to a study prepared by the Coordinating Ministry for Economic Affairs in 2015, the DLH's budget allocation (budget not specifically intended for the waste sector) ranked within the top 5 among 23 existing local government working units.

Table 7 Percentage Allocated Budget for the Environmental Agency of Depok City (2010-2017)

Fiscal Year	APBD (Total Local Budget)		DLH Budget		Allocation
	Million IDR	Million USD	Million IDR	Million USD	%
2010	1,283,574	89	39,925	2.78	3.11
2011	1,579,042	110	41,385	2.88	2.62
2012	1,854,609	129	44,529	3.10	2.4
2013	1,817,101	126	77,915	5.42	4.29
2014	2,097,915	146	106,868	7.43	5.09
2015	2,178,595	152	161,941	11.27	7.43
2016	2,755,256	192	375,404	26.12	13.63
2017	2,956,844	206	277,966	19.34	9.4
Average					**6.81**

Source: KLHK (2018), MoF (2019), Study of National Waste Management Policy and Strategy by the Coordinating Ministry of Economic Affairs (2015); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

On the revenue side, the average revenue of waste retribution in Depok City only contributes to 5.27% to the total budget of the Environmental Agency, as shown below.

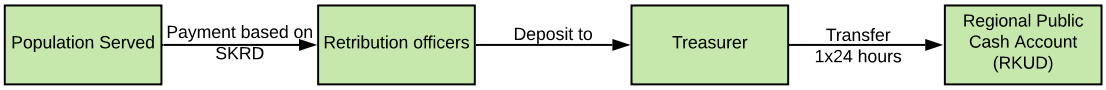
Table 8 Contribution of Waste Retribution Revenue to the Budget of the Environmental Agency in Depok City

Fiscal Year	DLH Budget		Waste Retribution		% Waste Retribution Revenue to DLH Budget
	Million IDR	Million USD	Million IDR	Million USD	
2010	39,925	2.78	2,393	0.17	5.99
2011	41,385	2.88	2,387	0.17	5.77
2012	44,529	3.10	2,479	0.17	5.57
2013	77,915	5.42	3,469	0.24	4.45
Average					**5.27**

Source: The Ministry of Finance (2019); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

Depok city has recently enacted a regulation on waste retribution in 2019 (Local Regulation 5/2019) mainly on an adjustment of the tariff. According to the Local Regulation 5/2019, the tariff structure is measured based on the services provided, the category and volume of the waste generated. In the previous regulation (Local Regulation 5/2012), the collection mechanism of waste retribution was only described in general terms, and still followed the generally practiced mechanism in most cities in Indonesia, as shown in Figure 2. However, based on a discussion with the Environmental Agency of Depok

City, there will be an adjustment in the current collection mechanism. In the future, the waste retribution will be combined with the water utility bills, particularly in areas served by both water and waste services. However, this initiative is still at a very early stage, and the issue is being discussed by the Environmental Agency of Depok City and the Water Utility (PDAM).



SKRD = Regional Retribution Ticket

Figure 2 General Collection Mechanism of Waste Retribution

Source: Analysis (2020)

In general, the most commonly-practiced mechanism in collecting waste retribution is usually done manually by retribution officers. Each month, the population served by waste services will receive the SKRD/retribution ticket, which states the nominal amount to be paid. Direct payment is made in cash from each user to the retribution officer. Then, all the cash receipts collected by the retribution officer will be handed over to the treasurer of the waste management division or other service departments. The treasurer must deposit all cash receipts within the local government treasury within 24 hours of receipt. The retribution officer is usually managed under the organizer of the local neighbourhood or area, such as staff assigned by RT/RW (Neighbourhood Association), staff assigned by the traditional market, staff assigned by area manager, etc.

3.3 Banda Aceh City

The city of Banda Aceh has a total of 254,904 inhabitants and is categorized as a medium city in Indonesia. The total area of this city is 61.36 km^2. Banda Aceh City belongs to the territory of the Province of Nanggroe Aceh Darussalam where special autonomy has been granted by the Republic of Indonesia based on Act 18/2001 on Special Autonomy for Special Province of Aceh.

The total waste generated in this city amounts to 210 tons/day, and the waste services cover 90% of the total area. Based on SIPSN (KLHK, 2018), less than 0.24% of the total waste generated is collected at waste banks, and around 13.14% of the waste is treated at treatment facilities such as composting, recycling, and biogas facilities. Approximately 86.1% of the waste is transported to final disposal, while the remaining 0.5% is unhandled. Currently, the existing final disposal of Banda Aceh City serves as transfer stations where all the collected waste from collection vehicles are transferred into larger trucks for disposal at the regional landfill of Blang Bintang, located 15 – 20 km from the city landfill. According to the agreement with the provincial government, Banda Aceh City can only dispose a maximum of 180 tons waste/day at the regional landfill, which is just about enough capacity to serve

the existing waste trend. The tipping fee currently charged by the provincial government is IDR 13,500/ton and will be increased further in 2020.

The main source of financing for waste management in Banda Aceh City is coming from the city budget (APBK), which is earmarked under the budget implementation document of the Environmental Agency of Banda Aceh (DPA-DLH). The local budget (APBK) is mainly utilized to finance the operational expenses of waste management in the city. A small portion of the city budget is also mobilized to finance the provision of supporting infrastructure and facilities such as construction of composting halls and collection points. Apart from the local budget, Banda Aceh City also received support from the state budget through Specific Allocation Funds (Physical), Special Autonomy Funds, as well as from the technical ministry (the Ministry of Public Work and Housing and KLHK). All of these allocations were provided based on proposals from the city government. Thus far, Banda Aceh City has not yet received any support from the private sector or any other sources for activities in the waste sector.

The total budget earmarked for waste management in Banda Aceh City is only 2.18% on average of the total local budget, as shown in Table 9. This portion is below the average estimation of the World Bank analysis on the waste budget allocated by the cities. In order to provide proper waste services that cover 90% of the total area, a sufficient budget would need to be allocated and mobilized. Nevertheless, the total local budget (APBD) allocated for waste management service of 90% coverage area in the current fiscal year has been increased to IDR 32,767,122,040.

Table 9 Percentage Allocated for Waste Management in Banda Aceh City (2014-2018)

Fiscal Year	APBD (Total Local Budget)		SWM Budget		Allocation for SWM
	Million IDR	Million USD	Million IDR	Million USD	%
2014	1,134,104	79	24,813	1.73	2.19
2015	1,217,410	85	20,931	1.46	1.72
2016	1,248,393	87	27,988	1.95	2.24
2017	1,213,750	84	27,327	1.90	2.25
2018	1,135,914	79	28,454	1.98	2.5
Average					**2.18**

Source: The Environmental Agency of Banda Aceh City (2020); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

As for the average revenue of waste retribution, Banda Aceh City would need to further encourage and enforce the implementation as the contribution of waste retribution revenue to the total waste management budget only reached 16.5%, as shown in the table below.

Table 10 Contribution of Waste Retribution Revenue to the Waste Management Budget in Banda Aceh City

Fiscal Year	SWM Budget		Waste Retribution		% Waste Retribution Revenue to SWM Budget
	Million IDR	Million USD	Million IDR	Million USD	
2014	24,813	1.73	3,758	0.26	15.15
2015	20,931	1.46	3,878	0.27	18.53
2016	27,988	1.95	4,065	0.28	14.52
2017	27,327	1.90	4,755	0.33	17.4
2018	28,454	1.98	4,946	0.34	17.39
Average					**16.53**

Source: The Environmental Agency of Banda Aceh City (2020); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

The waste retribution has been stipulated in the Local Regulation (Qanun 5/2017) on Retribution of Waste Service, which is developed based on Act 28/2009 on Regional Government Taxes and Service Charges (retributions). The tariff structure is organized based on the source category (object) and its size (object), as listed in Annex 3. As for the collection mechanism, the Environmental Agency of Banda Aceh is generally practicing the most common collection mechanism. However, in Banda Aceh, the staff of the retribution unit in the Environmental Agency also serves as a retribution officer, and the users are thus paying the retribution directly to the treasurer of the Environmental Agency, as shown in Figure 3. Finally, the treasurer must deposit all cash receipts to the local government treasury within 24 hours of receipt.

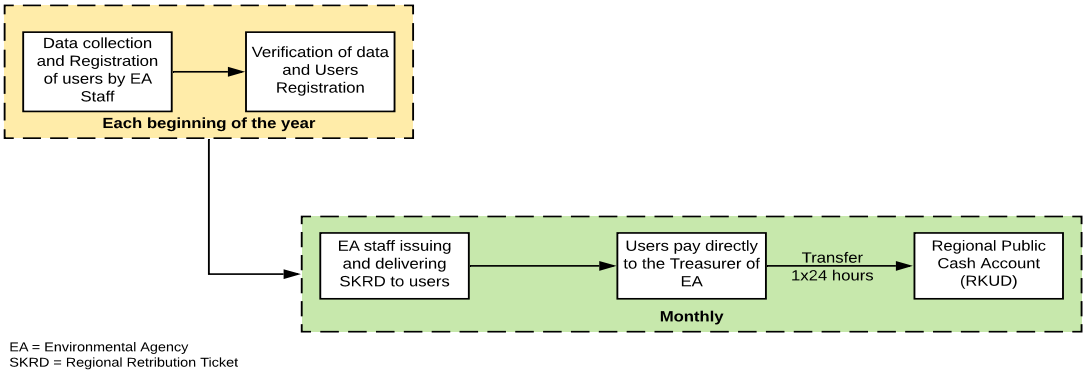


Figure 3 Collection Mechanism of Waste Retribution in Banda Aceh City

Source: Analysis (2020)

3.4 Bukittinggi City

The City of Bukittinggi has a total population of 126,804 inhabitants and a total area of 25.24 km^2. Based on the number of people living in the city, Bukittinggi City is categorized as a medium city in Indonesia. Bukittinggi City is the meeting point of traders from surrounding cities, particularly during market days (Wednesday and Saturday) where traders from nearby cities come to Banto Trade Centre for larger trading (vegetables and fruits). Thus, the waste

generated from markets in the City of Bukittinggi amounts to 24.5% of the total waste generated. This situation occurs mainly because of the Banto Trade Centre meeting point, increasing the amount of waste generated in the city, particularly by the traders from nearby cities.

The total waste generated in Bukittinggi City per day is approximately 154.42 tons and the coverage area of waste services is 90% of the total area. Only 3.6% of the waste is collected at waste banks, while around 65% of the waste is transported to final disposal. Based on SIPSN (KLHK), the rest of the waste, amounting to around 30.9% is treated at composting or recycling facilities, and the city also claimed to have less than 0.5% of unhandled waste.

Similar to other cities, the main source of financing the city's waste management is coming from the local budget (APBD), which is earmarked under the budget implementation document of the Environmental Agency of Bukittinggi City (DPA-DLH). The local budget (APBD) is mainly mobilized to finance the operational expenses and a small portion is used to finance the provision of waste infrastructure and facilities. APBN also supports the city in providing, mostly, waste management infrastructure and facilities through Specific Allocation Funds. As the Environmental Agency of Bukittinggi City only submitted the requested data without confirming on phone to further discuss and clarify the data submitted, it is unclear whether the city has also received funding from the technical ministries. However, Bukittinggi City did receive support from the Indonesian state-owned Bank (Bank BNI) for the provision of waste bins. Apart from that, no other financial support has been provided to the city government for waste management.

The average local budget (APBD) allocated for waste management in Bukittinggi reached only 0.61% of the total local government budget, as shown in the table below. This allocation is remarkably low and indicates inconsistency when considering the claimed wide coverage service area of 90% and a low level of unhandled waste (0.5%). Moreover, this figure lies well below the average range estimation of the World Bank analysis (2.5%).

Table 11 Percentage Allocated for Waste Management in Bukittinggi City

Fiscal Year	APBD (Total Local Budget)		SWM Budget		Allocation for SWM
	Million IDR	Million USD	Million IDR	Million USD	%
2014	595,424	41	3,271	0.23	0.55
2015	593,323	41	3,823	0.27	0.64
2016	647,045	45	4,042	0.28	0.62
2017	710,039	49	4,961	0.35	0.7
2018	783,824	55	4,223	0.29	0.54
Average					**0.61**

Source: The Environmental Agency of Bukittinggi City (2020), the Ministry of Finance (2019); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

In regards to the revenue, the contribution of waste retribution revenue into the waste management budget in Bukittinggi City reached 18.5% on average, as shown in the table below.

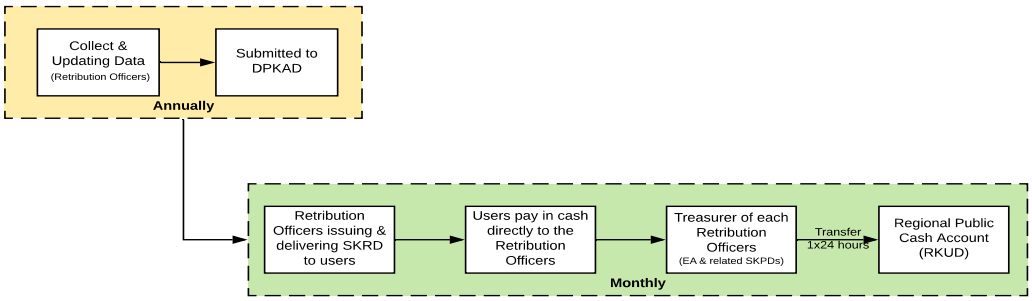
Table 12 Contribution of Waste Retribution Revenue to the Waste Management Budget in Bukittinggi City

Fiscal Year	SWM Budget		Waste Retribution		% Waste Retribution Revenue to SWM Budget
	Million IDR	Million USD	Million IDR	Million USD	
2014	3,271	0.23	403	0.03	12.33
2015	3,823	0.27	590	0.04	15.45
2016	4,042	0.28	846	0.06	20.93
2017	4,961	0.35	914	0.06	18.44
2018	4,223	0.29	1,001	0.07	23.7
Average					**18.48**

Source: The Environmental Agency of Bukittinggi City (2020); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

In general, provisions related to waste retribution have been clearly regulated in the Local Regulation 5/2014 on Retribution of Waste Service, which is referring to the Act 28/2009 on Regional Government Taxes and Service Charges. According to the Local Regulation 5/2014, the tariff classification is determined based on the source category (object) as well as the volume of waste generated, as listed in Annex 3. As for the collection mechanism, the Mayor Regulation 37/2014 has been enacted as a technical guideline for the collection of waste retribution.

Basically, the collection mechanism practiced in Bukittinggi follows a similar pattern of retribution collection mechanism as in Banda Aceh that started with data collection to identify the users (population served). Annual data collection is conducted by the Environmental Agency of Bukittinggi City (retribution section) with close coordination with related local government working units (SKPD), which then used to identify the potential revenue. In the case of Bukittinggi, the retribution officer, who collects the retribution from the users, consists of not only staff from the Environmental Agency but also from SKPDs. For instance, the local market agency will be responsible for managing the collection of retribution at traditional markets. The collection mechanism and related SKPDs involved in the collection of retribution are further defined in the figure below.



DPKAD = Regional Finance & Asset Management Agency
EA = Environmental Agency
SKRD = Regional Retribution Ticket
SKPD = Local Government Working Unit
Retribution Officers include = EA; Market Agency,;Transportation, Communication & Information Agency; DPKAD; Water Utility; State Electricity Company; Sub-districts staff, other related SKPD

Figure 4 Collection Mechanism of Waste Retribution in Bukittinggi City

Source: Analysis (2020)

3.5 Jambi City

Jambi City is the capital city of Jambi Province with a total population of 591,340 inhabitants and an area of 205.38 km^2. Considering the size of the population, Jambi City is categorized as a big bity in Indonesia. Batanghari River, which is one of the longest rivers in Sumatra, flows through the city of Jambi. The area near Batanghari River is located in lowlands and considered the most exposed area to floods, which is why many inhabitants live in stilt houses due to the risk of flooding.

In Jambi City, the waste management service coverage reached 100% of the total area with a waste generation of 461.25 tons/day. Nevertheless, the portion of uncollected waste is still high, amounting to around 35.9% of the total waste generated in the city. Only 0.1% of the total waste generated is collected at waste banks and around 3.3% has been diverted from landfill into composting and recycling facilities. The remaining 60.7% of the total waste generated is transported to final disposal. Currently, the city of Jambi is constructing a sanitary landfill with the support of the German Financial Development Cooperation (KfW) through a loan administered by the Ministry of Public Works.

During data collection, efforts were made to contact the Head of Environmental Agency of Jambi City, however, there was no confirmation for a phone discussion. Therefore, the data used in analyzing the waste management financing in Jambi City refers to the Waste-to-Energy Baseline Survey in Jambi City published by UN ESCAP. Although the data used in the baseline survey report is relatively old (2010 to 2013), it is assumed that the trend of percentage allocation would not be much different from the range as applied today, since the waste management system itself has not yet been improved with advanced technology that would increase the budget quite significantly.

Financing of waste management services in Jambi City is similar to other cities in Indonesia where the local budget (APBD) is the main financing source. The local budget for waste management is earmarked under the budget implementation document of the Environmental Agency of Jambi City (DPA-DLH). The local budget is mainly mobilized to finance the operational expenditures, while support from the APBN is generally mobilized for the provision of waste infrastructure and supporting facilities. Jambi City has many experiences in receiving support from donors, both in the form of grants and loans. A grant was provided by UN ESCAP in 2015 for the provision of waste-to-energy treatment technology (anaerobic digestion). Moreover, a loan, provided by the KfW and administered by the Ministry of Public Work, is currently used to finance the construction of sanitary final disposal in Jambi City as mentioned above.

Based on the previous report of the baseline survey (2015), the average budget allocated for waste management in Jambi City only reached 1.3%, as shown in Table 13.

Table 13 Percentage Allocated for Waste Management in Jambi City

Fiscal Year	APBD (Total Local Budget)		SWM Budget		Allocation for SWM
	Million IDR	Million USD	Million IDR	Million USD	%
2010	662,897	46	4,518	0.31	0.68
2011	814,323	57	11,301	0.79	1.39
2012	952,960	66	19,301	1.34	2.03
2013	1,164,032	81	11,953	0.83	1.03
Average					**1.31**

Source: Report of Waste-to-Energy Baseline Survey, UN ESCAP (2015); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

In the city of Jambi, the contribution of waste retribution revenue to the waste management budget reached 47.8%, which is rather high compared to other cities.

Table 14 Contribution of Waste Retribution Revenue to the Waste Management Budget in Jambi City

Fiscal Year	SWM Budget		Waste Retribution		% Waste Retribution Revenue to SWM Budget
	Million IDR	Million USD	Million IDR	Million USD	
2010	4,518	0.31	6,994	0.49	154.8
2011	11,301	0.79	6,300	0.44	55.75
2012	19,301	1.34	3,907	0.27	20.24
2013	11,953	0.83	5,314	0.37	44.46
Average					**47.83**

Source: Report of Waste-to-Energy Baseline Survey, UN ESCAP (2015); 1 USD = IDR 14,374 (Average of last 90 days: www.xe.com, accessed 5 April 2020)

The Waste Retribution in Jambi City is stipulated under the Local Regulation 2/2012 on Levies of General Services, which basically refers to the Act 28/2009 on Regional Government Taxes and Service Charges. Based on this regulation, the tariff classification is determined based on the category of waste source (object) as listed in Annex 3. In the Local Regulation 2/2012, the collection mechanism of waste retribution is only described in general terms, which mainly follows the most common mechanism practiced in cities, as previously shown in Figure 2. The common mechanism in collecting retribution is practiced manually, where the retribution officers are delivering the SKRD/retribution ticket stating the amount billed each month to each user. The users pay in cash directly to the retribution officer. Afterwards, all cash receipts are collected by the retribution officer and brought to the treasurer, who will then deposit to the local government treasury within 24 hours.

4. Financing of the Waste Management Sector

4.1 Financing Sources

In principle, there are two main funding sources to finance waste sector activities, capital investments and operational expenditures, i.e. state budget (APBN) and local government budget (Province and City/Regency APBD). The financing arrangement between the three-levels of government mainly refer to the division of authority in the waste sector.

APBN is not only used to finance the central government spending at the central level, particularly the ministries/agencies, but also to finance central government spending at the regional level through the ministries (Vertical Funds) as well as Deconcentrated & Co-administered Funds.

In APBN, a portion of the budget is earmarked for fiscal transfers to the local government (transfers from APBN to APBD). In the waste sector, the fiscal transfer funds are usually mobilized to finance capital investments. Based on discussions with selected municipalities and information collected, there are four categories of fiscal transfers that is associated with the waste sector, namely Specific Allocation Fund (DAK), Local Incentive Fund (DID), Special Autonomy Fund (Dana Otsus) and Village Fund (Dana Desa). All of these fund transfers are then included in the local government revenue alongside the local own-source revenues on the local government budget (APBD) as shown in Figure 5.

The local government budget is mainly used to finance operational expenditures of the waste management sector. As shown in Figure 6, on the revenue side of the APBD, there are two financing sources associated with waste management, i.e. the local own-source revenues (waste retribution fees) and the central government transfer (fiscal transfers from the APBN to the APBD). It should be noted that fiscal transfers (transfers from the APBN to the APBD) are mainly used to finance the capital expenditures of waste management. Nevertheless, recently, one of the fiscal transfer funds from the central government has also been earmarked to provide incentives for 12 cities implementing the Waste-to-Energy facility, based on the Ministerial Regulation of the Ministry of Environment and Forestry 24/2019.

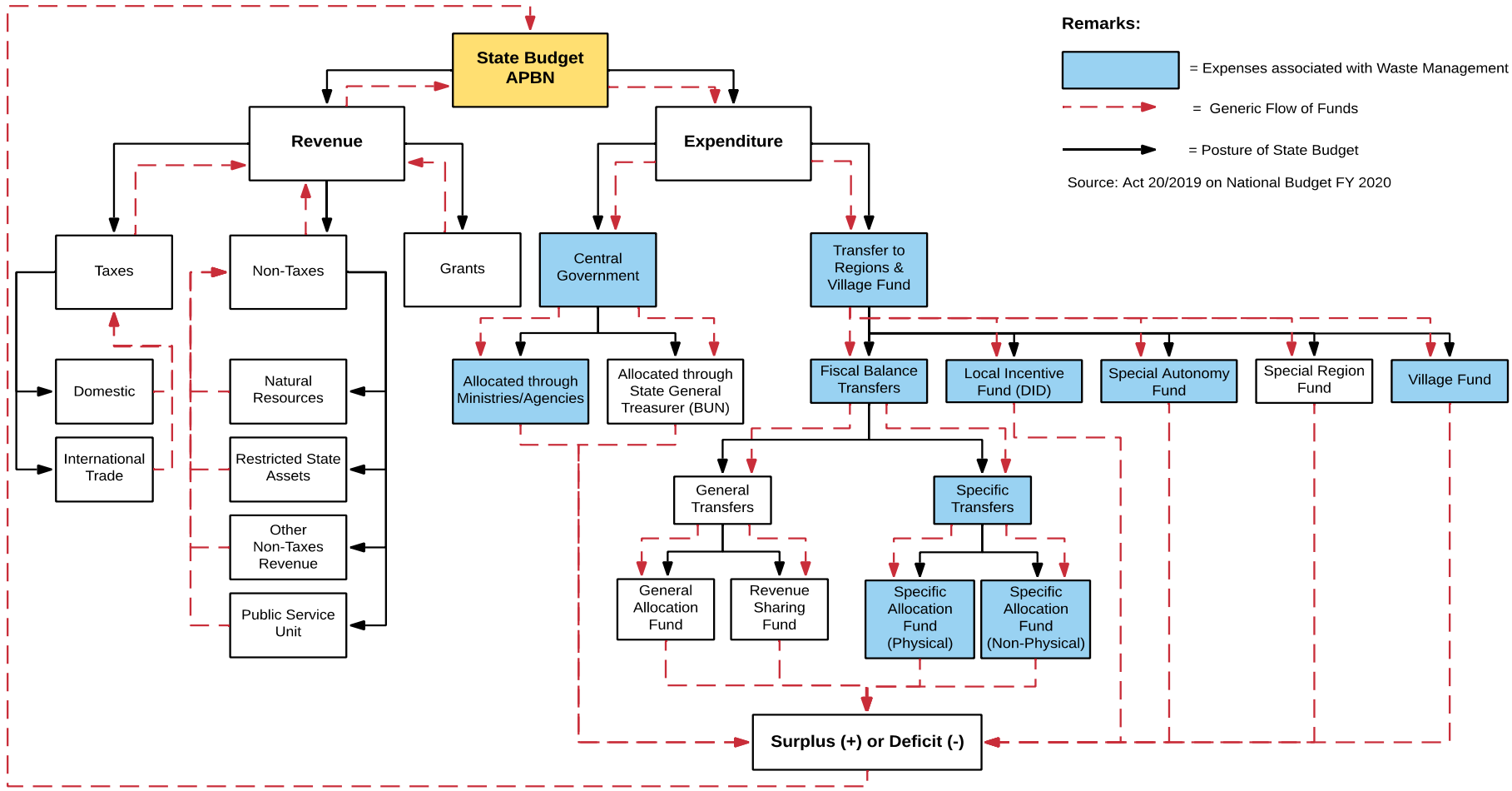


Figure 5 Financing Source of the Waste Sector in the National Budget

Source: Analysis based on Act 20/2019 on National Budget, 2020

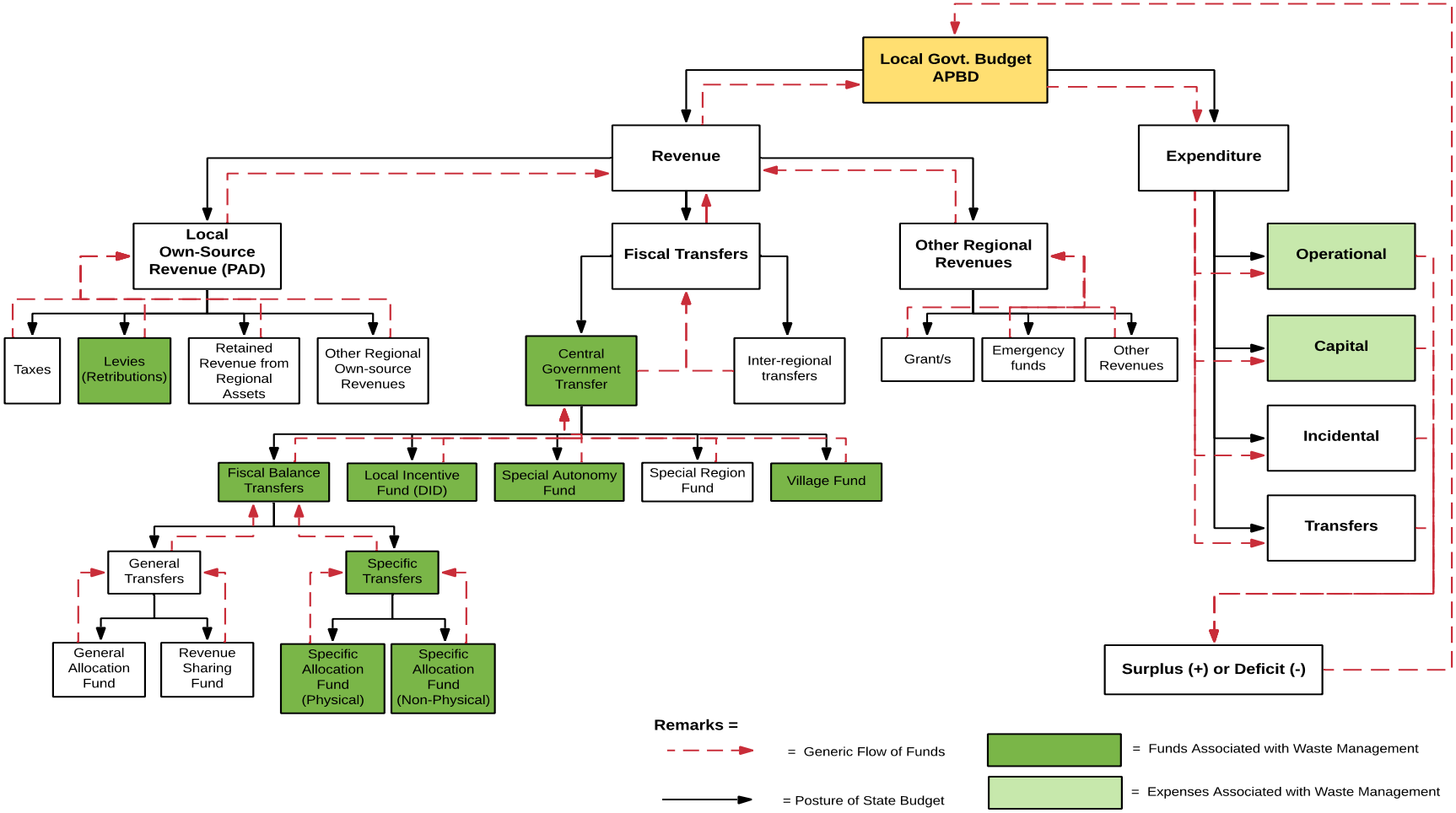


Figure 6 Financing Source of the Waste Sector in the Regional/Local Budget

Source: Analysis based on GR 12/2019 on Regional Finances and Ministerial Regulation 33/2019 (MoHA), 2020

On the expenditure side of the APBD, expenses related to waste management consists of operational expenditure and capital expenditure, which refers to the Annual Work and Budget Plan (RKA SKPD) or the budget documents of the local government working unit responsible for waste management. The operational expenditure of waste management will be further discussed in the next section.

Apart from government support in financing the waste sector, development partners and private sectors also provide support in this sector, mainly in the form of capital investments and technical assistance. Support from the private sector is mostly provided under CSR schemes, while support from the development partners to the waste sector will be discussed in another sub-section.

All of the public financing source used to finance waste management, as well as its policy implementation, are identified as follow:

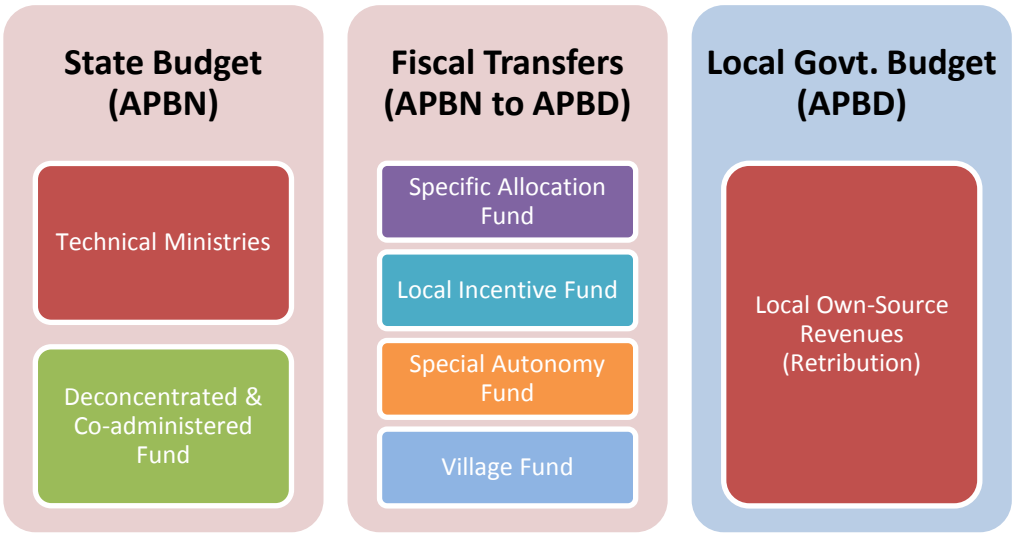


Figure 7 Public Financing Sources in the Waste Sector

Source: Analysis (2020)

Table 15 Public Financing Sources and Relevant Regulations

Financing Sources	Relevant Law/Regulations	Concerning
APBN:	Act 17/2003	State Finances
	Presidential Regulation 78/2019	Details of the National Budget FY 2020
	GR 45/2013 and 50/2018	The procedures for implementing the State Budget
Technical Ministries	PMK 173/PMK.05/2016 (Updated PMK 168/PMK/2015)	Budget Implementation Mechanism of Government Assistance in Ministries/Agencies
	PermenLHK P.12/MenLHK/Setjen/Kum.1/2/2017	General Guidelines for channeling other Government Assistance in the MoEF
	PermenPU 24/PRT/M/2016	Budget Implementation Mechanism of Government Assistance in MoPWH
Deconcentrated and Co-administered Fund	GR 07/2008	Deconcentrated and Co-administered Funds

Financing Sources	Relevant Law/Regulations	Concerning
	PMK 248/PMK.07/2010 (Updated PMK 156/PMK.07/2008)	Guideline in the management of Deconcentrated and Co-administered Funds
Fiscal Transfer (APBN to APBD):	Act No 33/2004	Fiscal Balance between Central & Regional Governments
	GR No 55/2005	Balancing Funds
	PMK 121/PMK.07/2018	Management of Transfer to Regions and Village Funds
Specific Allocation Fund	Presidential Regulation 5/2018 (Perpres 123/2016 updated)	Technical Guidelines of Specific Allocation Funds - Physical
	Perpres 88/2019	Technical Guidelines of Specific Allocation Funds (Physical) FY 2020
	PMK 130/PMK.07/2019	Management of Specific Allocation Funds (Physical)
	PMK 48/PMK.07/2019	Management of Specific Allocation Funds (Non-Physical)
	PermenLHK P104/MENLHK/SETJEN/KUM.1/12/2018	Operational Guidelines of Specific Allocation Funds (Physical)
	PermenLHK P24/MENLHK/SETJEN/KUM.1/5/2019	Incentive (waste tipping fee) for the 12 cities applying waste-to-energy facilities
	PermenPUPR 33/PRT/M/2016	Technical Guidelines of Specific Allocation Funds (Physical)
	PermenPUPR 21/PRT/M/2017	Operational Guidelines of Specific Allocation Funds (Physical)
Local Incentive Fund	PMK 141/PMK.07/2019	Management of Local Incentive Funds
Special Autonomy Fund	Qanun Aceh 1/2018	The utilization of the Special Autonomy Fund
	Governor Regulation 26/2019	Distribution and channeling of financial assistance of Special Autonomy Funds to the LGs in Aceh province
Village Fund	PMK 205/PMK.07/2019	Village Fund Management
	PermenDES 11/2019	Prioritization of Village Fund FY 2020
	PMK 49/PMK.07/2016	Procedures of the allocation, distribution, utilization, monitoring and evaluation of Village Fund
APBD:	GR 12/2019	Management of Regional Finances
	Permendagri 13/2006 & 21/2011	Guidelines of Regional Finances Management
Local own-source revenues (Waste Retribution)	Act 28/2009	Regional Government Taxes & Service Charges (Retributions)

4.2 Budgeting System

The following section outlines the procedures entailed in formulating the local and state budgets relating to the waste sector. In general, the budgeting of the two main public financing sources for the waste sector principally refers to and is linked with the development planning. The budgeting was designed as such in order to achieve the goals set in the national development plan. The five-year development plan (RPJMN), which corresponds to the overall 20-year development plan (RPJPN), is running in parallel with the five-year term of office of the President. Basically, the five-year plan thus elaborates on the government's priorities as well as the policy agenda in the following five year-

term. The RPJMN is a fixed comprehensive plan of the five years, which is executed each year through the Annual Work Plans and linked to the budgeting process. In the mid-term development plan of 2020-2024, waste management has been included in the national priorities, particularly in strengthening infrastructure to support economic development and basic services (by improving access to a proper waste management system); and in relieving the environment, improving disaster resilience and climate change (by increasing waste handling and reduction rate). The relation between development planning and budgeting is shown below.

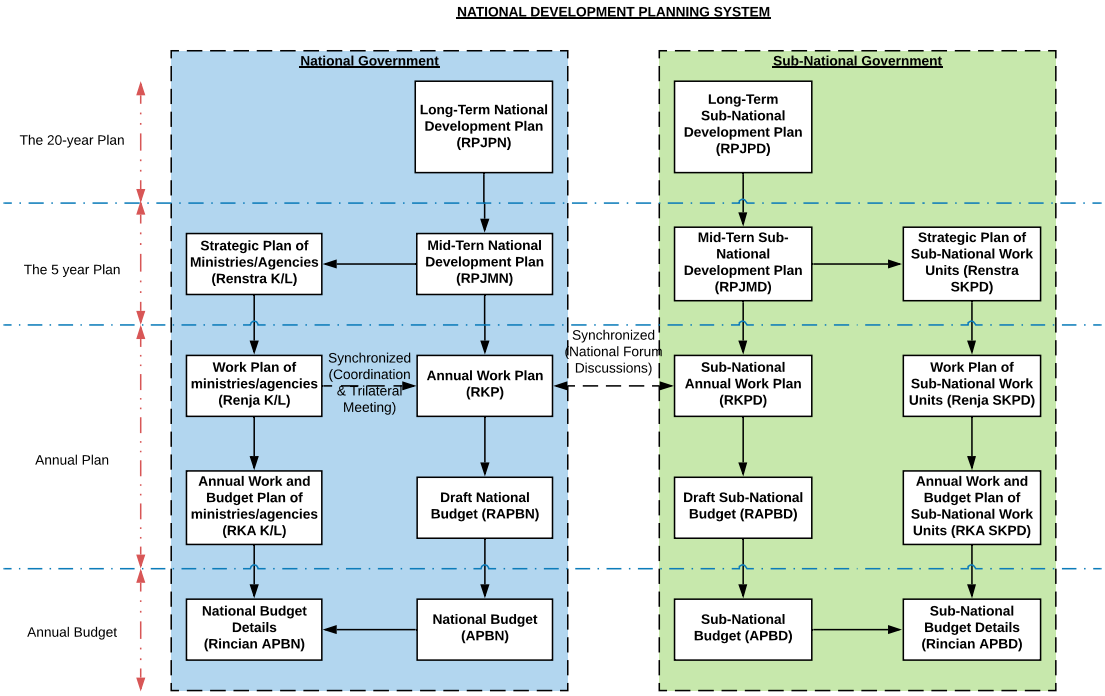


Figure 8 Diagram of Development Planning

Source: Adapted from the RPJMD Synchronization Module - RPJMN health sub-sector, Bappenas (2016)

Additionally, the planning and budgeting system applied in Indonesia could be considered rather unique, compared to the typical central planning model, as the two functions are not executed under one single ministry. The core planning function lies within Bappenas, while the budgeting function is executed under the Ministry of Finance. Nevertheless, these two functions complement each other through close coordination, synchronization and trilateral meetings together with technical ministries.

Both long-term and mid-term development planning are set to aim at broader goals after which specific activities at the national and local level are then further identified in order to achieve these targets and goals. All strategic plans at ministries/agencies and local government working units as well as Annual Work Plans at all levels are formulated by referring to the five-year development plan (RPJMN). Subsequently, the public budgets are prepared

based on the Annual Work Plans to ensure that activities planned are also in correspondence with and aimed at achieving the targeted goals.

In principle, the public budgeting system in one fiscal year follows certain sequences that includes the budget formulation phase (planning and budgeting); implementation phase; documentation and reporting; and auditing. This cycle applies for both state budget and local budget, repeated every fiscal year.

In particular, the process of formulating the state budget at the beginning of the year starts with identifying national priorities and policy directions, including the indicative budget, based on the five-year plan (RPJMN). Thereafter, all these are used as the basis to formulate the government's Annual Work Plan (RKP) that is basically detailing the national priorities as highlighted in the RPJMN. The RKP provides a general framework for the ministries/agencies to prepare the individual ministry-specific Annual Work Plans (Renja-KL) and ministry-specific Work Plans and Budgets (RKA-KL).

In February of the given year, the Ministry of Finance starts to establish the level of financial resources available, which will be continually refined until the budget proposal is finalized. At this stage, economic assumptions and revenue forecasts are estimated in order to establish the indicative maximum level of expenditures (indicative budget ceilings) under the government's deficit target. The draft RKP and new program initiatives will be adjusted according to the established indicative budget limits.

Around March, Bappenas and the Ministry of Finance issued a joint budget circulated to all spending ministries. This budget will become the guideline for preparing the specific work plans (Renja K/L), including the indicative budgetary limits. Meanwhile, the Macroeconomic Framework and Fiscal Policies Principle (KEM PPKF), which essentially is a pre-budget report, will be prepared. This Macroeconomic Framework and Fiscal Policies Principle includes a description of the macroeconomic framework, fiscal policies and priorities, fiscal risk analysis, deficit target, revenue projections and proposed expenditure ceilings for the upcoming budget year.

In the current fiscal year (2020), the waste sector has been taken into account particularly in the macroeconomic framework, as waste issues can pose a threat to economic growth and productivity, especially in primary sectors such as agriculture and fisheries (marine ecosystems). These threats can potentially disrupt food supplies and eventually increase the price of commodities, which is considered an important element of food security. Considering these conditions, the inflation rate is thus adjusted to a certain level.

After the submission of the Macroeconomic Framework and Fiscal Policies Principle and Annual Work Plan (RKP) to the Parliament in May, discussions will be held with the Budget Committee. During this phase, each ministry will have discussions with their respective sectoral commissions in the Parliament on the ministry-specific work plans and proposed expenditures. According to an OECD

analysis from 2009, these discussions generally focus on small and detailed items of expenditures rather than a general overview with potential changes in the composition of the budget, not the aggregate budget ceilings. Normally, the pre-budget discussion on the macroeconomic framework takes approximately one month to conclude. The final government Work Plan (RKP) will be issued by the President no later than mid-May.

After an agreement has been reached on budget ceilings by mid-June, the Ministry of Finance issues a revised budget circular, which includes preliminary budget ceiling for the ministries' programs. Thereafter, the draft Annual Work Plan (Renja K/L) and the draft Annual Work and Budget Plan (RKA-KL) should be revised accordingly and then submitted by mid-July. Before the ministries submit the RKA K/L, the Ministry of Finance and Bappenas will review the documents further to ensure its synchronization with the government Work Plan (RKP) and compliance with the budget ceilings. The Ministry of Finance then finalizes the budget documentation and prepares the budget proposal with the accompanying financial notes. Prior to the Independence Day, the President usually delivers a budget speech to Parliament as well as presents the state budget proposal (RAPBN). Following the delivery of RAPBN, discussions between ministries, Budget Committee, and sectoral commissions at the Parliament take place until October. The state budget proposal usually gets a final approval by the Parliament in October, which is followed by drafting the budget details (Presidential Regulation stipulated in November), re-adjustment of Annual Work and Budget Plan, and preparation of the Line Ministries Budget Document (DIPA K/L). In December, the DIPA K/L will be submitted to the Ministry of Finance so that budget implementation can start in January the following year.

According to the OECD analysis from 2009, the Indonesian Parliament is involved in more detail and on more occasions throughout the budget formulating process than parliaments in other OECD countries. Considering that the pre-budget phase is only exemplary, the OECD recommends that it would be more beneficial if the involvement focused more on budget policy in more aggregate and strategic terms. On the other hand, the government could assist by providing appropriate high-level budget documentation rather than the very detailed work plans in order to focus more on inter-sectoral allocations of funding and thus take on a greater role in setting the overall budget policy as suggested by the OECD.

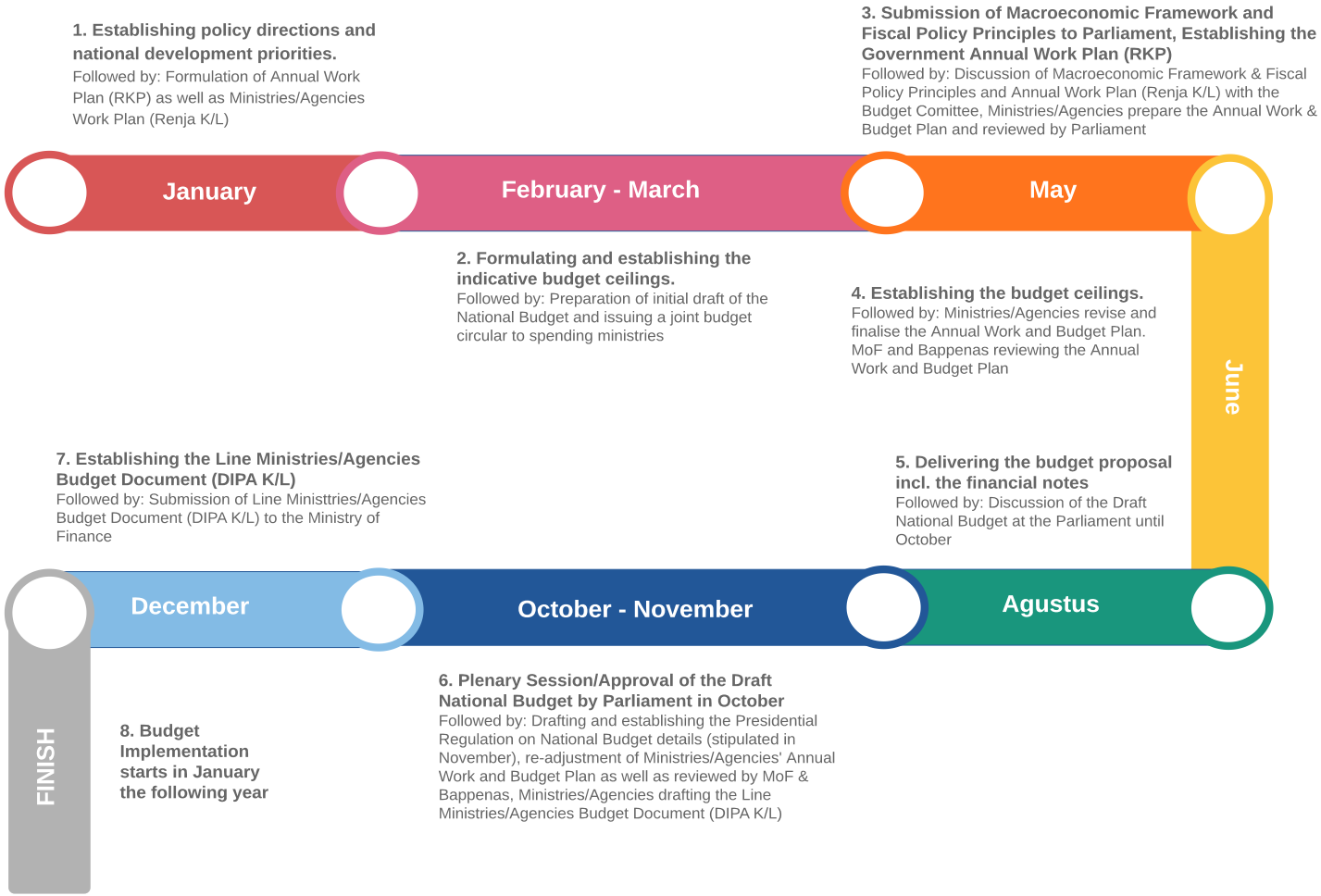


Figure 9 Formulation of State Budget (APBN)

Source: Adapted from the Guidelines of Planning, Budgeting and Implementation of the State Budget, Ministry of Finance (2015)

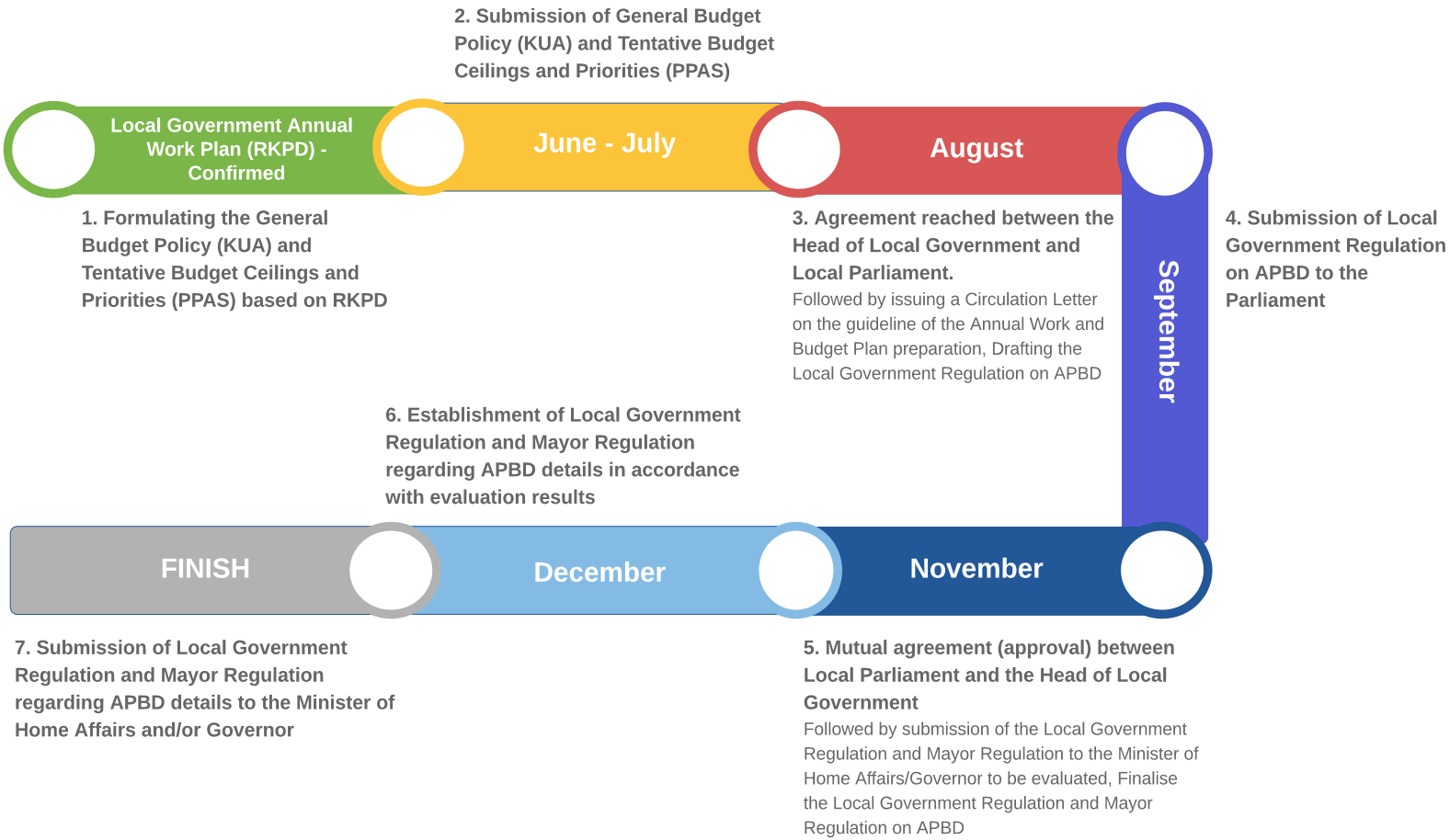


Figure 10 Formulation of Local Budget (APBD)

Source: Analysis (2020)

Basically, the process of budget formulation at the city/regency level follows the same principle and sequences, where the budget is proposed based on budget ceilings and priorities according to the Annual Work Plan of the local government. After discussions, an agreement is reached between the Head of Local Government and the Local Parliament on the budget ceiling, its policies and priorities. Subsequently and in parallel with drafting the local government regulation on Local Budget, a circulation letter regarding the guideline of the Annual Work and Budget Plan will be issued for the local government working unit to prepare the Annual Work and Budget Plan. Both must be submitted in September and will be discussed further before final approval by the Local Parliament in November. Thereafter, the local regulation and mayor regulation on Local Budget and the details must be submitted to the Ministry of Home Affairs and/or Governor to be further reviewed. Finally, the local government regulation and Mayor Regulation concerning APBD details in accordance with evaluation results will be stipulated in December.

4.3 Operational Expenditures

The Government Regulation (GR) 12/2019 on Regional Financial Management defines operational expenditure as the budget expenditure intended to finance the daily activities of local governments that provide short-term benefits. This reflects the main purpose of maintaining the assets and ensuring that planned activities are implemented accordingly. The GR 12/2019 specifies several types of operational expenditures in the local budget. As for the waste sector, operational expenditures only covers direct costs of Goods & Services Expenditure that consists of supplies, cleaning equipment including safety apparels and cleaning agents, vehicle maintenance, fuels, rent mobility equipment, rent (land) mobility, collection, and transport services. Meanwhile, the Personnel Expenditure that includes salaries and on-costs, are usually covered through Fiscal Transfer from the state budget (DAU).

In waste management, the operational costs incurred by the local government, and in particular for the Environmental Agency, are entirely originated from the local budget (APBD). The percentage amount budgeted for waste management, particularly of the four cities with the coverage service area of 60% to 100% (Malang Regency, Banda Aceh City, Buktittinggi City, Jambi City), varies greatly between cities ranging from 0.3% to 2.18% from the total local budget. The figures range below the average amount estimated by the World Bank analysis of 2.5%, specifically for big and metropolitan cities. Among the four cities, the highest average allocated budget for waste management is 2.18% from APBD, which was allocated by the Environmental Agency of Banda Aceh City. Nevertheless, based on the recent World Bank analysis, a higher budget of 5% or more would be generally required to finance adequate service of the current system. Additionally, according to the historical data for the past few years, the waste management budget trends in Malang Regency and

Banda Aceh have slightly increased, while in Jambi and Bukittingi the trends are still fluctuating.

Principally, revenues refer to annual revenue requirements needed to cover the net costs of providing waste management services that generally come from public financing sources (ISWA, 2015). The only revenue in the waste sector originates from waste retribution revenue, and the amounts recovered are in general very low. For instance, among the five cities, the cost recovered varies from the lowest of 5.3% in Depok City to the highest of 47.8%, in Jambi City. In order to cover all waste management expenses, the gap is usually covered by subsidizing from other local government revenues. This signifies that the operational expenditures of waste management services rely heavily on local government subsidies, as is also stated by the World Bank. Moreover, according to the World Bank (2019), forecast revenues from service charges are not considered in determining costs and budgets, even though such forecast revenues are entered on the revenue side of the local government's budget (APBD). Thus, ultimately, the final budget allocation will require final approval from the local parliament, which is usually based on competing priorities and budget ceilings.

Basically, this is correlated with the overall budgeting system, as explained in sub-chapter 4.2. As mentioned by the OECD in their analysis of budgeting in Indonesia (2009), there are constitutional provisions that mandate the level of allocations to certain sectors, which indicates rigidities in the budgeting process. However, such an issue could be overcome by establishing a minimum budget allocation for the waste sector at a certain percentage of APBD by formal regulation, in order to provide at least a basic service level.

A provision related to waste retribution has been stipulated by Act 28/2009 on Regional Government Taxes and Service Charges (retributions). Based on this Act 28/2009, waste management service is classified into the object of retribution under the category of General Service. This reflects the main purpose of the service being mainly to serve the public for societal benefits. That is to say that waste management services are not undertaken on a commercial basis. Activities considered as the object of retribution in waste management service include:

a. Collection at source to intermediate collection points (TPS);
b. Transportation of waste at source (door-to-door collection) and/or from intermediate collection points (TPS) to the final disposal; and
c. Land acquisition for final disposal sites

Public facilities are excluded from the object of waste retribution, including public roads, parks, places of worship, etc.

According to Article 151 of Act 28/2009, the retribution is estimated based on the level of service provided and the tariff level. The level of service charged is determined based on activities that occurred in delivering the services. For

example, waste services provided in some area only covers transport to final disposal, while in other areas they may start from the collection at source to final disposal. In case the level of service is difficult to measure, then it can be estimated based on a specific formula set by the local government. In setting the tariff, the local governments usually refer to the National Standard (SNI 3242:2008) to estimate the cost in providing the services. However, this standard has never been updated and thus does not correspond to the current price level. Currently, related ministries are restructuring the tariff retribution based on recent developed standard unit costs of waste management, coordinate with Bappenas, under the Directorate of Environment.

In principle, the Act 28/2009 emphasizes that the tariff charged should be sufficient to cover operating costs, depreciation and interest, by also considering the equity principle and affordability of the service charge for the affected community. This principle is in accordance with the basic principle emphasized by ISWA (2015) that users should all pay for waste management services that are equitable and affordable to them and proportional to the amount of waste they generate. Nevertheless, Article 152 (third item) also mentions that the tariff set should fully take into account the cost in providing services, yet the tariff is set only to cover a portion of the costs. Moreover, this Act also states that the tariff should be adjusted at least once every third year by considering price index and economic growth. In practice, many local governments are still enacting local regulations on waste retribution issued five years ago. This calls for regular updates of the local regulations or a more flexible system. It is worth noting however, that sometimes keeping fees low stems from political rather than affordability considerations (ISWA, 2015).

The collection method of the waste retribution varies across cities, as illustrated in the previous chapter. However, in principle the retribution is collected using the Regional Retribution Form (SKRD) or other similar forms, such as tickets, coupons or subscription cards. Article 160 states that the procedure to collect the waste retribution is further determined by local government regulation. According to ISWA (2015), the methodology in collecting revenues would work better if it depended on local practice and culture. For instance, in a place where service delivery is traditionally provided through community-based systems or in places with strong decentralization, it would make more sense to establish a cost-based transparent system through direct user charges.

In regard to retribution revenue, all collected retribution is deposited in the Regional Public Cash Account (RKUD) and then accounted as local own-source revenues (PAD). Subsequently, this revenue is combined with other local revenues to finance-related activities for the coming fiscal year. Article 161 states that each type of retribution revenue should be prioritized to finance activities directly related to the service provided. This implies that waste retribution revenue should be mobilized to finance service provided in waste management (collection, transport, and final disposal).

However, based on ISWA experiences in many countries and traditionally in many cities, where local governance might be weak and decision making centralized, both direct fees and other revenues intended for the solid waste services often flow into a general municipal account where the funds tend to be absorbed by overall expenditures, rather than applied to the intended purpose of waste management. It is not unusual that waste retributions are collected to cover other general expenses than waste management services. It is thus important to ensure that waste charges are kept separate from the general budget/expenditure system to ensure that these are used to finance waste services. This is also necessary for establishing a system that provides an overview of the income and expenditures required for developing a financially viable service delivery system.

Furthermore, when waste charges are absorbed by the general local treasury the traceability of public funds is being further complicated, especially if the collected fees and revenues are transferred to the central government before being redistributed to the local level.

Apart from the local own-source revenues, the operational expenditures of waste management from the local budget are also earmarked from the national budget through fiscal transfers (Specific Allocation Fund – Non-Physical), as mentioned in the sub-chapter 4.1. Nevertheless, this fund is provided as an incentive for tipping fees for the 12 cities operating the waste-to-energy facilities, based on Regulation (MoEF) 24/2019 on waste management service fee, which by far has not yet been channeled.

As shown in Figure 11, the operational expenditure in waste management is financed through a combination of City APBD and fiscal transfers from APBN to APBD, i.e. Specific Allocation Fund (Non-Physical). Currently, most of the waste-to-energy facilities are still being developed and have not yet been fully operating. Therefore, almost 100% of the operational expenditure is coming from the City APBD, i.e. from retribution.

As previously mentioned, the Directorate of Environment of Bappenas is currently coordinating with all related ministries in the re-structurization of waste retribution tariffs in order to increase the revenue of the waste sector. The tariff is re-structured based on standard unit costs of waste management. According to discussions with several related ministries, the tariff has been reviewed, however, it should be further evaluated through a public assessment before it is stipulated through a Ministerial Regulation (the Ministry of Home Affairs). The restructuring of waste retribution also includes the optimization of retribution collection, which at present is being considered to be integrated with the electricity bill.

Figure 11 Funds mobilized for OPEX

Source: Analysis (2020)

4.4 Capital Expenditures

According to the Government Regulation 12/2019 on Regional Financial Management, capital expenditures represent budget expenditures for the acquisition of fixed assets and other assets that provide benefits for more than one accounting period. In particular, for the waste sector, capital expenditure consists of 3 subcategories including land costs, transport equipment, and waste treatment plants.

As pointed out in sub-chapter 4.1, capital expenditures are mostly financed from the state budget, either through the technical ministries or Fiscal Transfers to the local government. Although, a small portion of the local budget (channeled through fiscal transfer) might also be used to finance capital expenditures, the difference is only in the type of infrastructure or facility funded. The state budget is usually mobilized to finance larger infrastructure, specifically landfills, as well as treatment facilities such as i.e. TPS3R, Recycling Centres (PDU) and supporting equipment of such facilities. As for the infrastructure at the regional scale, the provincial government budget (APBD Province) is usually mobilized to finance this type of infrastructure. Meanwhile, the city government budget is usually mobilized to finance the collection, transfer, and transport components of the waste management system, including intermediate collection points, small scale treatment facilities and the like. Nevertheless, it is also commonly practiced to apply blended public financing schemes to finance infrastructure in a city. For instance, in the construction of a landfill, the state budget is mobilized for the design and civil works, wastewater treatment plant as well as the provision of heavy equipment in the landfill. Meanwhile the city budget (APBD) is mobilized for the installation of the drainage system, road access, fences, weighing bridge and the like. On the other hand, the provincial budget (APBD Province) is used to support some of the heavy equipment, water quality monitoring equipment, workshops as wellas other supporting facilities. It should be noted that there is no standard arrangement for this blended scheme. Hence, each city may apply different arrangements by considering which types of public budgets are eligible to finance certain types of infrastructure or facilities.

As for the direct support from the state budget, two technical ministries are currently channeling the support of larger-scale waste infrastructure and facilities. The main types of infrastructure/facilities provided by these technical ministries vary, and the support is influenced by the vision and targeted goals to be achieved by each ministry. In general, the mechanism in providing support to the local government is similar, which is provided in the form of assets and by following the government system. Both ministries emphasize that project proposals should be initiated by the local governments in order to develop a sense of ownership of the waste facilities proposed, which in turn will encourage the local governments to operate and maintain the facility properly in the future.

Based on discussions with the local governments, the most common mechanism in the provision of waste infrastructure and facilities from the national government (ministries) is by granting the infrastructure or facilities in the form of assets. This means that the ministry will be the one constructing the facilities and taking care of the procurement. After completion, the assets will be officially transferred to the local government. During the transfer of assets from the national government to the local government, a record of transfer will state that the local government has agreed to allocate a budget for the operation and maintenance of assets.

Furthermore, the ministries have set some requirements or readiness criteria as prerequisites for the local government in proposing projects or applying for support. These criteria mainly consist of ensuring land availability including its certificate as well as a commitment letter to allocate budget for the operation of the proposed facility. All these requirements should be fulfilled when processing the requested proposal, otherwise, the State Treasury Office (KPPN) and the National Public Procurement Agency (LKPP) will not approve the proposal to be further processed. After all requirements have been fulfilled, the ministries will then verify all these documents/letters and readiness before taking the final decision in regard to its feasibility. Finally, the ministries will proceed for procurement and implementation. These processes will take time depending on the scale and complexity of the project, and the budget will have to be included in the line ministry budget (DIPA K/L), thus the proposal must be submitted as early as possible.

Apart from direct support from the state budget channeled through the ministries, financing capital expenditure from the state budget is also mobilized through fiscal transfers to the local government budget. In the waste sector, as previously stated, different types of support are mobilized through fiscal transfer including the Specific Allocation Fund (DAK), Local Incentive Fund (DID), Special Autonomy Fund and Village Fund. Although none of the cities reviewed in the report received support from the Village Funds for the waste sector up until now, the Ministerial Regulation of Village has listed support for waste facilities as one of the prioritized support to be financed using Village Funds in the fiscal year of 2020.

Figure 12 displays the sources of funds used to finance the capital expenditures, where two types of funds i.e. funds from technical ministries and Specific Allocation Fund, have been identified as the most common fund used according to discussion with the cities. In addition to that, Table 16 outlines the summary of the funding scheme and type of infrastructure/facility based on financing sources.

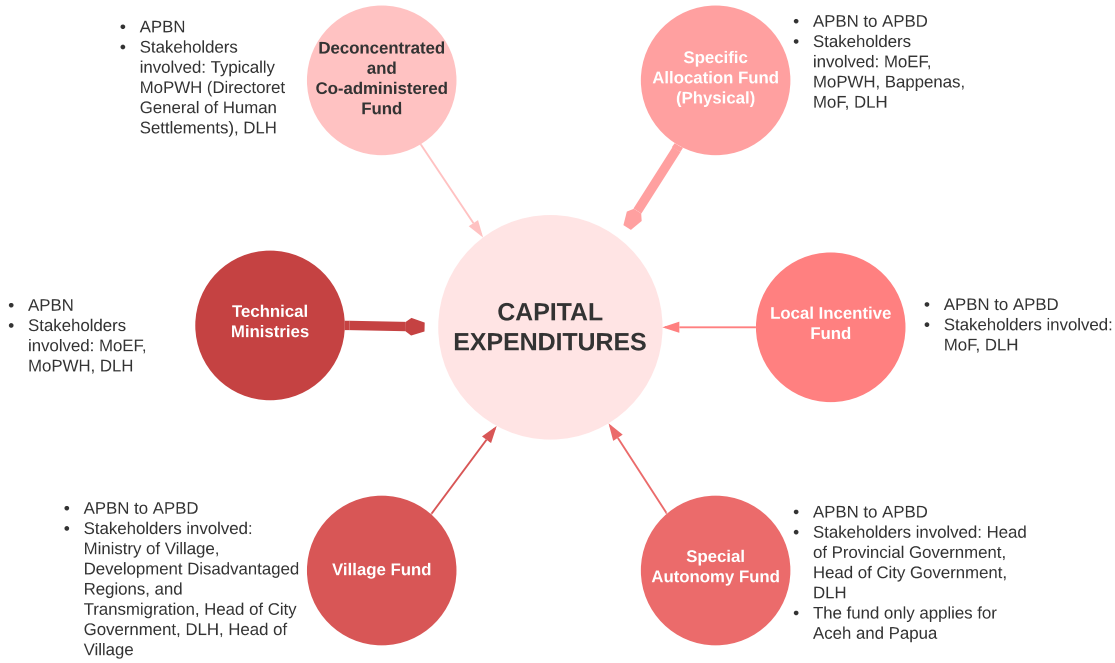


Figure 12 Funds mobilized for CAPEX

Source: Analysis (2020)

Table 16 Scheme of various financing sources in the waste sector

Financing Source	Definition and/or Scheme	Type of Support (Infrastructures and Facilites)	Remarks
Technical Ministries	• LG submits proposal to the ministries (readiness criteria should be fulfilled) → verification by technical ministries → disbursement (State Treasury Office/KPPN) and procurement (National Public Procurement Agency/LKPP) → construction (ministries) → asset transfer → Audit (Supreme Audit Institution of Indonesia/BPK)	• MoEF: Recycling Centre (PDU) of 5, 10 & 20 tons/day, Central Waste Bank, Composting House & Urban Farming, Biodigester, local treatment facility (TOS), Treatment facility for specific waste, other waste treatment facilities, crushing machines, pressing machines, siever, weighing scale, segregated bins, three-wheeler, waste transportation boat, other supporting equipment. • MoPWH: TPST, TPS3R, Landfill and Heavy equipment, etc.	• Included in APBN (line ministry budget document/DIPA K/L) • Technical guideline (MoEF): DG's regulation P.1/PSLB3/SET/KUM.1/5/2018 • Proposal submitted as early as possible
Deconcentrated and Co-administered Funds	• Deconcentrated Funds: Fund originating from the state budget (APBN) mobilized by the Governor as a representative of the government to implement ceconcentration, excluding vertical funds allocated to the regions. • Co-Administration Funds: funds originating from the state budget (APBN) that is mobilized by regions and villages in implementing co-administration. • Funds channeled as grants to the regions through the Directorate General of Human Settlements at MoPWH	Contruction of landfills, TPS, TPS3R	• Included in APBN (line ministry budget document/DIPA K/L)
Specific Allocation Funds (DAK)	• Funds allocated in the national budget to the regions, aimed to fund specific local affairs activities and allign with national priorities, both physical and non-physical • LGs submit on-line proposal (Krisna system) → verification and assess feasibility (technical ministries, Bappenas, Ministry of Finance) → Results will be synchronized with the resource envelope of DAK in RAPBN → included in APBD → All public budget approved → contruction (LG) → Audit (Supreme Audit Institution of Indonesia/BPK)	• MoEF: Waste Bank Unit, Composting House, collection and transport vehicles (Dump Truck, Arm-roll Truck) and Incentive Tipping Fee for waste-to-energy facilities in 12 cities (DAK Non-Physical) • MoPWH: TPS3R (incl. collection to TPS 3R)	• Included in APBN under Trasfer to Regions & Village Funds • Included in APBD under Annual Work & Budget Plan of local government working unit (RKA SKPD) • Proposal submitted as early as possible (ca. 2 years in advance) • Local governments must provide matching funds (min. 10% of the funds received) intended for physical construction • MoEF: Ministerial Regulation No. PP.104/MENLHK/SETJEN/KUM.1/12/2018:Opera

Financing Source	Definition and/or Scheme	Type of Support (Infrastructures and Facilites)	Remarks
			tional Guideline on DAK • Ministerial Regulation 33/PRT/M/2016: Technical Guideline on DAK
Local Incentive Funds (DID)	• Part of Transfer to Regions & Village Funds (TKDD) funds sourced from the national budget to some LGs based on certain categories of criteria with the aim of providing incentives towards the improved performance (achievement) in the areas of local financial governance, public service, basic services, and public welfare. • Ministry of Finance determines the cities' eligibility to receive the funds, based on main criteria (valuation of BPK, no delay in issuing the Local Regulation on Local Budget, implementation of e-government, one-stop integrated service) and performace category (incl. waste management performance)	The funds should be prioritized to finance activities that support the improved performance (achievement). In case financing of these activities have been secured, the funds can be used to finance activities for sector outside DID group category	• Included in APBD and APBN under Transfer to Regions & Village Funds • The channeling of funds distribute into 2 stages after the LGs submit some requirements (Local regulation on local budget of the current year, plans of the use of funds, realisation report of DID)
Special Autonomy Funds	• Funds allocated to finance the special autonomy of a region (The fund only applies to Aceh and Papua Province) • The funds set to be equivalent to 2% (two percent) of the national General Transfers (DAU) resource envelope • City/regency submits proposal to province	Collection/transport vehicle	• Included in APBN under Transfer to Regions & Village Funds • Included in APBD Province • The channeling of funds distributed into 3 stages after the LGs submit some requirements
Village Funds	• Funds originating from state budget (APBN and intended for villages to finance the development, governance, community development and empowerment • The funds are chanelled through the local budget (APBD), and are then further channelled by the LG to local villages based on specific formula by considering certain criteria, such as village population, poverty rate, level of geographical difficulty, and the like	Segregated bins, temporary collection points, waste cart, transport vehicle, treatment facility (composting, crushing machine), Waste Bank	• Ministerial Regulation: PermenDES 11/2019 on Prioritization of Village Funds FY 2020 • Included in APBD and APBN under Transfer to Regions & Village Funds

Source: Analysis (2020)

4.5 Financing Support from Development Partners in the Waste Sector

In Indonesia, any project proposals from ministries/agencies, local governments and State-Owned Enterprises (SOEs) with external funding, including those initiated by development partners, should be listed in an annual document of external loan and grant projects that is coordinated by Bappenas. Prior to listing such in the annual document, the project proposals should be listed in the five-year plan document for external loans, widely known as the Blue Book, which is in line with the duration of mid-term development plan (RPJMN). This goes particularly for loan projects.

External-loan planning documents are issued during the planning process, inter alia, the five-year planning document (Blue Book) and the annual planning document (Green Book). Whilst the Blue Book contains long-listed programs and project proposals to be funded by external loans, the Green Book contains the short-listed ones, merely those meeting most of the required readiness criteria and having an indicative funding source thus ready to be negotiated within the yearly effective period. In addition to that, the readiness criteria are set as a minimum threshold applied in order to minimize obstacles that may occur during project implementation, as well as to increase efficiency of external loans utilization.

Similarly to that, grants projects should also be listed in an annual planning document called List of Planned Grant Projects. This document contains project proposals which are eligible to be funded by grants, namely those considered to have fulfilled the readiness criteria required, as well as those already having funding indications from possible donors.

Based on the Blue Book (2015-2019) as well as recent updated Green Book and the List of Planned Grant Projects (2019), there are only two development partners currently listed with projects in the waste sector. These are the World Bank and the German Financial Development Cooperation (KfW), which both provide loans channeled through the technical ministry. Once assessments of the financial management system have been carried out and ensured to satisfy the donors' minimum requirements, the implementation arrangement of these projects are following the government system.

Other project proposals initiated by development partners in the waste sector, which are currently not listed in these official documents, may still be in the initial development phase (project design) or scoping study phase internally, such as USAID.

Development partners play an important role in the waste sector, especially in supporting the provision of waste management infrastructure and facilities, capacity development, as well as community participation. Each development partner has their specific fashion and goals tailored to the need of the Indonesian Government in the waste sector.

Currently, the World Bank is supporting the Government of Indonesia in improving the solid waste management services for urban populations in selected cities across the country through a $100 million loan to the government. The Improvement of Solid Waste Management to Support Regional and Metropolitan Cities Project is providing support in developing the sector policy, legislation, and financial sustainability with an emphasis on improving the operational financing of local governments, and inclusive collaboration of all stakeholders involved in all aspects of the sector starting from waste generation, collection, treatment, until disposal.

In principle, this project is designed to support the implementation of government programs in the waste sector and intends to strengthen the outcomes of existing government funding in solid waste management. Based on past experiences in dealing with asset transfer issues from central government to local government, a specific Task Force team (Steering Committee, Project Management, and Implementation Unit) have been established to implement the project that consists of representatives from involved ministries and local governments as well as a Working Group to ensure smooth project execution and accountability.

The total project cost of $326 million consists of, not only the World Bank funding ($100 Million) but also the government funding ($226 Million). All loan funds are executed under the state budget (APBN), which is included in the line ministry budget of the Ministry of Home Affairs and the Ministry of Public Work and Housing. Activities at the local level are executed by the Ministry of Public Work and Housing work units in the provinces (MPWH Provincial Satker). In general, the project implementation arrangement follows the government system, including budgeting, internal control, accounting and reporting, flow of funds and auditing mechanisms.

Based on the Project Appraisal Document of the World Bank Solid Waste Project (2019), the financial implementation arrangement for the project, which will be executed by following the government system, is as follows:

a. Budgeting: The World Bank financing will be included in the annual state budget (APBN) and line ministry budget document (DIPA K/L). As some parts of the project component will be covered through government funding, technical assistance will be provided to ensure smooth budget processing. Parallel budgeting will be made for contracts financed by loans and by the government (APBN and APBD). The budgeting system is able to ensure that double charging will not occur on the loan and the borrower's own resources.
b. Accounting and Reporting: The CPMU, CPIUs and PIUs offices maintain separate accounting records for all payment orders (SPM) and remittance orders (SP2D) on a cash basis following government accounting standards (Ministry of Finance Regulation no. 224/PMK.05/2016). All financial transactions are recorded in the government accounting system and included in government

accountability reports. The original records are maintained in the file for auditing purposes.

c. Internal Control: The payment verification process relies on government systems. Direct and independent documentary evidence is furnished to the implementing agencies for them to verify completion before payments are released to third parties.
d. Fund Flow: Designated Account (DA) denominated in US dollars is opened by the Directorate General of Treasury (MoF) in the Bank Indonesia (Central Bank) specifically for the project. Access to funds in the DA for payment to third parties or for on-granting transfers to the local government's treasury account follows the government's treasury system.
e. Disbursement Arrangements: The applicable disbursement methods are Advance and Reimbursement. A Designated Account (DA) denominated in US dollars is opened in Bank Indonesia (central bank) under the name of the Ministry of Finance. The DA is a segregated account solely used to finance eligible project expenditures. Payments from the DA follow the government mechanism and is authorized by the MoF's treasury office. The ceiling of the advance to DA is variable based on six months projected expenditures. Report on the use of the DA fund and request for additional advance will be based on the quarterly Interim Financial Reports. The proceeds of the loan are disbursed against eligible expenditures.
f. Audit Arrangements: The project is subject to an external audit by the BPK as the Supreme Audit Institution of Indonesia. Each audit will cover a period of one fiscal year of the recipient. The audit goes beyond merely providing an opinion on the financial statements but also includes opinions on internal control frameworks and compliance with the loan covenants and related regulations.

It should be noted that the World Bank project is expected to involve cross-sectoral and partially centralized/decentralized implementation by multiple agencies with different levels of procurement capacity. All procurement under the World Bank-financed part of the Project will be carried out under the World Bank's Procurement Framework. As for the procurement that is not financed by the loan but exclusively from the government's own budget may follow the government's procurement regulations.

The World Bank support in particular has been designed and acknowledged by the counterpart as the national platform for the waste sector involving cross-sector participation of many stakeholders. Based on a discussion with the representative of the German Financial Development Cooperation Bank (KfW) in Indonesia, the next phase of KfW support, which is currently under preparation, will be closely coordinated and integrated with the national framework.

KfW is currently supporting the Government of Indonesia in its efforts to reduce greenhouse gas emissions from improper waste disposal, where most cities in Indonesia still apply the non-sanitary system. Through its Emission Reduction in Cities program (ERiC), the KfW is financing the on-going construction of sanitary landfills in selected cities, while in parallel also preparing the second part of an ERiC program to be officially listed in an annual document of external loan coordinated by Bappenas. Apparently, one of the five candidate cities that participated in the SSC, which is the city of Banda Aceh, has also been listed as one of the candidate cities to take part in ERiC-2 where advanced technology will be introduced. The first part of the ERiC is co-financed by the Government of Germany, through KFW, and the Government of Switzerland, through Switzerland State Secretariat for Economic Affairs (SECO). The KfW provides EUR 75.0 million of loans to the Government of Indonesia for the provision of waste management infrastructure and facilities. Meanwhile, SECO grants EUR 8.0 million to the ERiC project for the provision of capacity building (accompanying measures) that will ensure the sustainability of the solid waste facilities. The local governments provide an in-kind and/or cash contribution to the project, particularly land acquisition. However, based on KfW experience, it is worth noting that during implementation, especially when the local government has proposed a budget allocated for land acquisition in the budget implementation document of the local agency, there are still a number of possible obstacles arises, such as not getting approved by the Local Parliament or the amount budgeted is not as previously agreed due to many reasons, such as limited land availability or increasing prices. Some of the lessons learned from the KfW project that was highlighted during this study include the challenges in synchronizing the funding, specifically from the local government side in the budgeting phase, as well as in in strategizing the proposed financing instrument between loan and grants in accordance with the project activity/phase, in order to ensure the best outcomes to be achieved.

5. Conclusions and Further Recommendations

5.1 Conclusions

In Indonesia, the primary responsibility of ensuring adequate service for waste management lies at the local municipalities as stipulated in the Regional Government Act 23/2014. Consequently, the current practices and arrangements of waste management are mainly based on a public model combined with community-based participation in primary collection both in terms of financing and service delivery. However, present levels of waste management services, with 67% of waste handled nationally, are not sufficient to handle properly the increasing amounts of waste and to reduce the waste leakage to the environment and the sea. Moreover, the current practice, which focuses on providing basic services (collection to final disposal), would need comprehensive improvements gradually. The basic understanding and approach of waste management also needs to be changed so that waste is seen and treated as a resource and effectively utilised based on circular economy principles. Developing comprehensive and integrated approaches to waste management that include all related aspects (financing, policy and regulatory, technical, institutional, etc), are crucial for developing effective and sustainable waste and resource management services in Indonesia. Some initiatives have already been initiated to start working in this direction.

With regards to waste sector financing, public funds are still the main source of funding for the sector with some portion of the APBN earmarked to the financing of capital expenditures, while APBD is allocated for operational expenditures. Support in providing investment capital for waste management by the central government (APBN) has been deployed in various forms through technical ministries (including from international funding), as well as fiscal transfers such as the Specific Allocation Fund, Local Incentive Fund, Special Autonomy Fund and Village Fund. Based on discussions, the most common types of funds mobilized to provide capital investments are coming from the technical ministries and the Specific Allocation Fund.

The central government provides various types of capital investment funding, however, the budget allocated by the local government to operate these infrastructural services and facilities are often insufficient. Insufficient budgets and lack of revenue generation to cover operational costs is one of the main challenges for the waste sector in Indonesia. The findings of this study clearly shows a low percentage of financial allocations for waste budgets in the five cities ranging from only 0.3% to 2.18% of the total local budget (APBD). These figures range well below the average allocation budget in other lower-middle-income countries (3% to 10% according to Wilson et al.) and not even reaching half of the required budget to provide adequate waste services, which should be approximately 5% or more, as suggested by the World Bank. According to Wilson et al. (2012), regardless of any access to grants and loans for capital investments from the central government or international financing agencies,

if the city cannot cover at least the costs of day-to-day operations from their own allocated budget, the system and its services will remain unsustainable.

Many factors influence the low percentage of operational budget allocated by the local governments, including among others: i) local priority agenda; ii) service coverage area; iii) level of retribution tariff; and iv) retribution revenue. Each factor might also be influenced by other causes as well. For instance, Malang Regency faces difficulties in improving the service level, even within the covered area, due to limited infrastructure and facilities, and subsequently hinders the expansion of services to new uncovered areas. The uncovered areas usually have more challenging geographical conditions and distances, which also require specific collection or transport vehicles or equipment, and thus of course equally additional financial resources. The revenue generated from the waste retribution therefore remains low, equivalent to the operational budget allocated in APBD. This is the case particularly when the budget allocation is determined based on how much the revenue collected contributes to the local own-source revenue, although this is not always the case, especially if the waste sector is included in the local priority agenda. The portion of waste handled in Malang Regency remains low, only around 35.5% to 41.64% of the total waste generated. In order to break this vicious cycle, incremental improvements that touch each aspect comprehensively would be needed.

It is important to note that sufficient budgets do not necessarily guarantee high performance of the waste sector and its service providers. Institutional and technical capacity challenges also have to be addressed in a structured and systematic manner to achieve overall sector performance improvements. As revealed by the World Bank (2019), due to the severe deficit in infrastructure investments and lack of technical capacity, sector outcomes are almost always lacking even when the municipality is allocating sufficient operational budgets to waste management systems and services. In the case of Depok City, the budget allocation for the Environmental Agency (budget not specific to finance waste management purposes) is ranked within the top 5 among 23 existing local government working units, which usually indicates high local priority. However, although the city as a coverage area of 60%, it still has the highest percentage of uncollected waste, which is estimated to be 39% of the total waste generation. This is compared to the estimated current national average of unhandled waste at 33%, as mentioned in the RPJMN 2020-2024. Moreover, the contribution of waste retribution revenue in Depok City only covers 5.27% of the waste management budget, which is the lowest among the five cities. This also clearly shows that the budget relies heavily on subsidies and is affected by poor operational performance, either in providing the services or in collecting the revenue. Furthermore, this situation might also indicate the lack of technical capacity as well as inadequate infrastructure locally.

This study concludes that two main challenges need to be addressed when it comes to financing of the waste sector in Indonesia, namely: i) the level of funding, whether it is from public revenue or user-payment schemes, and in

particular for operational but also for capital investments, need to be increased in the coming years; and ii) the accountability and effectiveness of fund utlilisation in waste management services needs to be improved, in which its effectiveness mainly correlates with other aspects, such as institutional and technical capacity, regulatory framework and enforcement, community awareness and participation, coordination and collaboration among stakeholders, etc

5.2 Further Recommendations

1. Currently, efforts for improvements of the waste sector are underway, particularly at the national level, but the national policy-making needs to be translated into actual implementation at provincial and municipal levels. Based on the main findings of this study, the following recommendations for the national and local authorities are made for working towards more effective and efficient waste management services in Indonesia: Increasing national funding through national and local public budgets and user-payment schemes, in particular for recovery of operational costs, but also for capital investments for new waste resource projects.

   Today, funds allocated for the waste management sector is highly insufficient, especially for daily operation and maintenance of waste services. This is despite some efforts from the government to address this urgent issue. At the national level, the central government is currently re-structuring the waste retribution tariff based on a recently developed standard unit cost of the full system of waste management services. The guideline of standard unit costs of waste management will provide the basis for revision of tariffs and collection schemes making the systems more transparent and administratively effective. The guideline that is being developed is expected to serve as the legal basis for local governments when proposing local budget allocations for waste management services.

   In order to further encourage the implementation at the local level, this guideline will be stipulated under a Ministerial Regulation of the Ministry of Home Affairs. This is a collaborative effort among related ministries involved in the waste sector, in which the Directorate of Environment of Bappenas has been actively participated in the coordination of this effort. Further discussion with Bappenas (Directorate of Environment) is recommended in order to identify any comprehensive support needed as well as to better understand the concept and the progress of this important work.

   Another plan at the national level to improve the availability of funds is related to strengthening the institutional capacity of institutions involved in waste management. As part of the national framework for the waste

sector supported by the World Bank, the central government foresees other alternatives to strengthen waste management institutions and financial sustainability, such as through institutional reforms or involvement of the Public Service Agency (BLUD).

The Ministerial Regulation of Home Affairs on Public Service Agency (BLUD) 79/2018 defines BLUD as a system implemented by the technical implementing units of local agencies in providing services to the public with flexibility in terms of financial management. In principle, BLUD aims to provide general services in a more effective, efficient, transparent and accountable manner with the principles of equality, propriety and benefits in line with sound business practices. This institutional form is considered a semi-commercial form of the local government entity that reports directly to the regional government head (province, city or district). BLUD has its own business plan and is output-oriented. Moreover, BLUD has a variety of revenue sources including service fees, grants, APBD, revenue from cooperation with third parties and other revenues. Financially, BLUD is also allowed to have separate financial accounts, keep year-end cash balances for own use as well as to recruit the private sector providers. It is recommended to further discuss this initiative with the World Bank and national partners to better understand the concept, plans and other details of the initiative. An in-depth study of BLUD is also suggested before engaging this concept further with the local governments.

At the city level, Depok City is currently at the very early stage of looking into an interesting model of combining the collection of waste retribution with the water utility bills. It is suggested to have an initial discussion with the Environmental Agency of Depok City to better understand their plan and progress.

Adjustment of the retribution tariff at least once every third year, as mandated in the Act 28/2009, should also be further encouraged in each of the cities and their environmental agencies. It is important to gradually improve the correlation between the cost levels and revenue to achieve a much better cost recovery, and at best full cost recovery.

Updates of the tariffs and improvement of the revenue collection schemes should go hand in hand with developing more effective separation and collection systems.

2. Improving effectiveness of fund and resource utilisation

The main key to improving the effectiveness of the funds allocated to the waste sector is to build greater capacity in all related aspects of the waste sector in a comprehensive, systematic and structured manner. This effort should be made at each level of government in accordance with individual and specific responsibilities.

Support to capacity building at the national level should be focused on building greater capacity in developing a realistic policy and regulatory framework, integrated planning and system development, strong monitoring and evaluation, as well as greater institutional capacity for better coordination and collaboration, both vertically and laterally, among related public and private stakeholders. As the waste sector in Indonesia is a cross-sectoral affair that involves several ministries, such support should be adapted to the mandate and responsibility area of each of the relevant ministries.

At the local level, support to capacity building should be prioritized for the service provider, particularly to the city's environmental agency (DLH) or through facilitation by the technical ministries. At this stage, capacity building support should focus on technical improvements in providing the services (technical implementation) as well as to build greater governance capacity, including improvement of the accountability of local waste management institutions (DLH). For financing, budgeting and accounting, this includes in particular improvements of transparency and traceability of the source and the use of funds to finance the waste management system. Additionally, building capacity to handle, oversee and operate the waste accounting system is also crucial, as this will be required for ensuring better local regulation, monitoring and enforcement. All these efforts will contribute to improving the effectiveness of the fund ultilisation, which should also be monitored through simple performance indicators, such as a percentage of waste collection, coverage area, retribution and fee collection rates etc.

Support to enhancing the financing of the waste sector and its effectiveness can also be optimized by working in close coordination with the national platform of waste management. This effort is recommended as many challenges are of a political, institutional and cross-cutting nature involving many different stakeholders, not least when it comes to reforming and introducing new tariffs and financial accounting systems.

It is expected that collaborative efforts can be coordinated and integrated under the national platform that channel substantive support from various sources to improve the waste management sector. Such efforts might also contribute to addressing gaps more effectively and efficiently in order to ensure that the best outcomes are achieved.

One of the focus areas of the SSC between Denmark and Indonesia is to contribute to creating better framework conditions for sector development and private sector involvement, which in accord with one of the national platform's components. It is recommended to coordinate closely with the Steering Committee of the national platform, which is chaired by Bappenas (Directorate of Urban, Settlement, and Housing as

well as Directorate of Environment), in parallel with a coordination with the World Bank.

Annex 1 Basic Data and Information on 5 Cities

No	Parameter	Malang Regency	Depok City	Jambi City	Bukittinggi City	Banda Aceh City	Remarks
A. Basic Information							
1	Population	2,576,596	2,179,813	591,340	126,804	254,904	
2	Category	Metropolitan City	Metropolitan City	Big City	Medium City	Medium City	
3	% Population in Rural Areas	52.3	0	3	0	0	
4	% Population in Urban Areas	47.7	100	97	100	100	
5	Growth rate %	0.88	4.29	2.71	2.29	3.28	
6	Total Area (km2)	3534	200	205	25	61	
7	Population Density (inhabitant/km2)	870	11635	3464	5024	4236	
B. Waste Data							
1	Waste Generation (t/d):	1004.86	1320	461.25	154.42	210	Data obatined from SIPSN website, which represents the data reported by the city to the ministry. Some figures, esp. % Waste treatment claimed in some cities, were likely overestimated. Bukittinggi overestimating the waste generation due to the counting of waste from other cities that ended up in this city
2	Reduction at Source %:	7.88	5	0.11	3.59	0.24	
3	Waste Treatment %:	8.56	11	3.32	31.43	13.14	
4	Final Disposal %:	25.20	45	60.67	64.97	86.13	
5	Unidentified %:	58.36	39	35.90	0.01	0.49	
6	Total %:	100	100	100	100	100	
C. Waste Financing Data							
1	Total Local Budget (APBD):						Financing Data shown from various fiscal year. Data series used: Malang Regency, Banda Aceh & Bukittinggi FY: 2015-2018; Jambi FY: 2010 - 2013, Depok only shows the Budget of Local Environmental Agency (DLH) FY: 2012 – 2015.
	Fiscal Year – 1, IDR	3,439,632,063,349	1,854,609,000,000	662,897,000,000	593,323,296,014	1,217,410,000,000	
	Fiscal Year - 2, IDR	3,448,452,000,000	1,817,101,000,000	814,323,000,000	647,045,711,856	1,248,393,000,000	
	Fiscal Year - 3, IDR	3,919,236,000,000	2,097,915,000,000	952,960,000,000	710,039,112,989	1,213,750,000,000	
	Fiscal Year - 4, IDR	3,719,088,768,104	2,178,595,019,630	1,164,032,249,296	783,824,996,740	1,135,914,599,521	
2	Waste Management Budget:						
	Fiscal Year - 1, IDR	9,998,928,144	44,529,000,000	4,518,728,750	3,823,425,000	20,931,420,825	
	Fiscal Year - 2, IDR	9,736,257,339	77,915,000,000	11,301,172,251	4,042,528,000	27,988,530,756	
	Fiscal Year - 3, IDR	11,048,215,000	106,868,000,000	19,301,947,500	4,961,330,680	27,327,640,608	
	Fiscal Year - 4, IDR	13,107,469,000	161,941,056,440	11,953,374,800	4,223,178,620	28,454,306,850	
3	**AVERAGE BUDGET ALLOCATION %**	**0.30%**	**6.81%** (Not Waste Budget – DLH's Budget)	**1.31%**	**0.61%**	**2.18**	Average estimated from varies of number of data series, not only from 4 Fiscal Year

Source: MoEF (SIPSN website) and MoF (2019), Central Bureau of Statistics (2017-2019), Analysis (2020), Environmental Agency of Malang Regency (2019), Environmental Agency of Banda Aceh (2020), Environmental Agency of Bukittinggi (2020), Study of National Waste Management Policy and Strategy by Coordinating Ministry of Economic Affairs (2015), Report of Waste-to-Energy Baseline Survey, UN ESCAP (2015)

Annex 2 Waste Data on 5 Cities

No	City	Fiscal Year	Unit	Total Waste Generation	Coverage Area %	Reduction at Source	Waste Treatment						Final Disposal	Unidentified	Total
						Waste Bank	Composting	Recycling (RM)	Waste to Fuel	Biogas	Recycling (CP)	Others			
1	Malang Regency	2014	t/d	1279	N/A	16.98	23.64	62.81	0.85	0	0	0.74	361.86	812.12	1279
		2015	t/d	0	0	0	0	0	0	0	0	0	0	0	0
		2016	t/d	0	0	0	0	0	0	0	0	0	0	0	0
		2017	t/d	1004.86	60	79.18	0	64.57	1.21	0	4.58	15.63	253.23	586.46	1004.86
		Mass Balance	%			7.88	0.00	6.43	0.12	0.00	0.46	1.56	25.20	58.36	100.00
2	Depok City	2014	t/d	1200	43	5	60	10	0	0	0.1	0	500	624.9	1200
		2015	t/d	0	0	0	0	0	0	0	0	0	0	0	0
		2016	t/d	1286	46.66	45	90	10	0	0	1	0	600	540	1286
		2017	t/d	1320	59.83	62	130	10	0	0	0	0	600	518	1320
		Mass Balance	%			5	10	1	0	0	0	0	45	39	100
3	Jambi City	2014	t/d	362.5	100	0	0	0	0	0	0	0	262.5	100	362.5
		2015	t/d	0	0	0	0	0	0	0	0	0	0	0	0
		2016	t/d	0	0	0	0	0	0	0	0	0	0	0	0
		2017	t/d	461.25	100	0.5	7.4	7.9	0	0	0	0	279.84	165.61	461.25
		Mass Balance	%			0.11	1.60	1.71	0	0	0	0	60.67	35.90	100.00
4	Bukittinggi City	2014	t/d	0	0	0	0	0	0	0	0	0	0	0	0
		2015	t/d	180.73	90	5	2.4	46	0	0	5	0.007	122.28	0.043	180.73
		2016	t/d	181	90	5	11	49	0	0	6	0	110	0	181
		2017	t/d	154.42	90	5.55	12.20	30.78	0	0	5.55	0	100.33	0.01	154.42
		Mass Balance	%			3.59	7.90	19.93	0	0	3.59	0	64.97	0.01	100.00
5	Banda Aceh City	2014	t/d	187	N/A	0.5	5	22.1	0	0	0	0	154.4	5	187
		2015	t/d	187.12	87.78	0.5	5.05	22.15	0	0.3	0.1	0	158	1.02	187.12
		2016	t/d	200.24	88	0.6	6.9	25.1	0	0.35	0.1	0.15	165	2.04	200.24
		2017	t/d	210	90	0.5	5.05	22.15	0	0.3	0.1	0	180.88	1.02	210
		Mass Balance	%			0.24	2.40	10.55	0.00	0.14	0.05	0.00	86.13	0.49	100.00

Source: SIPSN, MoEF (2018)

Annex 3 Waste Retribution Tariff

Local Regulation of Depok City 5/2019 (Amendment to Local Regulation 5/2012) Regarding the Retribution of Waste Services

No	Category of Service	Tariff (IDR)
A	Transport, management and final disposal of:	
	1 Non-residentials and irregular housing settlement, based on building areas:	
	a) ≤ 100 m²	7,000/month
	b) 101 m² - 200 m²	15,000/month
	c) 201 m² - 300 m²	25,000/month
	d) > 300 m²	40,000/month
	2 Residentials and irregular housing settlement, based on building areas:	
	a) 21 m² - 100 m²	20,000/month
	b) 101 m² - 200 m²	25,000/month
	c) 201 m² - 200 m²	50,000/month
	d) > 300 m²	75,000/month
	3 Flats and Offices categories:	
	a) Flats/rented	10,000/unit/month
	b) Offices (Public and Private)	150,000/month
B	Industry/Factory/SMEs/Workshops/Carpentry/Medical Waste (non-hazardous), etc:	
	1 Industry/factory:	
	a) Industry/factory	250,000/m³
	b) SMEs	50,000/month
	2 Workshops/Dealers:	
	a) Car-workshops/dealers/non-dealers	250,000/month
	b) Motorcycle-Workshop/dealers/non-dealers	100,000/month
	c) Service workshop (SMEs)	50,000/month
	3 Carpentry/material processing:	
	a) High-scale	100,000/month
	b) Low-scale	50,000/month
	4 Hospitals, Clinics, Healthcare Centres, Pharmacies:	
	a) Type A Hospital	150,000/m³
	b) Type B & C Hospital	50,000/m³
	c) Other healthcare centres & pharmacies	100,000/month
C	Hotels/Inns/Training and Education Centres/Apartments/Restaurants/Shopping Centres/Shops/Banks/Cinemas/Wholesale market/Shopping malls/etc:	
	1) Commencials:	
	a) 3 and 4-star Hotels	100,000/m³
	b) 1, 2, 3-star Hotels and budget hotels	50,000/m³
	c) Education & Training Centre, Conference/Meeting Hall	100,000/m³
	d) Boarding Houses	5,000/room/month
	e) Apartments	50,000/room/month
	f) Restaurant and Café	50,000/m³
	g) Shops:	
	Shops	70,000/unit/month
	Shophouse	100,000/unit/month
	h) Banks	200,000/m³
	i) Swimming Pools	100,000/m³

No	Category of Service	Tariff (IDR)
	j) Warehouse	50,000/m³
	2 Education/Academic Institutions:	
	a) Public and Private School, islamic boarding school	40,000/m³
	b) Public and Private Universities	100,000/m³
	c) Tutoring/Course	50,000/month
	3 Shopping Centre, modern stores & other commercial activities	
	a) Small, medium, big stores & wholesale market	100,000/m³
	b) Kiosk/stalls	20,000/month
	c) Non-permanent vendors	2,000/day
	d) Ornamental plant stall	20,000/month
D	Market, Bus and Train Station	
	a) Market managed by private	200,000/m³
	b) Type A Bus Station	250,000/m³
	c) Type B Bus Station	200,000/m³
	d) Type C Bus Station	150,000/m³
	e) Train Station	200,000/m³
F	Temporary collection sites/containers serving boarding house, restaurant, hotels/apartments, factory/industry, hospital/clinics/maternity clinics	750,000/month

Local Regulation of Malang Regency 7/2018 (The 4th Amendment to Local Regulation 10/2010) Regarding the Retribution of Public Services

No	Category of Service			Tariff (IDR)
1.	Residentials			
	a.	Households located in road villages		1,000/day
	b.	Households located in public roads, provinces, regencies		1,500/day
2.	Office Buildings			
	a.	Government		8,500/day
	b.	Non-Government		8,500/day
3.	Shops and Restaurants			
	a.	Shops		
		1)	High scale (Sales Value of Taxable Object > IDR 40 Million)	7,000/day
		2)	Mid scale (Sales Value of Taxable Object > IDR 20 - 40 Million)	5,000/day
		3)	Low scale (Sales Value of Taxable Object reach IDR 20 Million)	2,500/day
	b.	Restaurant		
		1)	High scale (Sales Value of Taxable Object > IDR 50 Million)	34,000/day
		2)	Mid scale (Sales Value of Taxable Object > IDR 25 - 40 Million)	17,000/day
		3)	Low scale (Sales Value of Taxable Object reach IDR 20 Million)	5,800/day
4.	Hotels, Inns, etc			
	a.	Hotel		
		1)	4-star Hotels	125,000/day
		2)	3-star Hotels	100,000/day
		3)	1-star Hotels	75,000/day
		4)	Budget Hotels	50,000/day
	b.	Hostelry		25,000/day
	c.	Bungalow and the like		20,000/day
5.	Market			
	a.	Class-1		
		1)	Stores, Kiosk/Shops located inside the market	2,500/day
		2)	Stalls located inside the market	2,000/day
		3)	Stalls located outside the market	2,500/day
		4)	Food stalls/restaurants	2,000/day
		5)	Permanent street vendors	1,000/day
		6)	Non-Permanent street vendors	1,500/day
	b.	Class-2		
		1)	Stores, Kiosk/Shops located inside the market	2,000/day
		2)	Stalls located inside the market	1,500/day
		3)	Stalls located outside the market	2,000/day
		4)	Food stalls/restaurants	1,500/day
		5)	Permanent street vendors	1,000/day
		6)	Non-Permanent street vendors	500/day
	c.	Class-3		
		1)	Stores, Kiosk/Shops located inside the market	1,500/day
		2)	Stalls located inside the market	1,000/day
		3)	Stalls located outside the market	1,500/day
		4)	Food stalls/restaurants	1,000/day
		5)	Permanent street vendors	1,000/day
		6)	Non-Permanent street vendors	500/day

No	Category of Service				Tariff (IDR)
6.	Theater/Cinemas/Public places				
	a.	Theater/Cinema			10,000/day
	b.	Billiards Pool			
		1)	Big Pool (> 5 Tables)		15,000/day
		2)	Small Pool (< 5 Tables)		10,000/day
	c.	Beauty parlor			5,000/day
	d.	Internet Café			3,000/day
	e.	Wellness centre			10,000/day
	f.	Food stalls/kiosk located at stations			5,000/day
7.	Hospitals, Maternity Clinics, Clinics, Maternal and Children Health Centres (Public and Private)				
	a.	Hospitals, Maternity Clinics, Clinics, Maternal and Children Health Centres			10,000/day
	b.	Pharmacies			5,000/day
8.	Businesses and/or Buildings				
	a.	Showroom, Car-workshop			
		1)	Big scale		20,000/day
		2)	Low scale		10,000/day
	b.	Motorcycle-workshop			
		1)	Big scale		10,000/day
		2)	Low scale		5,000/day
	c.	Warehouse			25,000/day
	d.	Car wash facilities			20,000/day
	e.	Service centres (electronic goods)			25,000/day
	f.	Garage and/or parking area for bus, truck, and adapted passanger			
		1)	Big scale		25,000/day
		2)	Low scale		15,000/day
	g.	Other garages			3,000/day
	h.	Gas station			20,000/day
	i.	village-owned cooperative			10,000/day
	j.	Flower shops			10,000/day
9.	Transport services (arm toll/dump truck)				
	a.	Tipping fee to final disposal (apart from the waste trasported by local authorities)			16,600/m^3
	b.	Businesses, residentials, hospitals, etc served by Dump Truck/containers			
		1)	Served by Arm Roll Truck (containers)		
			a)	Distance: 0 - 10 km from point of source to landfill (Round trip)	149,000/trip
			b)	Distance: 10 - 20 km from point of source to landfill (Round trip)	154,000/trip
			c)	Distance: 20 - 40 km from point of source to landfill (Round trip)	180,000/trip
			d)	Distance: 40 - 60 km from point of source to landfill (Round trip)	195,000/trip
			e)	Distance: > 60 km from point of source to landfill (Round trip)	216,000/trip
		2)	Served by Dump Truck		
			a)	Distance: 0 - 10 km from point of source to landfill (Round trip)	170,000/trip
			b)	Distance: 10 - 20 km from point of source to landfill (Round trip)	178,000/trip
			c)	Distance: 20 - 40 km from point of source to landfill (Round trip)	196,000/trip
			d)	Distance: 40 - 60 km from point of source to landfill (Round trip)	215,000/trip
			e)	Distance: > 60 km from point of source to landfill (Round trip)	231,000/trip

Local Regulation of Banda Aceh City 5/2017 Regarding The Retribution of Waste Services

No	Retribution Object (Category)	Buildings Area/Unit	Tariff (IDR)	
			Main Streets & City Centre	Regular & Village Streets
1.	Housing and Settlements	> 150 m²	20,000	
		36 - 150 m²	15,000	
		< 36 m²	10,000	
2.	Shophouse	> 64 m²	25,000	20,000
		48 - 64 m²	20,000	15,000
		< 48 m²	15,000	10,000
3.	Shops	> 64 m²	40,000	30,000
		48 - 64 m²	30,000	25,000
		< 48 m²	25,000	20,000
4.	Workshop/Showroom/Printing	> 100 m²	100,000	
		48 - 100 m²	75,000	
		< 48 m²	50,000	
5.	Wholesale market	> 64 m²	50,000	
		48 - 64 m²	40,000	
		< 48 m²	30,000	
6.	Supermarket and Shopping Centre/Modern Retails	> 1,000 m²	600,000	
		500 - 1,000 m²	500,000	
		150 - 500 m²	350,000	
		80 - 150 m²	250,000	
		< 80 m²	200,000	
7.	Offices (Public, Private, State-owned enterprises)	> 1,000 m²	200,000	
		500 - 1,000 m²	150,000	
		100 - 500 m²	100,000	
		< 100 m²	75,000	
8.	Restaurant/Café	> 200 m²	80,000	
		100 - 200 m²	60,000	
		65 - 100 m²	45,000	
		48 - 64 m²	35,000	
		< 48 m²	30,000	
9.	Canteen	per Location	15,000	
10.	Street vendors, kiosk	per Area	15,000	
11.	Merchant located inside market	per Table	15,000	
12.	Barbershop/Wellness Centre/Beauty Parlor/etc	> 64 m²	50,000	35,000
		48 - 64 m²	35,000	25,500
		24 - 48 m²	30,000	20,000
		< 24 m²	20,000	15,000
13.	Game Center/Internet Cafe/mobile electronics stores	> 64 m²	40,000	30,000
		48 - 64 m²	30,000	25,000
		< 48 m²	25,000	20,000
14.	Playground/Funland/Waterboom	> 250 m²	100,000	
		100 - 250 m²	75,000	
		< 100 m²	60,000	
15.	Sport/Fitness Center	> 100 m²	50,000	
		48 - 100 m²	40,000	
		< 48 m²	30,000	
16.	Business Enterprises, Notary Public	> 64 m²	50,000	
		48 - 64 m²	40,000	
		< 48 m²	30,000	
17.	Plant merchants	> 100 m²	35,000	
		48 - 100 m²	30,000	
		< 48 m²	25,000	

No	Retribution Object (Category)	Buildings Area/Unit	Tariff (IDR)	
			Main Streets & City Centre	Regular & Village Streets
18.	Hotels/Inns	5-star	800,000	
		4-star	650,000	
		3-star	450,000	
		2-star	350,000	
		1-star	300,000	
		Budget Hotel	250,000	
		Inn	150,000	
		Boarding house	100,000	
19.	Hospitals	Type A	900,000	
		Type B	700,000	
		Type C	500,000	
		Type D	400,000	
20.	Clinics/Healthcare Centre/etc	> 1,000 m²	350,000	
		500 - 1,000 m²	250,000	
		100 - 500 m²	200,000	
		< 100 m²	150,000	
21.	Pharmacy	> 64 m²	50,000	
		48 - 64 m²	40,000	
		< 48 m²	25,000	
22.	School	> 1,000 Students	250,000	
		500 - 1,000 Students	200,000	
		200 - 500 Students	150,000	
		100 - 200 Students	75,000	
		< 100 Students	40,000	
23.	Education and Training Centre	> 64 m²	35,000	20,000
		48 - 64 m²	25,000	15,000
		< 48 m²	20,000	10,000
24.	University	> 1,000 m²	350,000	
		500 - 1,000 m²	250,000	
		< 500 m²	200,000	
25	Food and catering business, etc	> 64 m²	30,000	
		48 - 64 m²	25,000	
		< 48 m²	20,000	
26.	Second hand merchant	> 100 m²	30,000	
		65 - 100 m²	25,000	
		48 - 64 m²	20,000	
		< 48 m²	15,000	
27.	Gas Station	1 location	200,000	
28.	Furnitures	> 200 m²	40,000	
		100 - 200 m²	30,000	
		< 100 m²	25,000	
29.	Gudang/Pool Kendaraan/Terminal	> 1,000 m²	250,000	
		500 - 1,000 m²	150,000	
		< 500 m²	100,000	
30.	Parking lot	> 200 m²	70,000	
		100 - 200 m²	45,000	
		< 100 m²	35,000	
31.	Waste transported to landfill (self-service/not served by local authority)	50/Kg		

Local Regulation of Bukittinggi City 5/2014 Regarding The Retribution of Waste Services

No	Category of Service	Tariff (IDR)
1	Household and Settlement	
	a. Households served with direct services	5,000/month
	b. Households not served with direct services	4,000/month
	c. Boarding house	
	i per household	3,000/month
	ii per unit	3,000/month
2	Restaurant/Café/Food stalls	
	a. Restaurant	
	i Class-1	200,000/month
	ii Class-2	100,000/month
	iii Class-3	50,000/month
	b. Food Stalls	
	i Class-1	30,000/month
	ii Class-2	20,000/month
	iii Class-3	10,000/month
3	Industries and Hotels	
	a. Home industries	5,000/month
	b. Small-scale industries	10,000/month
	c. Medium-scale industries	20,000/month
	d. Budget Hotels	50,000/month
	e. 1-star Hotels	85,000/month
	f. 2-star Hotels	100,000/month
	g. 3-star Hotels	150,000/month
	h. 4-star Hotels	200,000/month
4	Trading and services	
	a. Grocery/kiosk	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month
	Large-sized, waste volume: (0.75 m^2/day)	26,500/month
	b. Electronics shop	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month
	Large-sized, waste volume: (0.75 m^2/day)	26,500/month
	c. Household furniture	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month
	Large-sized, waste volume: (0.75 m^2/day)	26,500/month
	d. Glassware/Tableware	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month
	Large-sized, waste volume: (0.75 m^2/day)	26,500/month
	e. Building materials/vehicle equipments	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month
	Large-sized, waste volume: (0.75 m^2/day)	26,500/month
	f. Barbershop/Beauty Parlor	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month
	Large-sized, waste volume: (0.75 m^2/day)	26,500/month
	g. Jewelry stores	5,500/month
	h. Tailor	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month
	Large-sized, waste volume: (0.75 m^2/day)	26,500/month
	i. Textiles	
	Small-sized, waste volume: (0 - 0.50 m^2/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m^2/day)	8,500/month

No	Category of Service	Tariff (IDR)
	Large-sized, waste volume: (0.75 m²/day)	26,500/month
	j. Pharmacies etc	
	Small-sized, waste volume: (0 - 0.50 m²/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m²/day)	8,500/month
	Large-sized, waste volume: (0.75 m²/day)	26,500/month
	k. Shoes / Sandals, Watch Repair / Sewing Machines	
	Small-sized, waste volume: (0 - 0.50 m²/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m²/day)	8,500/month
	Large-sized, waste volume: (0.75 m²/day)	26,500/month
	l. Bookstore/Stationery	
	Small-sized, waste volume: (0 - 0.50 m²/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m²/day)	8,500/month
	Large-sized, waste volume: (0.75 m²/day)	26,500/month
	m. Antiques	
	Small-sized, waste volume: (0 - 0.50 m²/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m²/day)	8,500/month
	Large-sized, waste volume: (0.75 m²/day)	26,500/month
	n. Vegetables and Fruits Traders	
	Small-sized, waste volume: (0 - 0.50 m²/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m²/day)	8,500/month
	Large-sized, waste volume: (0.75 m²/day)	26,500/month
	o. Fish/Meat Traders	
	Small-sized, waste volume: (0 - 0.50 m²/day)	5,500/month
	Medium-sized, waste volume: (0.5 - 0.75 m²/day)	8,500/month
	Large-sized, waste volume: (0.75 m²/day)	26,500/month
5	Supermarket/mini-market/Department Stores	
	a. Supermarket/Department Stores	100,000/month
	b. Mini Market	50,000/month
6	Bus Station/Terminal	
	a. Large Inter-Province Bus	1,000/entry
	b. Medium Inter-Province Bus	500/entry
7	Healthcare Facilities	
	a. Public Healthcare (large-sized)	20,000/month
	b. Public Healthcare (small-sized)	15,000/month
	c. Sub-district/village healthcare post	10,000/month
	d. Hospital with high number of visitors	100,000/month
	e. Hospital with medium to low number of visitors	50,000/month
	f. Clinics	40,000/month
8	Final Disposal	
	a. Waste volume < 1 m³	10,000 per disposal
	b. Waste volume 1 m³ to 5 m³	50,000 per disposal
	c. Waste volume > 5 m³	100,000 per disposal
9	Offices	
	a. Government	30,000/month
	b. Private (social enterprise)	25,000/month
	c. Private (commercial enterprise)	75,000/month
10	Incidentals and public recreation centre	
	a. Public event:	
	i Indoor	100,000/activity
	ii Outdoor	200,000/activity
	b. Public recreation:	15,000/month
11	Sport Arena (commercial)	
	a. Indoor	100,000/month
	b. Outdoor	200,000/month
12	Street Vendors	
	a. Permanent	
	i Non-motorized vehicles	500/day
	ii Motorized vehicles	
	two-wheelers	1,000/day

No	Category of Service	Tariff (IDR)
	three-wheelers	2,000/day
	four-wheelers	4,000/day
	b. Non-permanent	
	a. Mat	1,000/day
	b. Low table	2,000/day
	c. Tent	4,000/day
	d. Shelter	5,000/day

Local Regulation of Jambi City 2/2012 Regarding The Retribution of Public Services

No	Category of Service	Tariff (IDR)
a.	Households	3,000/month
b.	Boarding houses	
	1) Occupied < 50 inhabitant	4,000/month
	2) Occupied 50 - 100 inhabitant	7,000/month
	3) Occupied 101 - 200 inhabitant	9,000/month
	4) Occupied > 200 inhabitant	12,000/month
c.	Hotels	
	1. Hotels	
	i 5-star hotels	1,000,000/month
	ii 4-star hotels	800,000/month
	iii 3-star hotels	600,000/month
	iv 2-star hotels	400,000/month
	v 1-star hotels	300,000/month
	2. Budget Hotels	200,000/month
d.	Restaurant/Café	
	1) Restaurant	250,000/month
	2) Bistro (small restaurant)	175,000/month
	3) Café	150,000/month
	4) Food stalls/street vendors	1,000/month
e.	Healthcare service (private):	
	1) Type A Hospital	800,000/month
	2) Type B Hospital	600,000/month
	3) Type C Hospital	400,000/month
	4) Specialized Hospital	200,000/month
	5) Pharmacies	
	i Pharmacies	50,000/month
	ii Drugstore	35,000/month
	6) Optics	30,000/month
	7) Traditional Healthcare	25,000/month
	8) General Practitioners/Dentists	25,000/month
	9) Medical Specialist	50,000/month
	10) Midwife	25,000/month
	11) Maternity clinics	50,000/month
f.	Industry/Factory	
	1) Large scale (Class A)	1,000,000/month
	2) Medium scale (Class B)	800,000/month
	3) Small scale (Class C)	300,000/month
	4) Home Industries	50,000/month
g.	Warehouse (based on areas)	
	1) 0 to 50 m²	150,000/month
	2) 51 to 100 m²	250,000/month
	3) > 100 m²	500,000/month
h.	Theater/Cinema	200,000/month
i.	Offices	
	1) Private	
	i Banks	250,000/month
	ii Non-Banks	
	Large-sized companies (PT)	150,000/month
	Small to Mid-sized companies (PD, CV, Firma)	37,500/month
	iii Public Notary	37,500/month
	iv Legal Aid Institute	37,500/month

No	Category of Service	Tariff (IDR)
	v Non-educational foundation	25,000/month
	vi Union	25,000/month
	vii Organization	30,000/month
	2) Government	
	i Banks	
	Head/Branch Office	40,000/month
	Unit	20,000/month
	ii State/Regional-owned enterprise	40,000/month
	iii Financial Institutions	30,000/month
j.	Shops/Stores	
	1) Groceries/Toys/Bakery	
	i 0 to 35 m²	15,000/month
	ii > 35 m²	30,000/month
	2) Electronics/Musical Instruments/Computers/Celular	
	i 0 to 35 m²	50,000/month
	ii > 35 m²	100,000/month
	3) Building Materials, Glass, Glassware/Tableware, Furniture	
	i 0 to 35 m²	50,000/month
	ii > 35 m²	100,000/month
	4) Jewelry	50,000/month
	5) Studios, printing shops, stationery	
	i 0 to 35 m²	25,000/month
	ii > 35 m²	50,000/month
	6) Clothings, Textiles, Taylor, Carpets	
	i 0 to 35 m²	25,000/month
	ii > 35 m²	50,000/month
	7) Vehicle tools and equipment	
	i 0 to 35 m²	50,000/month
	ii > 35 m²	100,000/month
k.	Supermakets/Markets	
	1) Mini Market	150,000/month
	2) Supermarket/Grocery stores	250,000/month
	3) Shopping Mall/Modern shop	500,000/month
l.	Public recreation centre incl. Fitness & Sport Centre	
	1) Indoor (Permanent)	50,000/month
	2) Outdoor (Non-permanent)	
	i 1 to 3 days	250,000/month
	ii 1 to 7 days	500,000/month
	iii 1 to 14 days	750,000/month
	iv > 14 days	40,000/day
m.	Kiosk	11,000/month
n.	Street Vendors	750/day
o.	Barbershop, Beauty Parlor	30,000/day
p.	Carwash	
	1) four-wheeler	100,000/month
	2) two-wheeler	25,000/month
q.	Workshop	
	1) Turnery	
	i 0 to 75 m²	25,000/month
	ii 76 to 150 m²	50,000/month
	iii > 151 m²	100,000/month
	2) Car Wrokshop	

No	Category of Service	Tariff (IDR)
	i Automobile	
	0 to 75 m²	20,000/month
	76 to 150 m²	40,000/month
	> 151 m²	80,000/month
	ii Motorcycle	30,000/month
	iii Bicycle	10,000/month
r.	Acedemic Institution	
	1) University	30,000/month
	2) Junior High/High School	15,000/month
	3) Elementary School	10,000/month
	4) Pre-school/kindergarten	5,000/month
	5) Training course	15,000/month
s.	Internet Café	50,000/month
t.	Gas Station	
	1) Gas Station	150,000/month
	2) Oil/Gas Stand	20,000/month
u.	Informal Traders (Beduk market)	2,000/day
v.	Car Showroom	
	1) four-wheeler	25,000/month
	2) two-wheeler	50,000/month
w.	Social/Public Events	
	1) 1 to 7 days	35,000/event
	2) > 8 days	4,000/day

References

Bappenas. 2016. Modul Sinkronisasi RPJMD – RPJMN sub bidang kesehatan. Jakarta, Indonesia. https://www.bappenas.go.id/files/modul-sinkronisasi-rpjmd-rpjmn-sub-bidang-kesehatan/Modul%20Sinkronisasi/Modul%20Sinkronisasi%20Provinsi-FINAL.pdf

Bappenas. 2019. List of Medium Term Planned External Loans 2015-2019 (2019 Revision). Jakarta, Indonesia.

Bappenas. 2019. List of Planned Priority External Loans 2019. Jakarta, Indonesia

Bappenas. 2019. List of Planned Grant Projects. Jakarta, Indonesia.

Cave, J. 2014. Who owns urban waste? Appropriation conflicts in emerging countries. Journal of Waste Management and Research, 32 (9), 813-821

ISWA. 2015. Global Waste Management Outlook. Osaka, Japan: United Nations Environment Programme

Jambeck et al. 2015. Plastic waste inputs from land into the ocean. Science, vol. 347, no. 6223, pp. 768–771

McKinsey. 2015. Stemming the tide: Land-based strategies for a plastic-free ocean. Ocean Conservancy and McKinsey Center for Business and Environment

Ministry of Environment and Forestry. (n.d). National Waste Management Information System. http://sipsn.menlhk.go.id/

Ministry of Finance. 2015. Pedoman Proses Perencanaan, Penganggaran, dan Pelaksanaan APBN. Jakarta, Indonesia.

Ministry of Finance. 2019. Kerangka Ekonomi Makro dan Pokok-Pokok Kebijakan Fiskal tahun 2020. Jakarta, Indonesia

Ministry of Finance. (n.d). APBD, Realization of APBD, and Balance Sheet. http://www.djpk.depkeu.go.id/?page_id=316

OECD. 2009. Budgeting in Indonesia. OECD Journal on Budgeting, Volume 2009/2, ISSN 1608-7143.

PT. Arkonin Engineering Manggala Pratama. 2015. Study of National Waste Management Policy and Strategy. Jakarta, Indonesia: Coordinating Ministry of Economic Affairs

Scheinberg, A., D.C. Wilson, & L. Rodic. 2010. Solid Waste Management in the World's Cities: *Water and Sanitation in the World's Cities 2010*. Prepared on behalf of UN-HABITAT. London: http://www.waste.nl/en/product/solid-waste-management-in-the-world-cities

Schuebeler et.al. 1996. Conceptual framework for municipal solid waste management in low income countries. SKAT, St. Gallen, Switzerland. UMP/SDC Collaborative Programme on Municipal Solid Waste Management in Developing Countries. Urban Management Programme (UMP) Working Paper Series, No.9., pp 59. www.skat.ch

Soos, R. A.D. Whiteman, D.C. Wilson et al. 2013a. Operator Models. Respecting Diversity. Concepts for Sustainable Waste Management. Eschborn: GIZ. http://www.giz.de/en/downloads/giz2013-swm-operator-models-sourcebook-en.pdf

Soos, R. A.D. Whiteman, D.C. Wilson et al. 2013b. Operator Models. Respecting Diversity. Guidance Paper for Solid Waste Management Practitioners. GIZ. http://www.giz.de/en/downloads/giz2013-swm-operator-models-sourcebook-en.pdf

Sustainable Waste Indonesia. 2015. Jambi City Waste-to-Energy Baseline Survey. UN ESCAP. https://www.unescap.org/sites/default/files/Jambi%20City%20Waste-to-Energy%20Baseline%20Survey.pdf

Wilson et al. 2012. Comparative analysis of solid waste management in 20 cities. Journal of Waste Management and Research, 30 (3), 237-254. DOI: 10.1177/0734242X12437569

World Bank. 2018. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Washington, D.C: World Bank Group.

World Bank. 2018. Indonesia Marine Debris Hot Spot: Rapid Assessment - Synthesis Report.

World Bank. 2019. *Indonesia - Improvement of Solid Waste Management to Support Regional and Metropolitan Cities Project (English)*. Washington, D.C: World Bank Group. http://documents.worldbank.org/curated/en/608321575860426737/Indonesia-Improvement-of-Solid-Waste-Management-to-Support-Regional-and-Metropolitan-Cities-Project

MALANG REGENCY

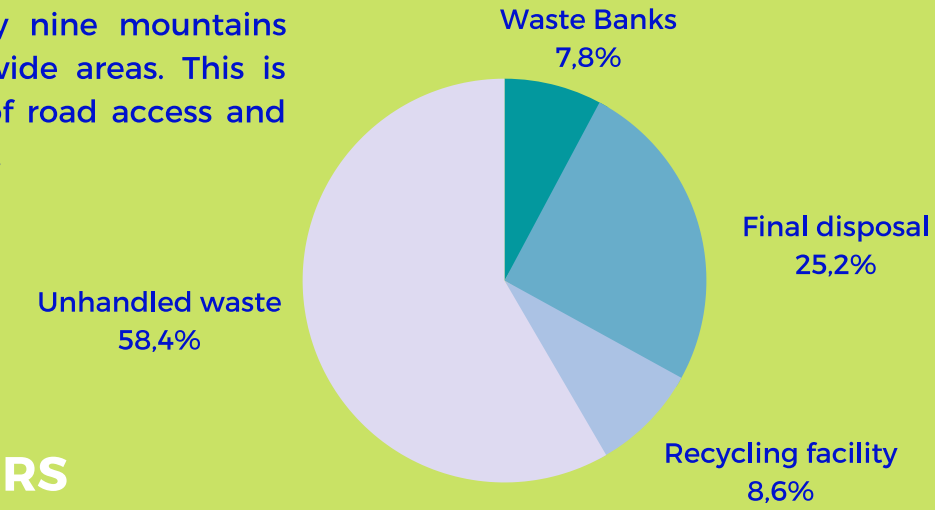
EAST JAVA

ABOUT THE REGENCY

Malang Regency is located in East Java, Indonesia and is one of the largest regencies in Indonesia measured by area. The regency is divided into 33 districts and 390 subdistricts or villages with the capital being Kepanjen City.

The population is scattered across the regency, which itself is surrounded by nine mountains with a hilly geography and wide areas. This is creating challenges in terms of road access and waste collection in the regency.

WASTE



MALANG IN NUMBERS

- 2.576.596 inhabitants
- 3.534,86 km2 area
- 700-1000 ton waste generated per day
- 60 % of the regency is covered by the waste service

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Environmental Protection Agency

waste management

FINANCE & STRUCTURE

The main source of financing of waste services in Malang Regency comes from the local government budget and is used mainly to finance operational expenses in the waste sector. In ad-dition, Malang Regency has also been receiving support from the state budget in the form of assets in the provision of waste management infrastructure, faci-lities and equipment.

The average local budget earmarked for waste management from 2013 to 2019 only reached 0,3% of the total local government budget.

Approximately 75% of the total waste management budget of Malang Regency is allocated for operational expenses.

The contribution of the waste retri-bution revenue to the total waste management budget reached only 6,92% from 2010 to 2019 on average.

0,3%

of total local budget allocated for waste management

6,92%

contribution of waste retribution revenue to the total waste management budget

GOING FORWARD

In 2018, Malang Regency enacted a Local Regulation on General Service Levies in which the local government cooperates with a local bank to avoid administrative leakage as well as increase the collection of waste retribution thus optimizing the revenue through more tracking and mo-nitoring of payments.

In the future, the Environmental Agency of Malang Regency plans to increase the local budget allocated for waste management by optimizing the waste re-tribution revenue.

RECOMMENDATIONS

A better understanding of the present and planned public financing alloca-tions and spendings in the waste management sector should be ensured through a more in-depth assessment.

The amount of financing for the waste management system should be increased in the coming years, being a priority in both national and local budgets. Moreover, the accountability and effectiveness of fund utilisation for all waste services must be improved.

It is encouraged that the retribution tariff is adjusted at least every third year, as mandated in the Act 28/2009.

WASTE IS A RESOURCE

The basic understanding and approach to waste management needs to be altered so that waste is seen as a **resource** and is effectively utilised based on circular economy principles. A more effective separation and collection system should be developed to foster this shift.

DEPOK

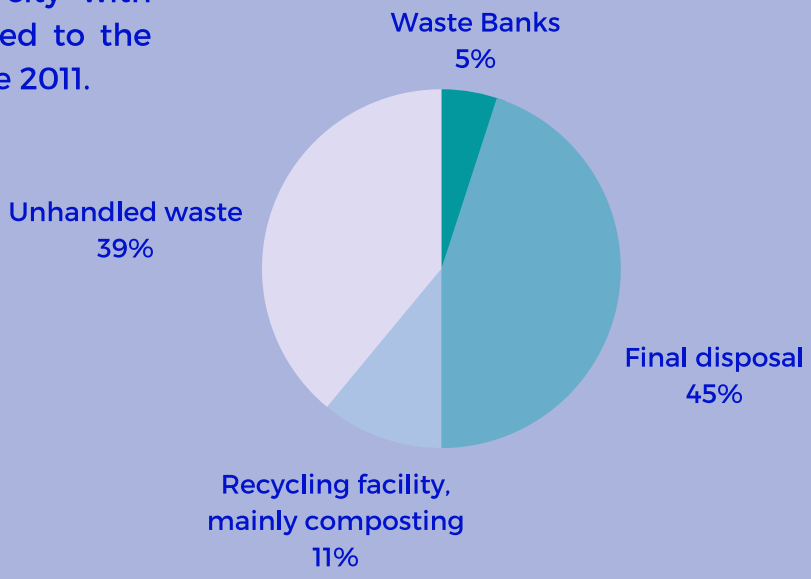
GREATER JAKARTA

ABOUT THE CITY

Depok is part of the Greater Jakarta area and serves as a satellite city to Jakarta. Many citizens of Depok cross-commute to the capital every day to work.

Depok has been chosen as the first city with natural gas pipe line network connected to the households and has been operated since 2011.

WASTE



THE CITY IN NUMBERS

- 2.179.813 inhabitants
- 200,29 km2 area
- 1.320 ton waste generated per day
- 60 % of the city is covered by the waste service

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waste management

FINANCE & STRUCTURE

The source of financing of waste services in Depok City comes from the city budget and is mobilized to finance the operational expenses of waste management in the city. In addition, the city has also been receiving support from the state budget through provision of waste management infrastructure, facilities and equipment. Otherwise, the city has never received support from other donors.

The estimated number of the average local budget earmarked for the agency responsible for waste management from 2010 to 2017 reached 6,81% of the total local government budget. This number is, however, very likely to be much lower as the budget does not only cover waste management alone.

6,81%*

of total local budget allocated for agency responsible for waste management

5,27%

contribution of waste retribution revenue to the total agency's budget

*Estimated number and the budget might not be mobilized for waste management alone.

The contribution of the waste retribution revenue to the total agency's budget reached only 5,27% from 2010 to 2013 on average.

GOING FORWARD

In the future, the Environmental Agency of Depok City and the Water Utility plans to combine the waste retribution with the water utility bills to optimize the collection mechanism.

RECOMMENDATIONS

A better understanding of the present and planned public financing allocations and spendings in the waste management sector should be ensured through a more in-depth assessment.

The amount of financing for the waste management system should be increased in the coming years, being a priority in both national and local budgets. Moreover, the accountability and effectiveness of fund utilisation for all waste services must be improved.

It is encouraged that the retribution tariff is adjusted at least every third year, as mandated in the Act 28/2009.

WASTE IS A RESOURCE

The basic understanding and approach to waste management needs to be altered so that waste is seen as a **resource** and effectively utilised based on circular economy principles. A more effective separation and collection system should be developed to foster this shift.

BANDA ACEH

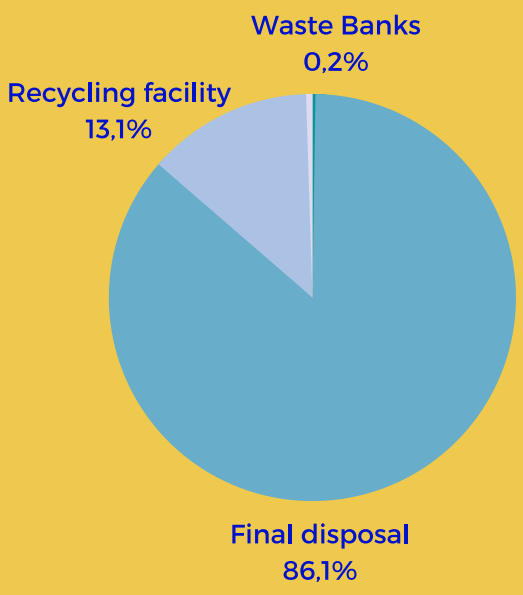
NORTHERN SUMATRA

ABOUT THE CITY

Banda Aceh is the capital and largest city in the province of Aceh located on the northwestern tip of the island of Sumatra, Indonesia.

Final disposal of waste in Banda Aceh City is mostly done through transfer stations where all collected waste from collection vehicles are transferred with larger trucks for disposal at the regional landfill of Blang Bintang approximately 15-20 km away from the city landfill. However, the city only allows transport of maximum 180 ton/day.

WASTE



THE CITY IN NUMBERS

- 268.148 inhabitants
- 61,36 km2 area
- 210 ton waste generated per day
- 90 % of the city is covered by the waste service

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waste management

FINANCE & STRUCTURE

The main source of financing for waste management in Banda Aceh City comes from the city budget and is used mainly to finance operational expenses of waste management in the city. A small portion of the city budget is also mobilized to finance the provision of supporting infrastructure and facilities such as the construction of a com-posting hall and collection point. Banda Aceh has also received support from the state budget but none from private investments or any other sources for activities in the waste sector.

The average local budget earmarked for waste management from 2014 to 2018 only reached 2,18% of the total local government budget.

The contribution of the waste retribution revenue to the total waste management budget reached only 16,5% from 2014 to 2018 on average.

2,8%

of total local budget allocated for waste management

16,5%

contribution of waste retribution revenue to the total waste budget

WASTE RETRIBUTION

The structure of the waste tariff is organised based on the source category and its size. The collection of waste retribution follows the most common collection mechanism in which retribution officers manually collect the direct payment from each household and deposits the cash receipts directly at the local government treasury within 24 hours.

RECOMMENDATIONS

A better understanding of the present and planned public financing allocations and spendings in the waste management sector should be ensured through a more in-depth assessment.

The amount of financing for the waste management system should be increased in the coming years, being a priority in both national and local budgets. Moreover, the accountability and effectiveness of fund utilisation for all waste services must be improved.

It is encouraged that the retribution tariff is adjusted at least every third year, as mandated in the Act 28/2009.

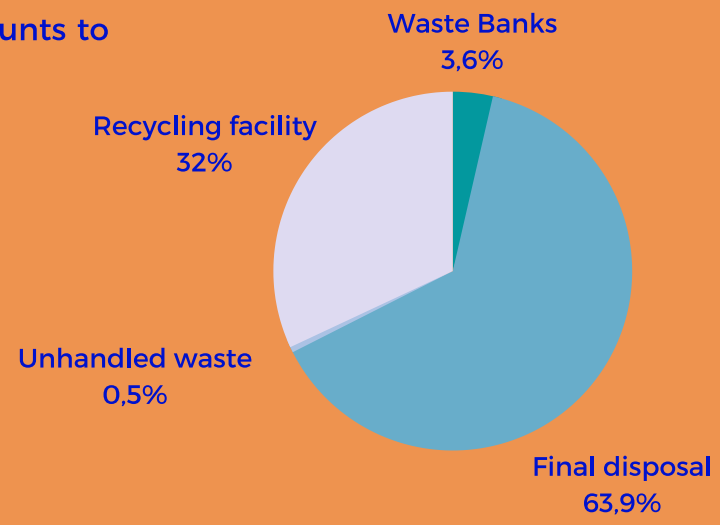
WASTE IS A RESOURCE

The basic understanding and approach to waste management needs to be altered so that waste is seen as a **resource** and effectively utilised based on circular economy principles. A more effective separation and collection system should be developed to foster this shift.

BUKITTINGGI

WEST SUMATRA

Bukittinggi is the third largest city in West Sumatra, Indonesia and serves as a meeting point for traders from surrounding cities particularly during market days. This has a direct impact on the amount of waste generated in the city, as the waste generated from these markets amounts to 24,5% of the city's total waste generation.



BUKITTINGGI IN NUMBERS

126.804 inhabitants

25,24 km2 area

154,42 ton waste generated per day

90 % of the city is covered by the waste service

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waste management

FINANCE & STRUCTURE

The local budget is the main source of financing for waste management in Bukittinggi City. The local budget is mainly mobilized to finance the operational expenses and a small portion is used to finance the provision of waste infrastructure and facilities.

The city also received support from the state budget in providing, mostly, waste management infrastructure and facilities, while the Indonesian state-owned bank, Bank BNI supported the city in the provision of waste bins.

The average local budget allocated for waste management from 2014 to 2018 only reached 0,61% of the total local government budget.

The contribution of the waste retribution revenue to the total waste management budget reached 18,5% from 2014 to 2018 on average.

0,61%

of total local budget allocated for waste management

18,5%

contribution of waste retribution revenue to the total waste budget

WASTE RETRIBUTION

The tariff classification is determined based on the source category as well as the volume of waste generated.

The collection mechanism follows a similar pattern of retribution collection as in Banda Aceh but includes retribution officers from both the Environmental Agency and the local government.

RECOMMENDATIONS

A better understanding of the present and planned public financing allocations and spendings in the waste management sector should be ensured through a more in-depth assessment.

The amount of financing for the waste management system should be increased in the coming years, being a priority in both national and local budgets. Moreover, the accountability and effectiveness of fund utilisation for all waste services must be improved.

It is encouraged that the retribution tariff is adjusted at least every third year, as mandated in the Act 28/2009.

WASTE IS A RESOURCE

The basic understanding and approach to waste management needs to be altered so that waste is seen as a **resource** and effectively utilised based on circular economy principles. A more effective separation and collection system should be developed to foster this shift.

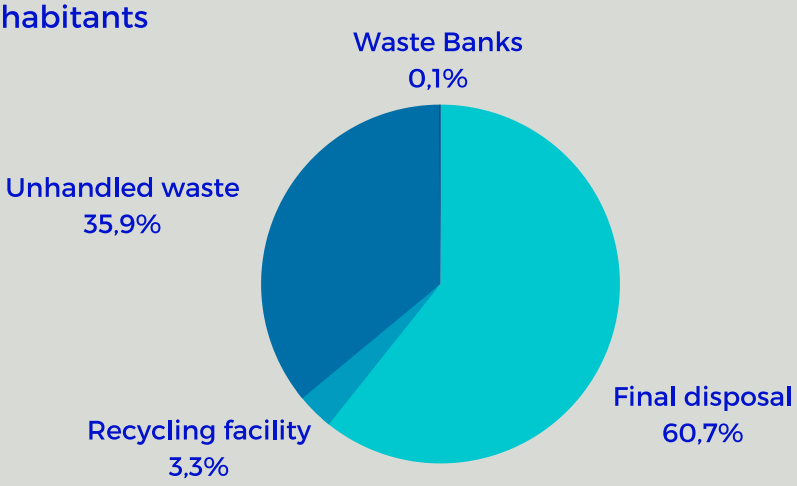
JAMBI

CENTRAL SUMATRA

ABOUT THE CITY

Jambi is the capital and largest city in the province of Jambi located on the island of Sumatra, Indonesia. Batanghari River flows through the city of Jambi and is one of the longest rivers in Sumatra. The area surrounding the river is located in lowlands and considered most exposed to floods why many inhabitants live in stilt houses.

WASTE



THE CITY IN NUMBERS

591.340 inhabitants

205,38 km2 area

461,25 ton waste generated per day

100 % of the city is covered by the waste service

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waste management

FINANCE & STRUCTURE

The local budget is the main source of financing for waste management in Jambi City. The local budget is mainly mobilized to finance the operational expenses of waste management in the city, while support from the state budget is generally mobilized for the provision of waste infrastructure and supporting facilities.

The average local budget allocated for waste management from 2010 to 2013 only reached 1,3% of the total local government budget.

The contribution of the waste retribution revenue to the total waste management budget reached 47,8% from 2010 to 2013 on average and is thus significantly high compared to other cities.

1,3%

of total local budget allocated for waste management

47,8%

contribution of waste retribution revenue to the total waste budget

WASTE RETRIBUTION

The tariff classification is determined based on the category of waste source.

The collection mechanism of waste retribution follows the most common mechanism practiced in cities. The collecting of retribution is practiced manually, where the retribution officers delivers the retribution ticket stating the amount billed each month to each user. The users pay in cash directly to the retribution officer and are then delivered the treasurer, who will then deposit to the local government treasury within 24 hours.

RECOMMENDATIONS

A better understanding of the present and planned public financing allocations and spendings in the waste management sector should be ensured through a more in-depth assessment.

The amount of financing for the waste management system should be increased in the coming years, being a priority in both national and local budgets. Moreover, the accountability and effectiveness of fund utilisation for all waste services must be improved.

It is encouraged that the retribution tariff is adjusted at least every third year, as mandated in the Act 28/2009.

WASTE IS A RESOURCE

The basic understanding and approach to waste management needs to be altered so that waste is seen as a **resource** and effectively utilised based on circular economy principles. A more effective separation and collection system should be developed to foster this shift.