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# Results-Based Financing *for* Solid Waste Management

## Results and Lessons from the World Bank-Financed Project Experience

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# Results Based Financing *for* Solid Waste Management





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# Abbreviations and Acronyms

CBO	Community-Based Organizations	JSC	Joint Service Council
CCIF	City Cleaning Investment Fund	LMIC	Low-and Middle-Income Country
DLI	Disbursement-Linked Indicator	MDLF	Municipal Development and Lending Fund
DPL	Development Policy Loan	M&E	Monitoring and Evaluation
FCV	Fragility, Conflict, and Violence	NGO	Non-Governmental Organization
GPRBA	Global Partnerships for Results-Based Approaches	O&M	Operation and Maintenance
ICR	Implementation Completion Report	OSR	Own Source Revenue
IEG	Independent Evaluation Group	PBG	Performance-Based Grant
IFC	International Finance Corporation	PforR	Program for Results
IFVA	Independent Financial Verification Agent	RBF	Results-Based Financing
IPF	Investment Project Financing	SOP	Standard Operating Procedure
ITVA	Independent Technical Verification Agent	SWM	Solid Waste Management
IWA	Independent Verification Agent	TDF	Town Development Fund
		UNOPS	United Nations Office for Project Services



# Acknowledgments

This report is a knowledge product funded by the Global Partnerships for Results-Based Approaches (GPRBA) housed in the Infrastructure, Disaster Risk Management, and Urban Global Department (IDUGD) at the World Bank. The team consists of Hyunji Lee, Ibrahim Ali Khan, and Amsale Bumbaugh. Valuable background research and editorial support was provided by Vibhu Jain and Emma Heneine. We are grateful to Angelica Nunez del Campo, Practice Manager, and Kremena Ionkova, Lead Urban Specialist for their guidance and support. We also want to thank Maitreyi Das for her leadership and assistance during the early stages of the report generation.

The team is grateful to the peer reviewers, Jan Philipp Grotmann-Hoefling, Senior Urban Development Specialist, and Marcus Lee, Senior Urban Economist, for their excellent technical inputs. The team also extends appreciation to Andrey Shanin, Harsh Goyal, Phoram Shah, Poonam Ahluwalia, Yasser Dweik, and Zhiyu Chen for their valuable inputs. The report has been edited by Lisa Ferraro Parmelee and designed by The Word Express, Inc.

Funding for this publication was provided by GPRBA, an umbrella multi-donor trust fund, housed at the World Bank's Urban, Rural, Land and Resilience Global Practice.

# Purpose and Audience

The report presents an analysis of the World Bank-financed investments that use results-based financing (RBF) approaches in the solid waste management (SWM) sector. It reviews the World Bank's investment portfolio to identify relevant projects and assess the design of their RBF approaches, focusing on financial incentives applied, verification and monitor-

ing of results, and institutional arrangements. It also showcases the impacts of the reviewed projects, where that information is available. Intended for World Bank task teams and external development practitioners, the report provides insights and identifies opportunities to improve the design of RBF approaches and scale up their application in the SWM sector.



# Executive Summary

**Achieving a livable planet is contingent on how global waste is generated and treated.**

Driven by economic growth and rapid urbanization, global waste generation is expected to increase 73 percent by 2050 (Kaza, Shrikanth, and Chaudhary 2021). This problem is especially acute in low- and middle-income countries (LMICs) in Africa and South Asia. In Africa alone, waste generation will triple by 2050, reaching 600 million tonnes per year. Moreover, waste management practices are often unsustainable and inadequate to cope with this rapidly increasing volume of waste. About 27 percent of global waste goes uncollected and, in low-income countries, waste mismanagement is widespread, with 93 percent of waste either dumped or burned, adversely affecting the environment and human health (UNEP 2024; Kaza et al. 2018).

**The World Bank is committed to laying the foundations for building sustainable solid waste management (SWM) systems.**

According to the Bank's 2019 lending portfolio review, US\$290 million is directed annually toward the SWM sector,<sup>1</sup> with an average expenditure of US\$29 million per project (World Bank 2020c). The common objective of these investments is to reduce environmental and health risks by enhancing SWM systems. To achieve this objective, the investment projects deploy various financing instruments with technical designs tailored to local needs to offer effective solutions. In particular, the projects seek to address at least one of several bottlenecks to sustainable SWM systems: unclear governance structure, inadequate financ-

ing mechanisms, and limited access to quality SWM infrastructure and services.

**Despite such efforts, more work is needed to achieve functional and sustainable SWM systems in LMICs.**

According to a recent review by the Independent Evaluation Group (IEG), the Bank is, by far, the leader among multilateral development banks in SWM finance and knowledge (World Bank, 2022c). To further improve the value for money of the Bank's investments in the SWM sector, however, the review identified the need for greater focus on financial sustainability, effective policy revisions and implementation, and land acquisition for waste infrastructure. It also recommended increasing the representation of low-income countries, where SWM issues are growing most rapidly, and integrating waste hierarchy and circular economy principles into national strategies in LMICs. Lastly, it emphasized that greater efforts are required to achieve accountability in providing adequate and sustainable SWM services.

**Over the past decade, results-based financing (RBF) has been piloted and scaled up to fill the institutional, financing, and operational gaps in enhancing SWM systems in LMICs.**

By tying payments directly to the achievement of predefined, verifiable results, RBF provides incentive to stakeholders to conduct activities which improve

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<sup>1</sup> Referenced average annual investment refers to FY2014–2020.

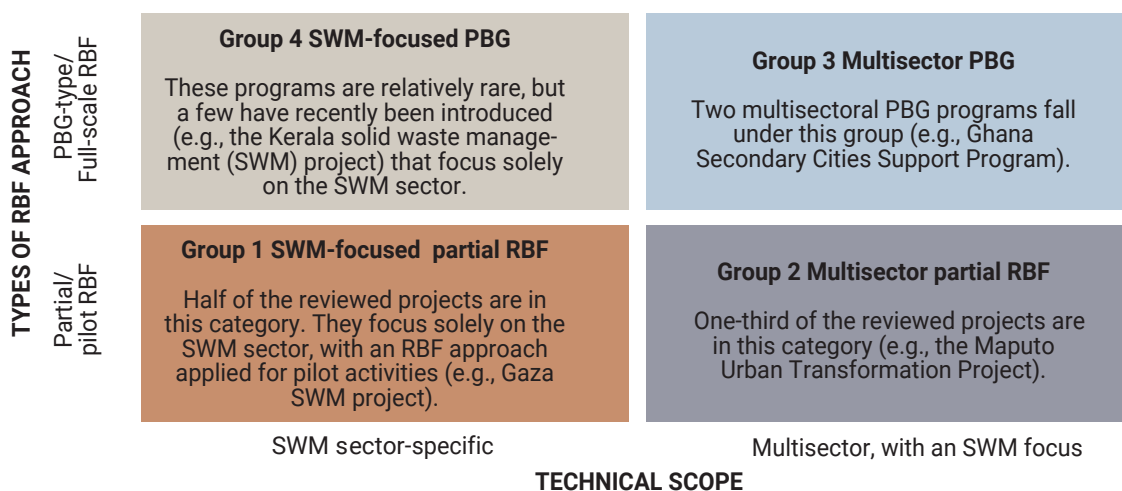
municipal SWM systems. This report identifies nineteen Bank-financed investment projects that have utilized different RBF approaches to improve SWM systems since 2012 or will be doing so in the near future. The design of RBF approaches is diverse; it can be categorized by technical scope—either sector-focused or multisectoral—and by scale, ranging from small-scale pilots to large-scale institutional reform programs (Figure ES.1).

**RBF approaches provide municipalities with financial incentives to create the building blocks for sustainable SWM ecosystems.** This report found that two-thirds of sixty-two performance-based indicators identified in the reviewed Bank projects are directed toward municipalities. Of these indicators, 23 percent are intended to improve institutional arrangements, while 15 percent seek to increase financial sustainability by reducing costs and/or increasing revenue col-

lection. More than half of the indicators directly measure increased access to SWM infrastructure and services, with the assumption that municipalities (or other institutions) put their efforts toward delivering intermediate outputs (that is, improved institutional and financial arrangements) to achieve service outcomes (that is, improved sector performance). Notably, only two indicators address social inclusion (Figure ES.2).

**RBF approaches can enhance the transparency and credibility of institutional arrangements for SWM systems.** In LMICs, roles and responsibilities of stakeholders are often unclear, resulting in a significant disparity between ambitious national SWM strategies and the limited capacity of municipal SWM systems (World Bank 2021d). RBF is designed to bridge this institutional gap by putting into place a collaborative institutional framework, typically involving municipalities, central government bod-

**Figure ES.1**  
**Types of Results-Based Solid Waste Management Projects Financed by the World Bank**



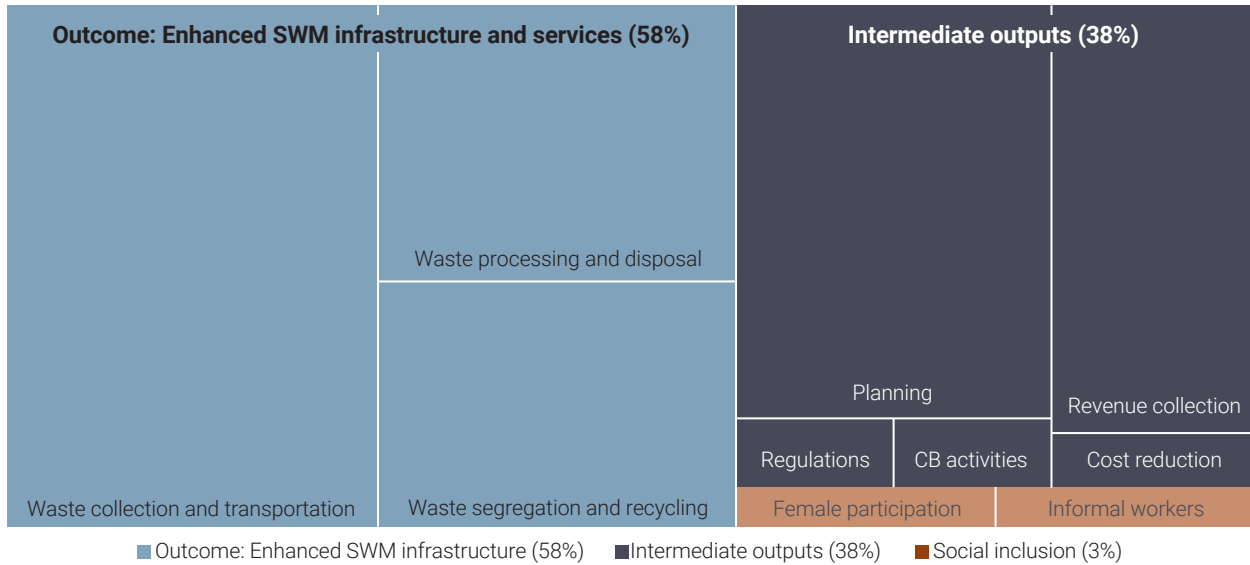
Source: World Bank team.

Note: SWM = solid waste management; PBG = performance-based grant; RBF = results-based financing.

<sup>a</sup> Projects named in the figure include: Kerala SWM Project (P168633); Ghana Secondary Cities Support Program (P164451); Gaza SWM Project (P171328); Maputo Urban Transformation Project (P171449).



**Figure ES.2**  
**Performance Categories for Results-Based Solid Waste Management Projects**



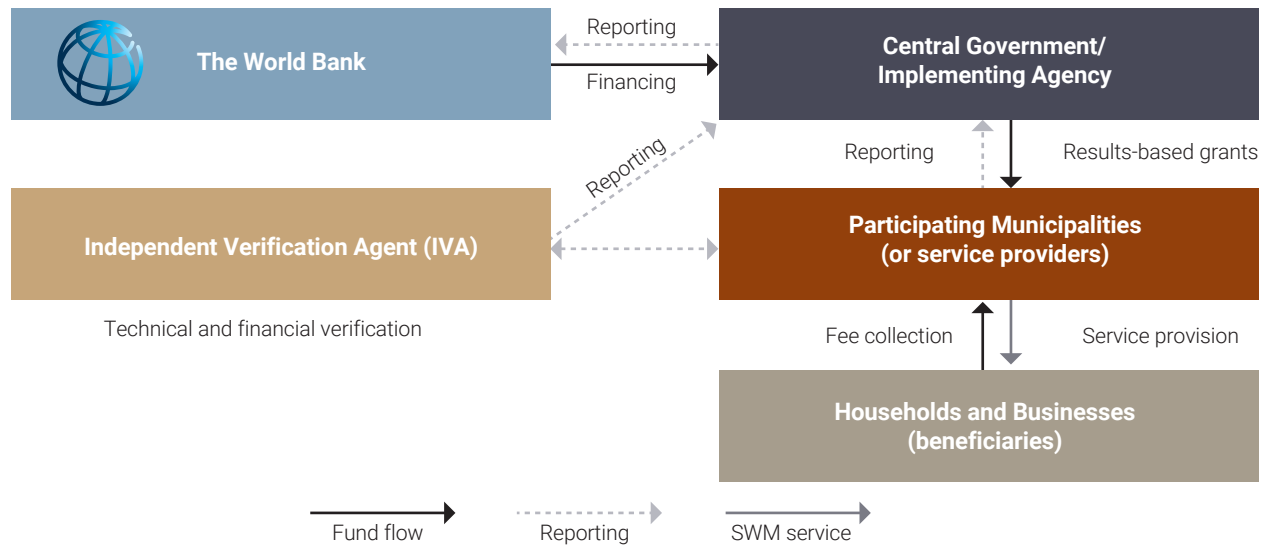
ies, independent verification agents (IVAs), and a financier, such as the World Bank (Figure ES.3). A unique feature of institutional arrangements for RBF approaches is the involvement of an IVA in the performance monitoring and verification process, which is essential for providing adequate economic incentives and fostering stakeholder trust. This robust verification system not only helps enhance the public sector capacity; it establishes enabling environments for private sector engagement, as observed in the West Bank (see Chapter 4).

Institutions targeted in RBF projects depend on the size and objectives of a results-based SWM investment project. Large-scale RBF programs, such as performance-based grants (PBGs) (see Chapter 2), tend to pursue broad institutional reforms at national, regional, and local levels (for example, the Kerala SWM Project), while smaller-scale pilots often pinpoint specific aspects of participating municipalities' institutional capac-

ity. Although results from RBF approaches to SWM institutional strengthening are still limited, a few promising cases emerge. A results-based project in Ghana, for example, provides incentive to participating municipalities to establish a SWM monitoring system and to make relevant documents publicly available. This approach has contributed to an increase of 40 percent in the performance scores of participating municipalities.

**The RBF approach has also been found effective in improving the financial sustainability of SWM systems.** Results-based SWM projects are often designed to give municipalities (or other service providers) incentives to enforce fee collection and prioritize SWM in budget allocations. Some projects have successfully increased fee collection both in coverage and amount, demonstrating the potential for self-sustaining SWM services. Such sustainable SWM systems are possible when RBF triggers incremental changes to existing systems that can be

**Figure ES.3**  
**Institutional Arrangement for Results-Based Solid Waste Management Projects**



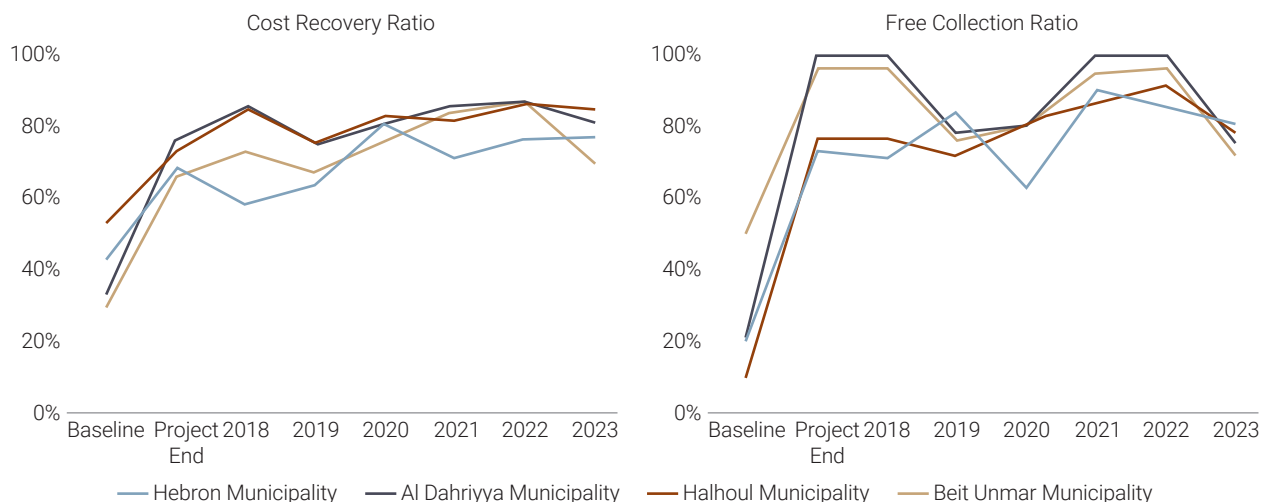
maintained without additional financial resources—for example, increasing revenue by expanding the registered user base in the existing billing system. The increase in solid waste fee collection and cost recovery ratio that surpassed the planned targets in the West Bank SWM project, for instance, is largely attributed to the implementation of fee collection strategies that included the integration of the SWM fees into electricity bills, the establishment of tariffs at the provincial level, and capacity-building activities with municipalities. The fee collection and cost recovery ratios were stably maintained at around 80 percent after the project closure in 2018, except for drops associated with COVID-19 in 2020 and the conflict escalations taking place in the country since late 2023 (Figure ES.4).

**By addressing institutional and financing challenges, RBF approaches have contributed to improved operational performances of municipalities**

**in the SWM sector.** RBF approaches can strategically motivate municipalities to enhance waste collection and transportation services. In Nepal, a results-based SWM project expanded the waste collection services to approximately 120,000 households and increased the average waste collection service coverage to about 70 percent in all the participating municipalities (Figure ES.5). RBF approaches can also improve waste processing and disposal at landfills and transfer stations. In Gaza, results-based grants were provided to the service provider, Joint Service Council (JSC), to cover increased operational costs for new SWM infrastructure, including a sanitary landfill, transfer stations, collection equipment, and medical waste treatment facilities. Stable operation and maintenance of SWM infrastructure helped divert an estimated 641,540 tonnes of waste from unregulated dumping to the sanitary landfill from 2019 to 2022 during the project implementation. Expe-



**Figure ES.4**  
**Increase in Cost Recovery and Fee Collection Ratios in the West Bank**



perience has also demonstrated that, under certain conditions, incentive schemes can effectively drive behavioral change among residents, particularly for waste segregation and recycling, as seen in Ningbo, China (see Chapter 3).

**Such positive results can be achieved when RBF is carefully designed and implemented. Key considerations include, but are not limited to, the following (see Chapter 4):**

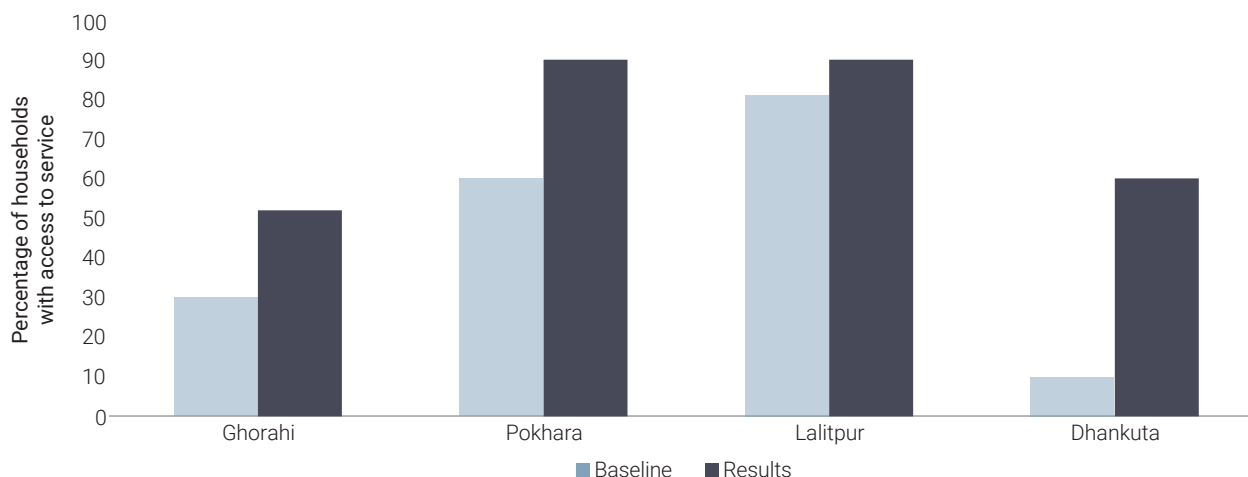
- **Tailoring design of RBF approaches to local contexts.** Large-scale PBG programs, for example, can be mobilized to promote multilevel institutional reforms in relatively advanced contexts, while smaller-scale pilot RBF schemes with lower institutional capacity requirements may be better suited for challenging contexts, such as in fragility, conflict, and violence (FCV) settings. Financial incentives also need to be specific, measur-

able, adequate, realistic, and targeted to the specific challenges involved in enhancing the SWM sector in each context.

- **Ensuring reliable baseline data** to establish feasible and quantifiable targets for projects. In many cases, however, especially in LMICs, such baseline data are unavailable or unreliable. It is therefore important to address information shortfalls by providing technical assistance to countries to collect needed data and conduct baseline studies to inform project targets.
- **Establishing financing arrangements for upfront costs from project onset,** balancing performance risk transfer with the provision of necessary capital, especially where capacity is constrained. Available options include a phased funding arrangement with minimum conditions; an advancement arrangement, made by the central government (or other implementing agencies); and the provision of upfront capital by the private sector.



**Figure ES.5**  
**Increase in Households with Access to Waste Collection Service in Nepal**



- **Raising awareness, engaging in outreach, and fostering local ownership** to sustain the improved SWM systems beyond a project's closure. In some instances, participatory RBF methods have successfully influenced behavior, strengthened local ownership, cultivated trust, and set projects on a path toward sustainable outcomes.
- **Engaging the private sector if certain institutional and financial conditions are in place.** In principle, an RBF approach, which entails an independent evaluation system and quantifiable results measurement, can effectively enhance the transparency, credibility, and viability of institutional and financial systems for the SWM sector, thereby creating more favorable conditions for private sector participation across the SWM chain. Pursuing private engagement under a results-based SWM project, however, is deemed viable only if a revenue model is clear, with potential for scalability in a stable political context.

**This report serves as an important resource in understanding the impact of the Bank's RBF portfolio to improve SWM systems and infrastructure.** While some favorable results from completed projects indicate a promising pathway, the short timeframe in which the portfolio has evolved makes it still premature to determine the long-term effectiveness of RBF in maintaining the desired impacts. Doing so requires further research in the coming years as more projects, including the recent, large-scale, SWM-focused PBGs, are fully implemented and ready for evaluation. Additional future research areas may include: (i) assessing cost and benefit of RBF in comparison to conventional input-based approaches to SWM; (ii) demystifying pricing mechanisms for RBF approaches (e.g., pricing indicators and waste tariffs) whose complexity and context-dependent nature can pose challenges to effective planning and implementation; and (iii) continuing to take stock of new techniques and tools deployed through RBF and their value in addressing emerging challenges in the sector.





1

# Introduction



## Background

As urbanization and economic development progress, municipal solid waste generation is projected to increase from 2.24 billion tonnes in 2020 to 3.88 billion tonnes by 2050 (Kaza, Shrikanth, and Chaudrari, 2021), with emerging economies expected to see the sharpest increase. In Sub-Saharan Africa, total waste generation is projected to triple by 2050, and in South Asia it will double; the two regions together will account for 35 percent of the world's waste (Kaza et al. 2018).

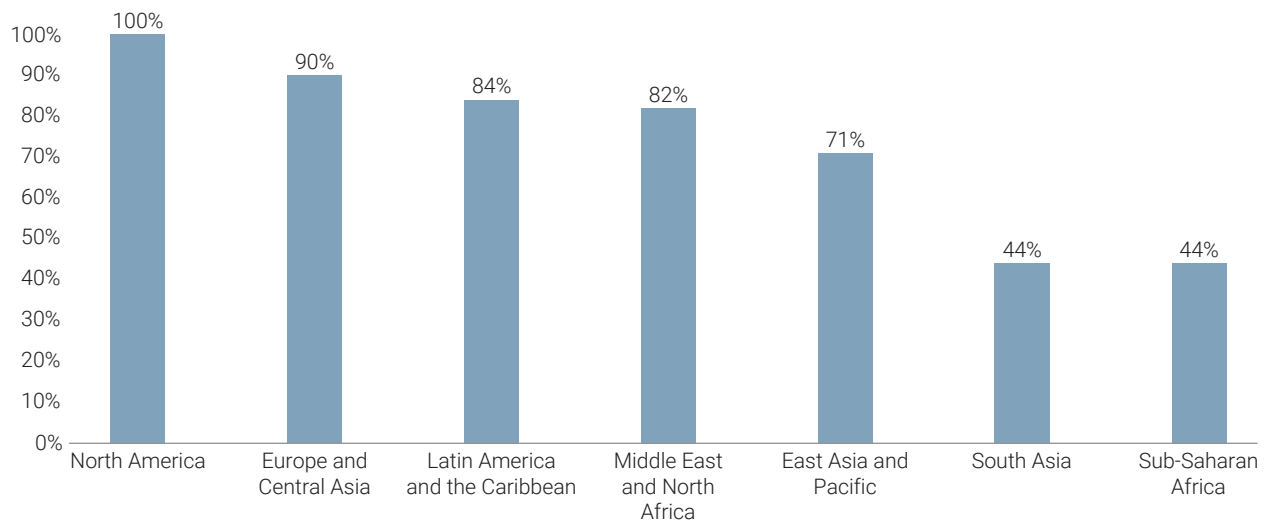
Management practices to deal with waste are often unsustainable. An estimated 2.7 billion people lack access to collection services (Figure 1.1). As a result, a total of around 540 million tonnes of municipal solid waste, or 27 percent of the global total, goes uncollected, and only 8 percent

reaches sanitary landfills equipped with landfill gas collection systems (UNEP 2024). Waste mismanagement is also widespread in low-income countries, where 93 percent of waste is either dumped or burned (Kaza et al. 2018).

Inadequate waste management practices contribute significantly to climate change and pose severe risks to human health and the environment, including those that arise from climate change, along with air and water pollution, land degradation, and the release of methane and hazardous leachates. Without improvements in the SWM sector, solid waste-related emissions are expected to reach 2.6 billion tonnes of CO<sub>2</sub>-equivalent annually by 2050 (Kaza et al. 2018).

Bridging the institutional, operational, and financial gaps in establishing functioning basic SWM systems is, therefore, urgent. To help accomplish

**Figure 1.1**  
**Waste Collection Rates by Region**



Source: Kaza et al. 2018.



this, the World Bank has invested US\$290 million per year<sup>2</sup> in SWM enhancement for LMICs (World Bank 2020c). Most of the investment has been directed toward increasing access to basic infrastructure and services, including the collection and transportation of waste and its disposal at sanitary landfills, with an increasing emphasis on the promotion of “circular economy” through waste reduction and recovery. The investment projects have deployed various financing instruments with different technical designs to offer solutions tailored to local needs.

Despite such efforts, much more needs to be done to achieve functional and sustainable SWM systems in LMICs. Covering 117 projects financed by the Bank and implemented across 55 countries between fiscal years 2010–2020, the IEG evaluated how well the Bank supports client countries to manage solid waste using an integrated approach to advance development and sustainability goals. According to the review, the Bank is, by far, the leader among multilateral development banks in SWM finance and knowledge (World Bank, 2020c). To further improve the value for money of the Bank’s investments in the SWM sector, however, the review identified several areas of improvement. Firstly, while the reviewed projects have been generally effective, it is often undermined by several key factors including insufficient attention to financial sustainability, effective policy revisions and implementation, and land acquisition for waste infrastructure. Additionally, low-income countries, where SWM issues are growing most rapidly, are underrepresented in the Bank’s portfolio. Although the Bank has increasingly promoted waste hierarchy and circular economy principles to enhance SWM and

support broader sustainability goals, these principles are not yet widely integrated into many national strategies. Finally, the report found that greater efforts to achieve accountability in providing adequate and sustainable SWM services can contribute to success.

RBF has been piloted and scaled up as a financial mechanism to support and provide incentive to stakeholders to meet milestones toward sustainable SWM systems. RBF links payments to the achievement of specific, agreed-upon, and verified results, shifting the emphasis from traditional input-based funding to a results-oriented model that rewards quantifiable outcomes (World Bank 2018a). By linking disbursements to measurable results, RBF promotes efficiency, accountability, and transparency in resource use. Given the often-limited capacity of municipal SWM systems, RBF fosters innovation by motivating implementers to adopt best practices and to address pressing challenges (World Bank 2021d). One of the unique features of RBF is the involvement of an IVA to monitor performance and verify results—bringing credibility to implementing institutions and fostering stakeholder trust. This robust verification system not only helps enhance the public sector capacity; it establishes enabling environments for private sector engagement which is often needed for sustainable service delivery. Finally, by improving the efficiency of SWM services, RBF can generate cost savings and increased revenue collection critical to sustainable service delivery. And by improving the overall quality of service delivery, RBF, in turn, increases the financial sustainability of SWM sys-

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<sup>2</sup> Referenced annual investment refers to FY2014–2020.



tems by increasing local buy-in and willingness to pay for the services.

Since 2012, the World Bank has increasingly adopted a wide range of RBF approaches in its SWM investment portfolio (World Bank, 2020c). Yet, a systematic understanding of the design and implementation of these approaches in the sector is still limited. This report seeks to fill this knowledge gap to guide the Bank’s task teams and development partners with opportunities to refine and scale up RBF approaches in the SWM sector.

## Report Objective and Methodology

Building upon lessons learned from the World Bank’s experience over the past decade, this report, funded by the GPRBA, provides metrics

and high-level analysis of the results-based SWM projects financed by the Bank and explores ways to improve their design and implementation.

A review conducted for the report identified nineteen results-based SWM projects that meet the following criteria: (i) include relevant investment activities in the SWM sector; (ii) explicitly apply the RBF approach (see Chapter 3 for more detail); and (iii) were approved by the World Bank Group Board of Executive Directors between fiscal years 2012 and 2024.

In addition to the reviewed projects listed above, a few projects that are under preparation are included in the report to better capture the recent trend of designing RBF approaches in the SWM sector. These projects include: the Indonesia Local Service Delivery Improvement Project (P180270) and the Morocco Municipal

**Table 1**  
**List of the Reviewed Results-Based SWM Projects**

P-Code	Project Name	Financing Instrument	Country	Year of Approval	Amount (US\$ M)	Project Status
P118152	Urban Local Government Strengthening Program	P-for-R	Tanzania	2012	255	Closed
P123323	Ningbo Municipal Solid Waste Minimization and Recycling Project	IPF	China	2013	252.2	Closed
P130461	Output-Based Aid for Municipal SWM Project	IPF	Nepal	2013	4.28	Closed
P132268	SWM OBA Pilot in West Bank	IPF	West Bank	2013	8.26	Closed
P146460	Jamaica Integrated Community Development Project	IPF	Jamaica	2014	42	Closed
P153814	Metro Manila Flood Management Project	IPF	Philippines	2018	207.6	Active

*(continued on next page)*



**Table 1**  
**List of the Reviewed Results-Based SWM Projects** *(continued)*

P-Code	Project Name	Financing Instrument	Country	Year of Approval	Amount (US\$ M)	Project Status
P164330	Greater Accra Resilient and Integrated Development Project	IPF	Ghana	2019	200	Active
P164451	Ghana Secondary Cities Support Program	P-for-R	Ghana	2019	100	Active
P171328	Gaza Solid Waste Management Project	IPF	Gaza	2020	3.25	Closed
P173261	Additional Financing; Cheesemanburg Landfill and Urban Sanitation Project	IPF	Liberia	2020	16.7	Active
P168633	Kerala SWM Project	IPF	India	2021	105	Active
P171449	Maputo Urban Transformation Project	IPF	Mozambique	2021	100	Active
P174267	China Plastic Waste Reduction Project	IPF	China	2021	430	Active
P169425	Msimbazi Basin Development Project	IPF	Tanzania	2022	200	Active
P175221	Chennai City Partnership: Sustainable Urban Services Program	P-for-R	India	2022	150	Active
P176989	China Plastic Waste Reduction Project (Shaanxi)	IPF	China	2023	250	Active
P181053	Second Additional Financing – Yemen Integrated Urban Services Emergency Project II	IPF	Yemen	2023	19.5	Active
P170976	Solid Waste and Plastic Management Improvement Project	IPF	Cambodia	2023	60	Pipeline
P176163	Clean And Resilient Environment for Blue Sea Project	IPF	Albania	2024	80	Pipeline

Solid Waste Management Support Program (P178768) (see Chapter 3).

The first screening of the projects built upon available information and data from the following sources:

- *Results-Based Financing for Municipal Solid Waste, July 2014*, which shares lessons from eight countries that applied RBF approaches

in the design and preparation of SWM projects.

- *Municipal Solid Waste Management Portfolio Review, 2021*, which captures trends in institutional lending to the SWM sector between 2014 and 2020 and highlights recent patterns in project themes and lending activity.
- *Official project documents from the Operations Portal*, including project appraisal documents, a project operations manual, implementation



support reports, and implementation completion reports (ICRs).

- *IEG Portfolio review FY10–20*, a comprehensive portfolio review spanning fiscal years 2010 to 2020 that encompasses all municipal SWM-related activities undertaken by both the World Bank and the International Finance Corporation (IFC), offering a detailed examination of the Bank Group’s strategic approach to and involvement in the implementation of SWM projects and identifying areas in need of attention and improvement.

Additional details on the reviewed projects were collected through in-depth desk reviews and short interviews and surveys conducted with the Bank task teams involved in the projects’ design and implementation.

The results-based SWM projects identified underwent a set of quantitative and qualitative analyses (Chapter 3), concentrating on the following:

- High-level metrics of the investment portfolio, including financing instruments, financing volume in U.S. dollar amounts, and regional distribution;
- Design of incentives, including types of entities addressed and indicators linked to specific results; and
- Results of the selected results-based SWM projects.

The report also consolidates key takeaways from the World Bank’s experience in design and implementation of results-based SWM projects (Chapter 4).



# 2

## Overview of the Results-Based Solid Waste Management Projects



## What Are Results-Based Solid Waste Management Projects?

Results-based SWM projects can be designed in various ways to cater to the specific needs of different countries. This section discusses the range of projects in the relevant investment portfolio along two dimensions: (i) *technical scope* and (ii) *scale of the RBF approach* used. See Figure 2.1.

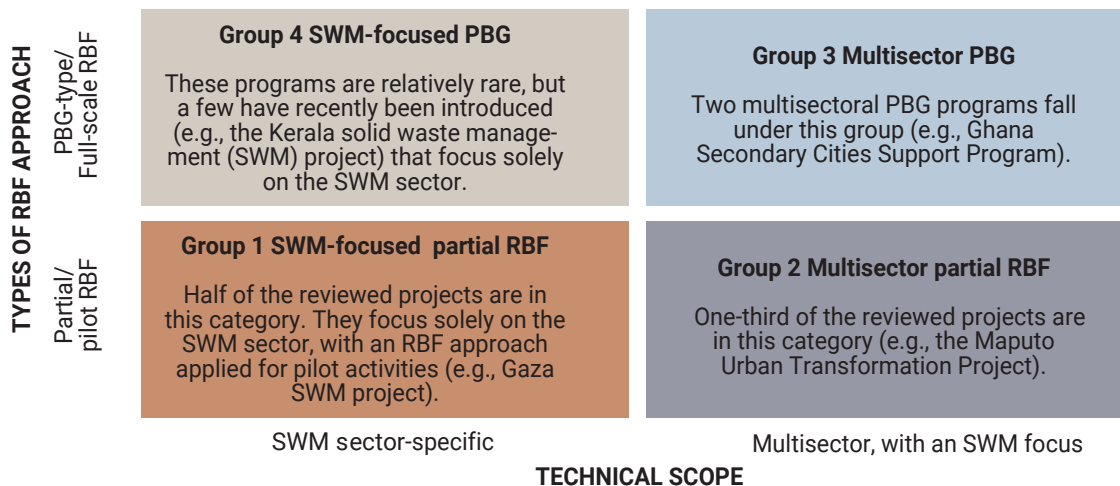
*The technical scope* of a results-based SWM project can be either sector-focused or multisectoral. A standalone SWM project often tackles challenges across the SWM value chain, ranging from collection, transportation, disposal, and processing, to institutional and financial arrangements. A multisectoral project, on the other hand, tends to include SWM activities that are relatively limited in scope as part of broader investment in urban infrastructure and services.

*The scale of the RBF approach* refers to whether the projects take the form of large-scale programs or small-scale pilots. The different RBF approaches taken by projects to achieve their objectives related to the SWM sector include the following:

- **Performance-based grants (PBGs).** A PBG is “a specific type of intergovernmental financing mechanism, whereby local and other subnational governments receive fiscal transfers (grants) from higher tiers of government, conditioned on their assessed performance in predetermined areas” (Lee et al. 2022). In use for more than twenty years, urban PBGs have gained recognition for enhancing the efficacy of local governments in various domains (Box 2.1). Three of the reviewed projects are designed as PBGs using the following Bank financing instruments:
  - *Program for Results (PforR).* Introduced in 2012 as a new financing instrument, a PforR disburses allocated funds of a government program upon the achievement of disbursement-linked indicators (DLIs) that monitor the results of the agreed-on performance targets. The PforR instrument relies on the government systems in place. While the Bank has a sizeable portfolio of PforRs, only two of the projects reviewed here utilize PforRs that include DLIs targeting improved SWM systems among comprehensive urban service performance indicators.
  - *Investment project financing (IPF).* The IPF is another financing instrument serving PBGs by triggering disbursements against the achievement of key performance indicators. The IPF instrument has benefits, especially for countries with weaker capacities, because it can help make up the deficiency by introducing Bank fiduciary and environmental and social safeguards systems. This review includes one project (the Kerala SWM project) under this category.
- **Inclusion of pilot RBF component(s) as part of an IPF.** In cases where the RBF approach is relatively new to a country or PBGs are deemed less relevant to its policy priorities or programs, a project can include one or more pilot RBF activities in the SWM sector, with the expectation of scaling up and refining them in the longer term. The design of this partial RBF approach can vary significantly, based on the financing volume of the RBF activities and the capacity and willingness of governments

**Figure 2.1**

**Types of Results-Based Solid Waste Management Projects Financed by the World Bank<sup>a</sup>**



Source: World Bank team.

Note: SWM = solid waste management; PBG = performance-based grant; RBF = results-based financing.

<sup>a</sup> Projects named in the figure include: Kerala SWM Project (P168633); Ghana Secondary Cities Support Program (P164451); Gaza SWM Project (P171328); Maputo Urban Transformation Project (P171449).

to implement reforms. The World Bank's GPRBA has provided relatively small results-based grants (between US\$3 million and US\$6 million each) to support pilot RBF components in larger input-based IPF projects. In Liberia, Nepal, and the West Bank, for example, the GPRBA grants sought to provide incentives for local governments to improve institutional and financing arrangements for the SWM sector.

Figure 2.1 breaks down the different types of results-based SWM projects along the two dimensions discussed above.

First, as Figure 2.1 indicates, the most prevalent type of RBF SWM project reviewed is an SWM-focused project that applies the RBF approach for relatively small pilot activities (Group 1). Half of the reviewed projects (nine) fall under this category. It is deemed suitable for countries and cities

where SWM enhancement is a strong policy priority, but the RBF approach is not yet familiar. In Gaza, Jamaica, Nepal, Ningbo, and the West Bank, for example, RBF approaches were used to pilot innovative activities on a small scale, yielding some positive results (see the section below).

Second, one-third of the reviewed projects applied the RBF approach for SWM activities as part of their multisectoral investments (Group 2). The Msimbazi Basin Development Project, for example, is designed to enhance flood resilience and promote integrated urban development within the Msimbazi river basin in Dar es Salaam. The project supports a performance-based, community-led SWM and litter control program as part of this broader objective.

Third, multisector PBG programs (Group 3) can include incentives for, and investments in, improvement in the SWM sector. The review identified



two multisector PBG programs that emphasize the enhancement of SWM outcomes as part of their broader objectives. The Ghana Secondary Cities Support Program, for example, is designed to enhance urban management and the provision of fundamental services in participating municipalities by providing PBGs contingent upon the municipalities' performance. Their performances are evaluated against a comprehensive set of

benchmarks for urban management and service delivery, including the delivery of SWM services.

Last, there are few SWM-focused PBG programs (Group 4). This type can be pursued where there is a strong interest in SWM enhancement and sufficient awareness of and willingness to utilize the full-scale RBF approach. One example is the Kerala SWM Project (loan of US\$105 million). It

## Box 2.1

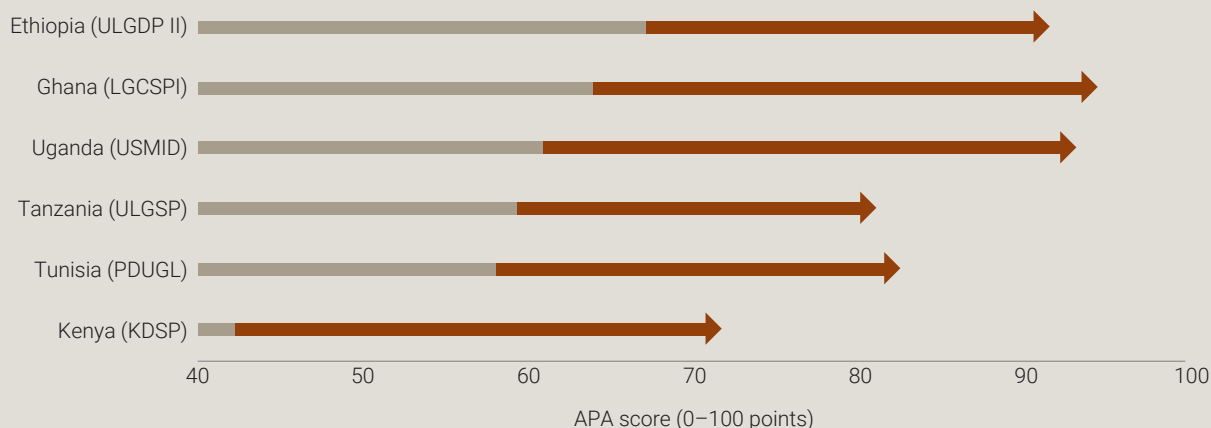
### Efficacy of Urban Performance-Based Grant Programs Financed by the World Bank

A review of eighteen urban performance-based grants (PBGs) financed by the World Bank between 2013 and 2020 showed that the programs helped enhance the overall institutional capacity of the participating municipalities. A key metric was the average score for each municipality of annual performance assessments conducted over the program period, including specific performance indicators related to institutional and capital investment activities. The review indicated an average increase in annual performance assessment scores by as much as 50 percent (Figure B2.1.1).

The review also found a significant increase in own-source revenue (OSR) among the participating municipalities over the program period (Figure B2.1.2). It suggested that the impetus for these improvements was well-designed, performance-based financial incentives triggering changes to institutional and financial mechanisms, complemented by targeted capacity-building support extended before and during the implementation phase.

**Figure B2.1.1**

#### Increase in Average Score of Annual Performance Assessments over Program Period for All Local Governments in PBG Programs



*(continued on next page)*

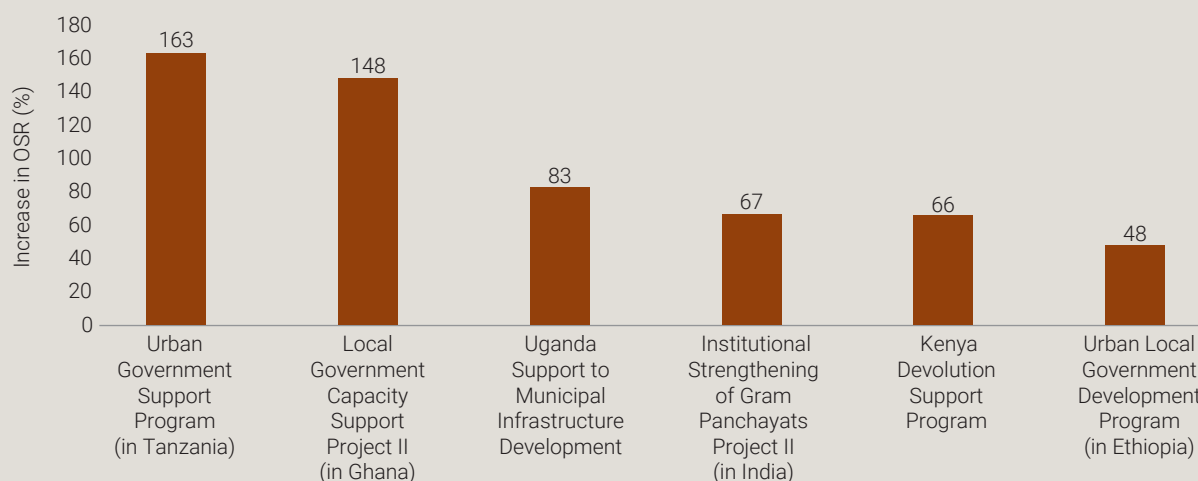


## Box 2.1

### Efficacy of Urban Performance-Based Grant Programs Financed by the World Bank *(cont.)*

**Figure B2.1.2**

**Percentage Increase in Own-Source Revenue over Program Period**



Source: Lee et al. 2022.

provides formula-based incentive grants tied to key conditions, with incentives to strengthen the institutional capacities of urban local governments to plan, implement, and manage SWM systems (World Bank 2021d). A new project that takes a similar approach to the Kerala SWM project is under preparation in Indonesia<sup>3</sup> (approximately US\$350 million committed as of March 2024).

### Evolution of the Results-Based Solid Waste Management Portfolio

The World Bank's results-based SWM portfolio has gradually grown—between 2012 and 2024, 19 new projects have been approved (Figure 2.2). Five projects were approved between 2012 and

2014, two of which were GRPBA-funded grants (US\$8.34 million in total). These two grants were introduced as pilots to test out the feasibility and applicability of results-based grants in the SWM sector, which historically had lacked financial sustainability.

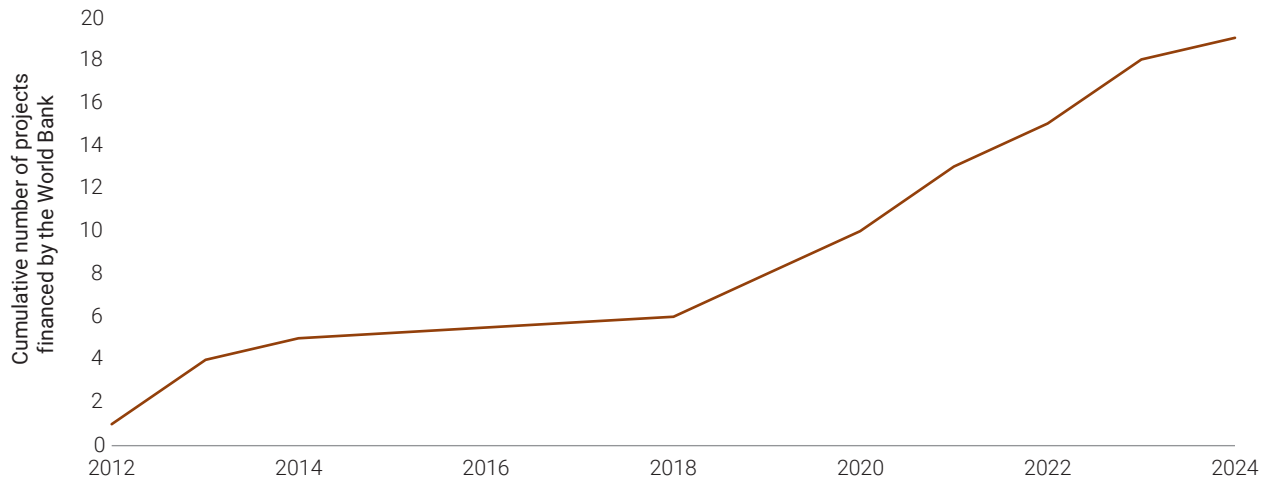
The geographic distribution of the projects has expanded over time (Figure 2.3). Pioneering RBF activities took place in the Middle East and North Africa and East Asia and Pacific regions, but the portfolio has grown in Sub-Saharan Africa since 2018. The East Asia and Pacific and Sub-Saharan Africa regions together account for approximately

<sup>3</sup> Indonesia Local Service Delivery Improvement Project (P180270).



**Figure 2.2**

**Cumulative Number of Results-Based Solid Waste Management Projects Financed by the World Bank between 2012–2024**



Note: The projects are counted based on year of approval.

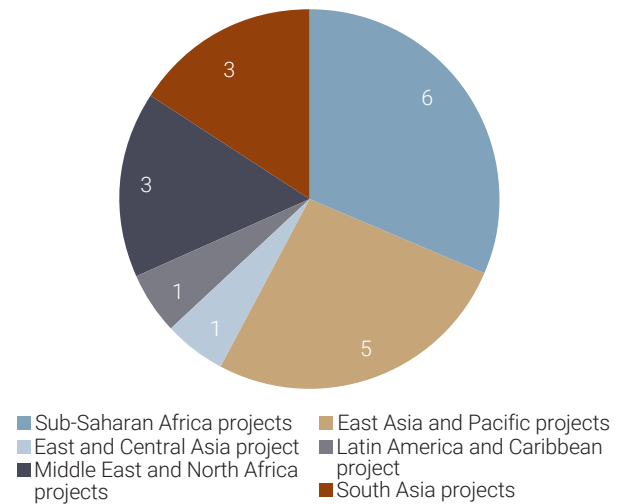
two-thirds of the results-based SWM portfolio. A smaller share is spread across South Asia, the Middle East and North Africa, Latin America and the Caribbean, and Europe and Central Asia.

Within these regions, the top five countries are China, with three projects, and Ghana, India, and Tanzania, with two each.

While the geographical distribution of the results-based SWM projects largely mirrors that of the World Bank’s urban lending portfolio, the East Asia and Pacific region is notably overrepresented relative to the overall portfolio. This is primarily due to the presence of three distinct results-based SWM projects in China.

**Figure 2.3**

**Regional Distribution of Results-Based Solid Waste Management Projects**





3

**Key Findings**



As discussed in the previous chapters, key challenges to enhancing SWM systems can be categorized into four focus areas:

- **Enhancement of the SWM infrastructure and services:** Waste collection and transportation; waste processing and disposal; waste segregation and recycling
- **Institutional strengthening:** Planning system; regulations; capacity-building activities
- **Financial sustainability:** Cost reduction by improving efficiency of the SWM service; revenue collection
- **Social inclusion:** Female participation; inclusion of the informal sector

To effectively address the SWM challenges, results-based SWM projects are designed with several unique features: (i) financial incentives linked to achievement of agreed-upon result indicators; (ii) institutional arrangement with municipalities as the main implementing agencies in most cases; and (iii) the performance monitoring and verification system involving an IVA to monitor performance and verify results—bringing credibility to implementing institutions and fostering stakeholder trust.

Overall, the review found that the performance-linked incentives effectively motivate municipalities (and other agencies and service providers) to address targeted issues and enhance the SWM system; result details are provided in the following sections.

## Design of the Results-Based Solid Waste Management Projects

The following sections analyze three elements of results-based SWM project designs, including (i) focus areas of performance indicators, (ii) institutional arrangements, and (iii) the performance monitoring and verification system.

### *Financial Incentives: Focus Areas of Performance Indicators*

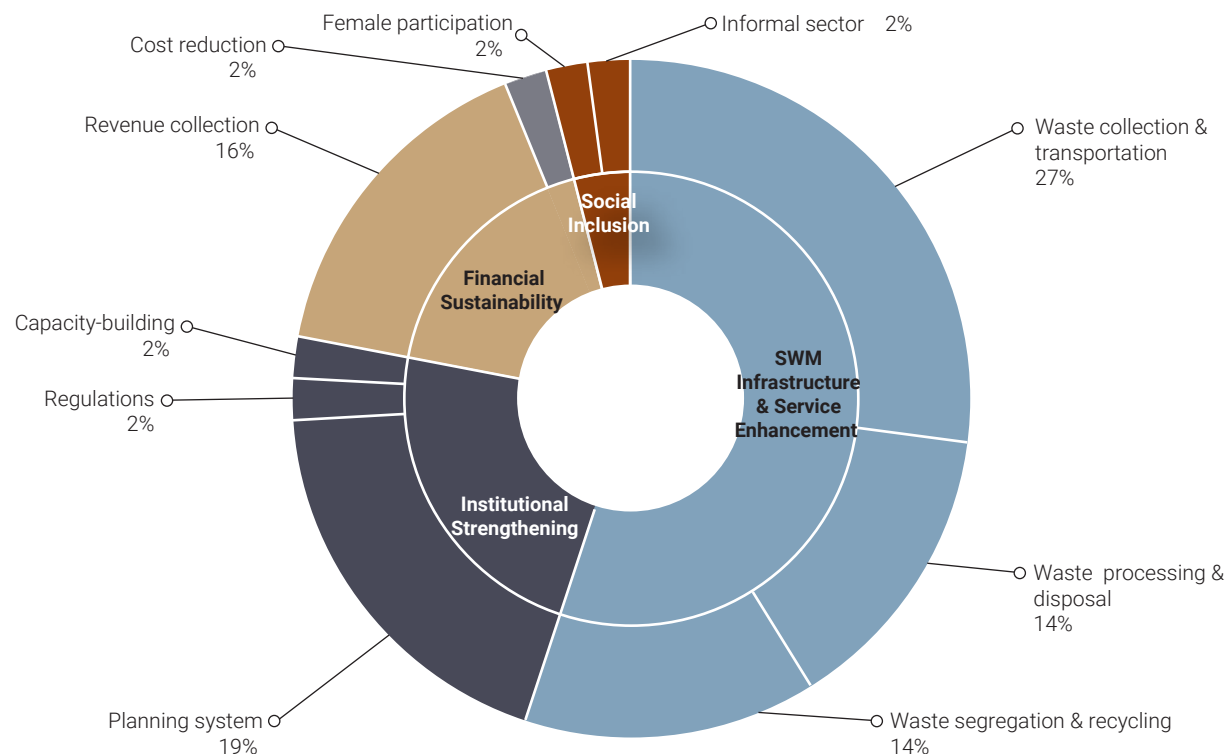
Results-based SWM projects entail financial incentives by linking payments to the achievement of agreed-upon result indicators. Establishing adequate incentives for implementing entities, therefore, requires specific indicators targeting prioritized interventions in a city or country. The following section analyzes the focus areas and designs of such result indicators. Another pre-requisite for successful RBF designs is setting appropriately sized financial incentives. Financial incentives should be carefully priced according to key factors, such as actual costs of SWM infrastructure and services, revenues collected from users, and financial capacities of implementing entities. Further discussion on pricing RBF is beyond the scope of this report and requires future research given the currently limited pricing data available across a wide range of RBF approaches.<sup>4</sup>

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<sup>4</sup> Some of the project examples touch upon pricing aspects to some extent. The Bank's recent publication on performance-based grants (Lee, et al. 2022).



**Figure 3.1**  
**Performance Categories for Results-Based Solid Waste Management Projects**



The review found that of the 62 indicators identified,<sup>5</sup> over half (35) target improvement in SWM infrastructure and services, while 14 (22 percent) focus on institutional strengthening (Figure 3.1). The remaining indicators contribute to financial sustainability, mainly by providing municipalities (or other service providers) with incentive to increase fee collection and reduce costs. See Annex A for a list of all the identified performance indicators in the reviewed SWM RBF projects.

### **Enhancement of the SWM Infrastructure and Services**

**Waste collection and transportation** indicators are the most prevalent among the performance

categories, accounting for 17 of the 62 indicators. They are used primarily to evaluate the quantity, coverage, and frequency of waste collection activities. Some examples include the following:

- *Quantity:* Increase in the quantity of waste collected and disposed of at SWM facilities (tonnes per capita); waste collected from the targeted communities and disposed of at

<sup>5</sup> Indicators are set at the project approval stage. Active projects may have their indicators adjusted if they experience restructuring at any point during implementation. For a results-based SWM project that aggregates indicators into a scorecard or consolidated index, categorization is based on the predominant theme of the scorecard or index. See below for the design of performance monitoring tools.



formal waste collection locations or waste transfer stations (in metric tonnes)

- *Coverage*: Percentage of households or number of people with access to regular solid waste collection services
- *Frequency*: Proportion of collection locations cleared completely each week; average time waste is stored at the transfer station before landfill disposal

Some projects group these indicators in a scorecard or use a cleanliness index to evaluate overall improvement in the basic SWM services in neighborhoods. The West Bank SWM project, for example, introduced a cleanliness index<sup>6</sup> that served as a proxy indicator for the effectiveness of the primary waste collection service. The index assigned scores based on visual inspections of designated areas.

**Waste processing and disposal** indicators are used to improve the effectiveness of waste management at transfer centers or landfills. Nine indicators have been identified across four projects. Examples include the following:

- *Management of a sanitary landfill*: Increase in the percentage of sanitarily managed waste out of total generated waste; percentage of proper compaction and covering of incoming waste at a landfill; regular environmental monitoring and reporting; regular cleaning of areas surrounding the landfill, access roads, and adjacent communities. All such procedures are presented in a set of standard operating procedures (SOPs) for landfills.
- *Functional transfer centers*: Number of transfer stations constructed and maintained; percent-

age of waste received at transfer stations that is transferred to landfills; maximum duration that collected waste remains onsite before disposal to a landfill; organization of and improvement in cleanliness of transfer station facilities.

- *Adequate treatment of different types of waste*: The performance of hospitals, clinics, and non-governmental organizations (NGOs) that are responsible for the proper separation of medical waste; their compliance with established medical waste handling procedures; and level of source separation for infectious waste. Discounts and/or credits are provided to health care institutions based on the quality of separation and compliance with packaging and containment procedures for waste collection.

**Waste segregating and recycling** indicators intend to encourage sustainable SWM practices and contribute to circular economy. The review identified nine of these indicators, including:

- *Waste separation practice at source*: How well recyclables and organics are being separated; the cleanliness of the community and the area around dumpsters. These are assessed using a solid waste separation scorecard for participating communities, with the evaluation criteria and guidelines established by community stakeholders.
- *Volume of waste reused or recycled*: Increase in the volume of materials (measured in

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<sup>6</sup> The cleanliness index score calculation included four variables: presence of waste on streets, utilization of bins, physical condition of bins, and accumulation of waste. The index assigned scores based on visual inspections of designated areas. Areas with no visible refuse on the streets, for instance, received an "A" grade.



tonnes per day) recovered or recycled from dry waste in specific zones.

- *Compliance with environmental standards:* Verified use of standard or thicker ground plastic film by farmers and cooperatives, in compliance with relevant standards; collection of used plastic from farmland and its placement at designated collection points to reduce the environmental impact of plastic waste.

In the long run, improved waste separation and recycling can significantly contribute to waste reduction, resulting, in turn, in reduced greenhouse gas emissions and pollution.

### ***Institutional Strengthening***

In principle, the objective of the RBF approach is to strengthen institutional capacity in overall sector performance by providing incentives to governments and service providers to make improvements. In this section, discussion of the scope of institutional strengthening is limited to the development of planning and monitoring systems, the establishment of regulations, and the conducting of capacity-building activities. The review identified fourteen indicators targeting these areas, as follows:

- *Planning:* Preparing a five-year, citywide plan for climate-smart and disaster-resilient SWM; the development of plans for levying user charges and for operation and maintenance (O&M) budgeting.
- *Regulations:* The issuance of SWM bylaws that incorporate the principles of the government's new waste management strategy. This ensures local regulations align with national

policies and promote consistent waste management practices. Such regulations pertain to technical issues as well as financial ones.

- *Capacity-building activities:* Conducting awareness campaigns for residents; providing on-the-job training; hiring qualified personnel within the waste management organizational structure; operationalizing a management information system for SWM.

Some projects provide incentive to apply performance-based contracts between the public and private sectors to improve oversight of SWM service quality. This approach has been introduced in Kerala and will be introduced in Indonesia. In Kerala, local governments are given incentive to sign performance-based contracts for waste collection and transportation services between local governments and private service providers as part of the project's comprehensive institutional-strengthening activities (Box 3.1). Similarly, in Indonesia, a proposed project with US\$350M in committed funding as of March 2024 uses PBGs to incentivize local governments to improve their SWM policies and establish performance-based contracts with SWM service providers (Box 3.2).

### ***Financial Sustainability***

Investments in, and the operation of, SWM systems are costly, so establishing a sustainable financial mechanism is necessary for improving and maintaining SWM infrastructure and services in the long term. Results-based SWM projects are, therefore, often designed to improve the financial health of SWM systems. Eleven indicators were identified to improve the financial sustainability of SWM services and infrastructure.



### Box 3.1

#### The Kerala Solid Waste Management Project

The solid waste management project in Kerala supports urban local governments by providing incentive grants for implementing crucial institutional reforms and investments that bolster their capacity to manage solid waste effectively. Covering 93 urban local governments across Kerala's 14 districts, the project affects over 7.5 million residents.

The urban local governments become eligible for these grants by meeting three conditions:

1. Crafting a five-year, citywide plan for climate-smart, disaster-resilient SWM
2. Enacting SWM bylaws in line with Kerala's new SWM strategy
3. Securing access to a facility for the safe disposal of waste

Additional grants are awarded when the governments meet four more criteria:

1. Hiring two top-level staff members, according to the SWM organizational structure approved by the state government
2. Signing performance-based contracts for waste collection and transportation
3. Devising a plan for user charge levies and operations and O&M budgeting
4. Establishing a monitoring and evaluation (M&E) system, including a grievance redressal mechanism

The activities financed by these grants are identified in the local governments' five-year SWM plans, which are prepared at the project's onset and validated annually in their development plans.

### Box 3.2

#### Indonesia Local Service Delivery Improvement Project

In 2000, the Government of Indonesia decentralized authority, political power, and financial resources directly to local governments, making them responsible for delivering key services and basic infrastructure including solid waste collection, transport, recycling, and disposal. The process is still incomplete, with evident gaps in the capacity of the local governments to deliver quality SWM services and infrastructure. Furthermore, implementation is hampered by a lack of behavioral change incentives for both waste generators and waste collectors, as well as a lack of sanctions/penalties for non-compliance.

This US\$350M project in the pipeline seeks to build financial and institutional capacities for improving SWM services in 25–45 local governments in Indonesia. The project's two-pronged approach involves national level reforms and capacity building performance-based grants (PBGs) for participating local governments. The PBGs will incentivize local governments' institutional reforms through extrabudgetary fiscal transfers to improve coverage and quality of SWM local services, particularly upstream activities for waste minimization and waste segregation. The PBGs can finance both capital and operational expenses linked to the SWM plans of local governments.

The size of PBGs is designed to provide local governments with sufficient funding to take meaningful policy actions and interventions in SWM. Factors which determined the size of the PBGs include: (i) size of other funding sources (e.g., OSR, intergovernmental fiscal transfers, and other sources); (ii) costs of typical interventions and services at the local level; (iii) local governments' absorption capacity; and (iv) needed size to provide performance improvement incentives.

The resulting average grant size is set between US\$15–16 per capita (or US\$3.8 per capita per year on average). This is equal to about 10 percent of local governments' current annual total per capita capital investments or 3–4 percent of the total central government grants (all sectors) to local governments. It will typically add around 100–150 percent additional funds to the current SWM expenditure level observed in sample local governments and will fill a substantial gap in terms of the expenditure needs for the sector.

*Source:* World Bank. 2024. "Project Appraisal Document: Indonesia Local Service Delivery Improvement Project (P180270)".



- *Cost reduction:* Reduction in the cost per kilogram of waste treated.
- *Revenue collection:* Increase in the billing-to-cost ratio, measured by the extent to which operating costs are covered by fees collected from waste services. In this case, an IVA is tasked to review municipal financial accounts to analyze revenues, expenditures, and operating margin.

An example of a revenue collection KPI introduced by the Cheesemanburg Landfill and Urban Sanitation project in Liberia assesses increases in tipping fees from private sector entities, including community-based enterprises involved in primary waste collection and small- to medium-sized enterprises that manage waste for commercial clients. The target is the establishment of a fee structure that more accurately reflects the cost of commercial waste disposal, thereby ensuring a fair and economically sustainable revenue stream for SWM services.

### **Social Inclusion**

Recognition of the need for social inclusion within the SWM value chain is growing, particularly in terms of enhancing female engagement and considering the impact of system changes on livelihoods in the informal sector. This recognition opens an opportunity to support sustainable employment and promote equitable economic progress. Results-based SWM projects could play a role in achieving this, but the review identified only two indicators specific to this goal:

- *Formalizing informal waste pickers:* Training waste pickers at a dumpsite; organizing

waste pickers into cooperatives; participation of waste pickers in composting and recycling

- *Gender inclusion:* Proportion of women trained and appointed to technical or leadership roles within service provider organizations

### **Institutional Arrangement**

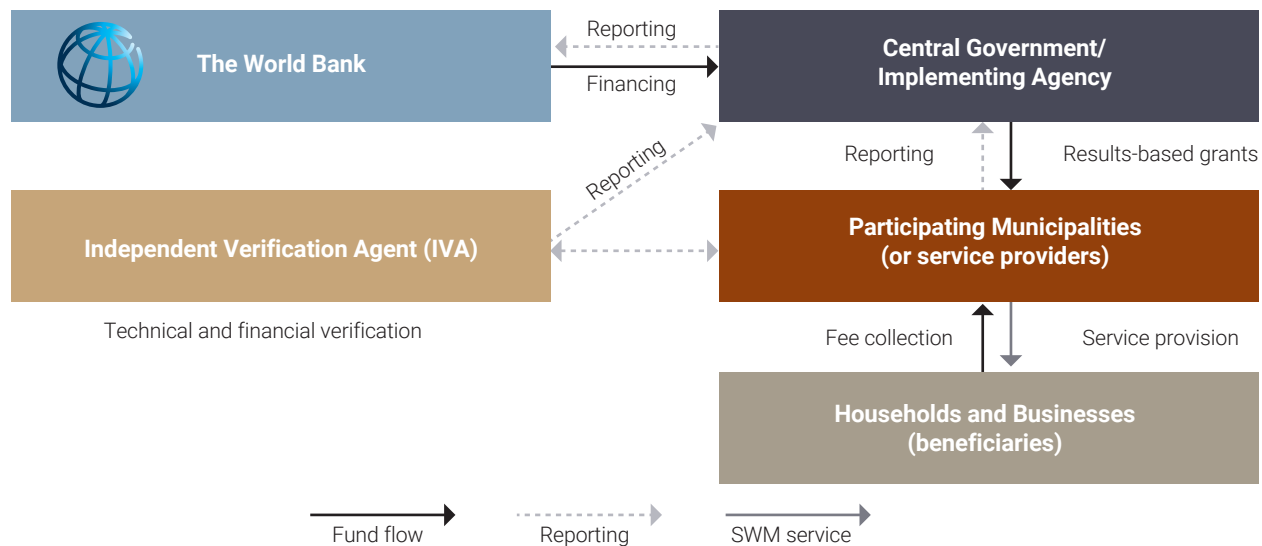
The institutional framework for results-based SWM projects involves collaboration among key stakeholders, typically including municipalities, relevant national or regional government bodies and agencies, the World Bank, IVAs, and the direct beneficiaries. Figure 3.2 illustrates a common institutional arrangement for a results-based SWM project.

A national agency—usually the Ministry of Finance—or regional agencies receive funding from the World Bank for results-based SWM projects. These agencies then allocate funds to participating local governments and/or service providers based on verified results. They are also responsible for overall project management and oversight, with technical support from the Bank.

The recipients of the results-based funding can be municipalities, other public service providers, or communities. In most cases, results-based SWM projects are designed to provide financial incentives directly to participating municipalities. Of the 62 indicators identified in the results-based SWM projects reviewed here, 47 (67 percent) target municipalities. This is because municipalities have the primary responsibility for providing SWM services. An example of a nonmunicipal public service provider receiving incentives from a results-based SWM project is the City Cleaning Investment Fund



**Figure 3.2**  
**Common Institutional Arrangement for Results-Based SWM Projects**



(CCIF) in Yemen, an independent public sector entity that offers SWM services. Within communities, neighborhood groups<sup>7</sup> can receive incentives to drive grassroots initiatives and motivate households to engage in sustainable waste segregation practices, as seen in Jamaica (Box 3.3).

In FCV contexts where government presence is minimal or lacks capacity, intermediate agencies can be engaged. The Municipal Development and Lending Fund (MDLF) in Gaza and the United Nations Office for Project Services (UNOPS) in Yemen, for instance, have been involved in project implementation. This approach has its advantages and disadvantages. In the case of the Gaza project, MDLF's strong capacity as a national agency played a crucial role in effectively addressing pertinent challenges. On the other hand, its participation limited the potential for enhancing the capabilities of participating municipalities.

In scenarios with such intermediaries, the priority should remain to graduate the project from the intermediary arrangement and strengthen the direct actors ultimately responsible for the sector management. This shift is essential for sustaining project impacts, as overreliance on intermediaries may result in continued underdevelopment of local institutional capacities.

Another vital actor in the results-based SWM projects is the IVA. The IVA is typically hired by the national or regional agency in charge of program management to monitor and assess the performance of participating municipalities. The next section provides details about the role of the IVA in performance monitoring and verification.

<sup>7</sup>For the purposes of this classification, farmers' cooperatives and enterprises, village committees, and direct beneficiaries are collectively grouped under the category of neighborhood groups.



### Box 3.3

#### National- and Local-Level Incentives for Better SWM Services in Jamaica

The Jamaica Integrated Community Development Project aimed to prioritize community improvements, including enhancing the cleanliness of neighborhoods. At the national level, the project incentivized the National SWM Authority to improve basic SWM services—for instance, by providing more comprehensive and regular waste collection and installing more containers for solid waste. The incentive offered to the authority was the provision of additional waste collection trucks once it achieved a predetermined level of services.

At the community level, the project encouraged community-based organizations (CBOs) and environmental wardens to improve the effectiveness of waste separation and improve the cleanliness of the community and its surroundings by installing approximately 5,000 residual waste bins, 55 dumpsters, 30 recycling enclosures, and 30 composting bins.

Additionally, 165 environmental wardens were hired and trained to improve community cleanliness. They worked with CBOs to bring about behavioral change in the communities, with the authority to oversee, enforce, and assist with waste management activities. They encouraged residents to stop littering, for instance, maintained waste bins and community areas, and coordinated cleanup activities.

The environmental wardens and CBOs received quarterly and biannual financial bonuses, respectively, if the community met qualitative cleanliness targets. To ensure accountability, an IVA randomly assessed and verified the cleanliness of community areas. By project closure, wardens and CBOs had earned a total of US\$12,000 in monetary bonuses. As a result of their efforts, the intervention had a significant impact on community perceptions of solid waste, with approximately 95 percent of participating communities achieving their targets.

Source: World Bank 2023a.

### Performance Monitoring and Verification System

Implementation experience from the World Bank–financed RBF programs in general has highlighted the importance of a credible performance monitoring and verification system in providing adequate economic incentives to municipalities and strengthening trust among stakeholders (Lee et al. 2022). This system comprises two steps: first, data collection and reporting by an IVA on the performance of targeted entities against the agreed-upon indicators and, second, a two-layer verification of the results by the government implementing agency and the Bank team.<sup>8</sup> The verified results then inform the disbursement of funding to the targeted entities.

Figure 3.3 shows a pathway to strengthen the credibility of performance assessment and verification for a results-based SWM project. The review found that thirteen of the nineteen projects (72 percent) hired an IVA for performance assessment and established a quality assurance system<sup>9</sup> (that is, Groups 3 or 4 in Figure 3.3).<sup>10</sup>

<sup>8</sup> See more details about the verification system of the World Bank–financed performance-based grant programs in the recently published report by Lee et al. (2022).

<sup>9</sup> It should be noted that information for three projects was not available, which may affect the overall percentage once these projects are completed and reviewed.

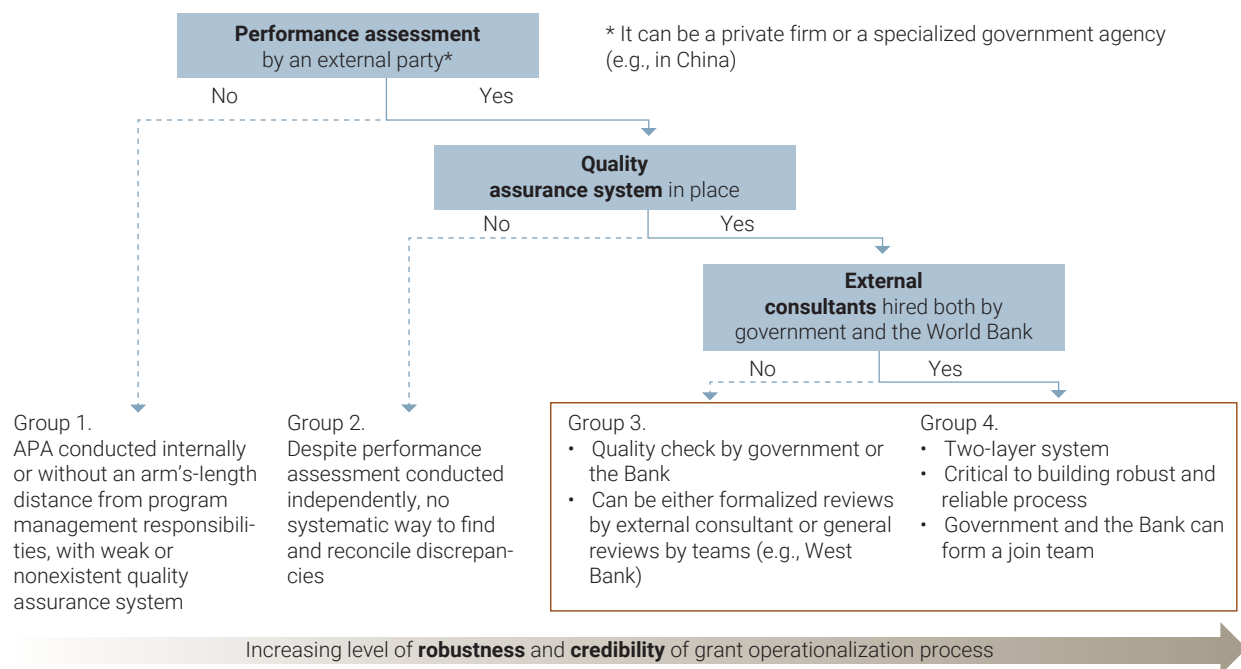
<sup>10</sup> These group numbers are distinct from those in Figure 2.1.



The results-based SWM projects, like other RBF programs financed by the Bank, engage IVAs to assess and validate the performance of participating municipalities or relevant entities against established indicators. The appointment of an IVA, an impartial third-party evaluator uninvolved in the disbursement procedures of the project, is crucial for reinforcing a clear delineation of duties among involved parties and ensuring that assessments are carried out promptly and effectively. The IVA is also tasked with guiding and making recommendations to provide incentive to entities on how further to improve their performances and meet the agreed-on targets. Box 3.4 presents an example provided by the Nepal SWM project of a performance monitoring and verification process with IVAs.

While performance assessment and verification by an IVA is recommended, other approaches have been utilized in certain cases. In the China Plastic Waste Reduction Project, for instance, the Solid Waste Separation Guiding Center, which is one of the project implementation units responsible for policy, technical assistance, and capacity-building activities, has been entrusted with reviewing and confirming the data for the output-based component. Similar arrangements were employed in the Ningbo municipal solid waste minimization and recycling project, in which the Ningbo Domestic Solid Waste Separation Project Management Office, housed within the City Administration Bureau, was responsible for collecting the necessary data for the implementation and verification

**Figure 3.3**  
Options to Improve Credibility of the Performance Assessment



Source: Modified from Lee et al. (2022).

Note: These group classifications and numbers are distinct from those in Figure 2.1.

### Box 3.4

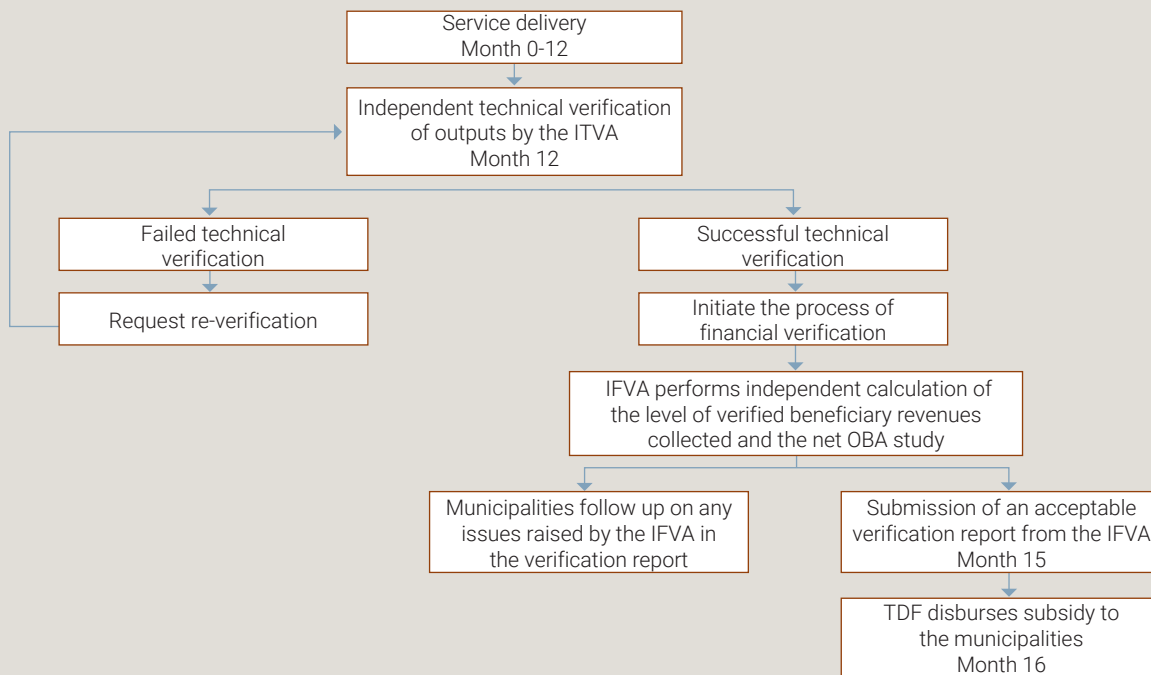
## The Performance Monitoring and Verification Process of the Nepal SWM Project

The objective of the Nepal Output-Based Aid for SWM project was to enhance the provision of high-quality and financially sustainable SWM services in five secondary cities in Nepal, namely Dhankuta, Ghorahi, Lalitpur, Pokhara, and Tansen. The project implemented a two-part verification mechanism using independent consultants. In the first phase, an independent technical verification agent (ITVA) was deployed to conduct quarterly reviews of municipality performance. These assessed adherence to the technical and service delivery standards outlined in a predetermined scorecard, which served as a performance management tool and played a central role in project management and evaluation. Municipalities became eligible for subsidies once they achieved a minimum passing score. Any municipality that failed to meet the passing score was given an opportunity to revise its practices and request re-scoring up to three times before exiting the project.

In the second phase, after the ITVA determined that services were satisfactory, an independent financial verification agent (IFVA) was engaged. That agent's responsibilities included verifying the monthly beneficiary revenue collected, independently calculating the subsidy to be paid, and assessing the municipality's financial management system for SWM expenditures and revenues. Upon completion of that verification process, the resulting service delivery grants were directly disbursed to the municipality's SWM account. Figure B3.4.1 illustrates how this process works.

While the two-step verification system implemented by the Nepal project was successful, this method is not universally advisable. It can be considered when there is a professional firm available and equipped to per-

**Figure B3.4.1.**  
**Illustration of Verification Process**



Note: OBA: Output Based Aid; TDF: Town Development Fund.

*(continued on next page)*



### Box 3.4

#### The Performance Monitoring and Verification Process of the Nepal SWM Project *(cont.)*

form both extensive technical and financial verifications. The Nepal project was distinct in its reliance on individual consultants for verification, which necessitates a division of tasks as the most suitable strategy. The engagement of two separate experts or firms requires additional effort and cost, and the process takes longer because of the time they must invest in understanding and thoroughly reviewing the verification process. Despite these challenges, this approach has the advantage of providing a more comprehensive verification that reduces the likelihood of manipulation in the verification process. Consequently, careful consideration is warranted when deciding on the implementation of such an approach to verification.

*Source:* World Bank. 2018c.

of the output-based incentive payment program. Such alternatives can be considered in more sophisticated settings where programs have a well-established implementation history, provided adequate measures for quality assurance are in place and efforts are made to minimize conflicts of interest (Lee et al. 2022).

services. Addressing these predominantly technical challenges is crucial, as they are among the main impediments to effective waste management by municipalities. These investments typically encompass improvements in waste collection and transportation, waste processing and disposal, as well as waste segregation and recycling.

### Impacts of the Results-Based SWM Projects

Assessment of the results of the results-based SWM projects is somewhat limited, given that most of those reviewed in this report started only after 2019. Nevertheless, the projects have, overall, yielded positive outcomes. This section introduces the achievements and challenges observed among the nine projects that have been completed and/or have publicly available results.

#### *Enhancement of SWM Infrastructure and Services*

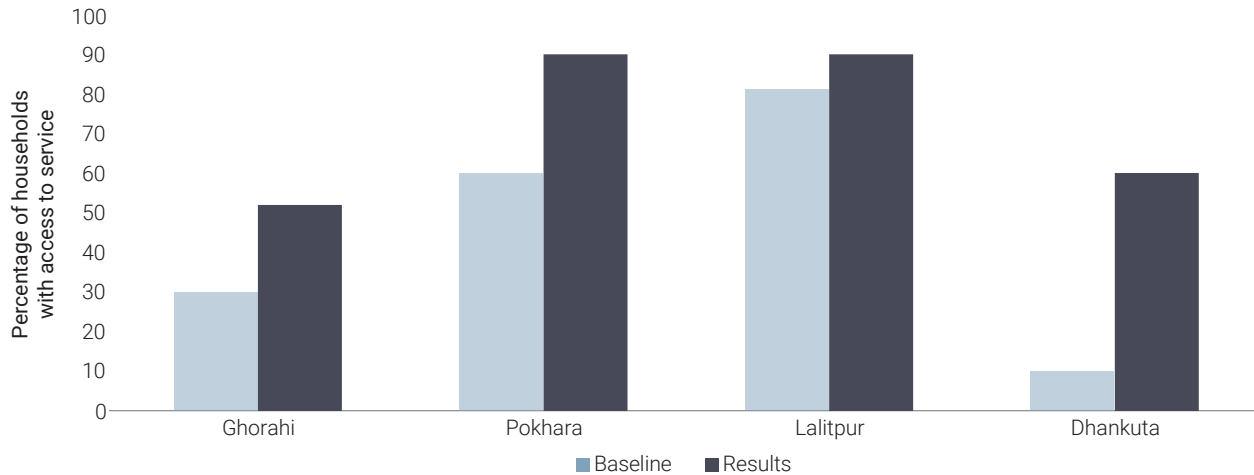
The primary objective of most investments in SWM is the enhancement of infrastructure and

#### *Waste Collection and Transportation*

In LMICs, where institutional and financial constraints often limit provision of adequate infrastructure and services, RBF can be a strategic approach to fulfilling the basic collection and transportation of municipal solid wastes. In the case of the Nepal SWM project, all participating municipalities enhanced their SWM services and expanded waste collection to more households over the project implementation between 2013 and 2017. By the project's conclusion, approximately 120,000 households had benefited, and municipalities raised the average waste collection service coverage to about 70 percent (see Figure 3.4). In fact, the improvements in SWM systems received national recognition. In 2017, Dhankuta, one of the participating municipalities, received an award for being the "Cleanest Municipality



**Figure 3.4**  
**Increase in Households with Access to Waste Collection Service in Nepal**



Source: World Bank 2023a.

in Nepal” (World Bank 2023a). The project’s well-defined targets, specific timeline, and strict monitoring and evaluation framework provided municipalities with clear guidance and direction (Lypiridis and Khan 2022).

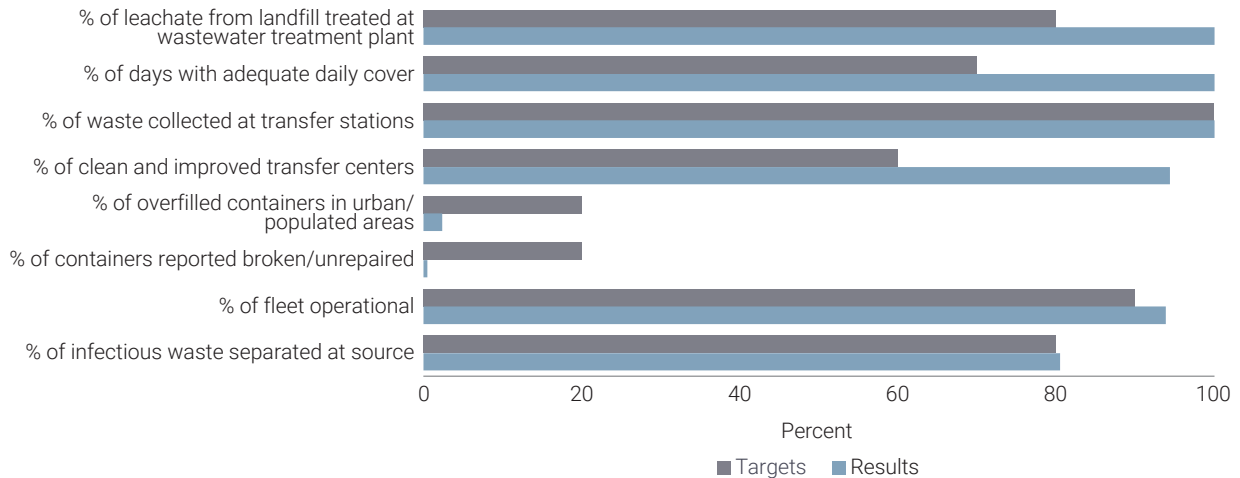
In the West Bank project, the Hebron and Bethlehem governorates achieved improvements in waste collection and transportation, meeting and surpassing the target of a 78 percent cleanliness index<sup>11</sup> score. Specifically, local governments in the Hebron Governorate saw a 25 percent increase in their average cleanliness index, while Bethlehem Governorate achieved a 28.6 percent rise. These enhancements were attributed to more consistent and frequent residential waste collection and the daily operation of mechanical street cleaning, along with improved maintenance practices, such as periodic washing of waste containers and better upkeep of trucks to prevent leachate leakage (World Bank 2018c).

Similarly, a project in Liberia has improved waste collection services, fostered community engagement, and shifted behavioral attitudes in two cities. Notably, the number of CBOs involved in the waste collection service has increased from 60 to 150. In addition, almost 150 low-income communities have participated in a cleanliness competition, which was designed to provide monetary rewards to those that met the agreed-on cleanliness targets. The 24 winning communities—encompassing over 530,000 residents (43 percent of whom are women)—have reaped or are anticipated to reap benefits from the community cleanliness awards amounting to US\$5,000 each. These efforts have substantially contributed to the achievements observed thus far. The volume of waste collected and disposed

<sup>11</sup> The assessment of street cleanliness in the West Bank project is based on a Cleanliness Index, which incorporates factors such as the presence of waste on streets, the use of bins, and the physical condition of these bins.



**Figure 3.5**  
**Improvement in Waste Processing and Disposal in Gaza**



Source: Pillars & Enfra Consulting 2022.

of in the two cities has surged to 692,000 tonnes, surpassing the initial target of 480,000 tonnes by 144 percent. Additionally, approximately 642,110 individuals (26 percent women) in urban locales now have access to consistent daily solid waste collection services (DT Global 2023).

### **Waste Processing and Disposal**

The RBF approach can also improve waste processing and disposal at landfills and transfer stations. In Gaza, unregulated landfills and clandestine dumpsites were contaminating the aquifer with leachate, posing serious health and safety risks to the local population. A project in Gaza provided transitional support to the JSC<sup>12</sup> to cover the costs of diverting waste from unregulated dumping sites and enhance the management of new landfill and transfer stations through activities such as updating operational standards and procedures. The project's grant transfer success-

fully bridged the JSC's financing shortfall caused by the increased O&M costs associated with construction of a new landfill.

As a result, an estimated 641,540 tonnes of waste were diverted from unregulated dumping to the sanitary landfill from 2019 to 2022 during the project implementation. Additionally, the IVA confirmed that the operators were fully compliant with all the procedures outlined in SOPs related to medical waste handling protocols. The average score for clinics, in terms of the proportion of infectious waste correctly disposed of in designated bins, was 80.45 percent, marginally surpassing the minimum threshold of 80 percent (Pillars & Enfra Consulting 2022) (see Figure 3.5).

<sup>12</sup> Joint Service Councils (JSCs) comprise multiple local governments and are tasked with delivering waste collection and transfer services across their designated service areas.



Similarly, the project in the West Bank contributed to stopping illegal dumping and ensuring sanitary management of all collected waste. To meet the project's objectives, local governments allocated funds from their own budgets to procure supplementary equipment, including 2,300 waste containers that were distributed to communities. This action not only facilitated the achievement of waste management targets, it fostered community involvement and strengthened the relationship between communities and local authorities (World Bank 2018c).

### ***Waste Segregation and Recycling***

Experience has demonstrated that, under certain conditions, incentive schemes can effectively drive behavioral change among residents, particularly in the area of waste segregation and recycling (World Bank 2023a). A prime illustration is the Ningbo Municipal Solid Waste Minimization and Recycling Project, which introduced a system of results-based incentive payments to enhance the investments in residential separation and collection equipment, transfer stations, and collection vehicles. This initiative successfully motivated residents to separate their waste, thereby enhancing the sustainability of waste disposal practices. The incentive system rewarded Neighborhood Resident Committees when residents actively participated and effectively separated their waste. Additionally, it provided comprehensive training for government staff at various levels in waste minimization and municipal SWM. An evaluation of the quality and thoroughness of waste separation found the project exceeded the target for recycling material. The total amount of separated kitchen waste collected reached 193,200

tonnes per year, exceeding the target by 130 percent and demonstrating the effectiveness of this community-focused approach. The proportion of residential waste separated increased by 17.54 percent (World Bank 2020d).

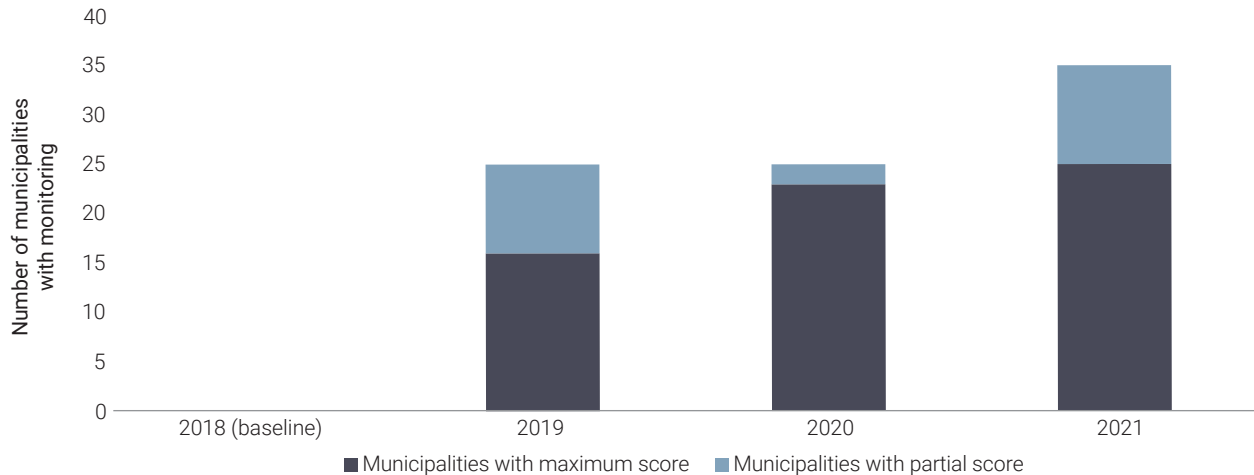
The incentive payments, which rewarded collective efforts rather than individual actions, was particularly effective in Ningbo's high-density urban setting. Although the participation rate was initially low, it gained traction, and communities reinvested the incentives in local beautification efforts. The program's popularity grew with the help of widespread campaigns that educated the public about the environmental benefits of sorting and recycling waste. As a testament to the value of the project's community focus, the Ningbo government decided to continue the programming after the initial World Bank-funded project ended. While Ningbo's case illustrates that well-designed incentives can lead to proper waste management and separation, and that those efforts can be maintained even after the project ends, creating such incentives requires a deep understanding of the local context, the costs involved, and what drives people to change their behavior (World Bank 2020d).

### ***Institutional Strengthening***

The common objective of large-scale RBF approaches (PBG-type programs) is to enhance institutional systems for the SWM sector. Financial incentives for such projects are fully integrated into existing government systems, which allows the projects to pursue large-scale institutional reforms and/or develop functional municipal SWM



**Figure 3.6**  
**Increased Performance of Municipalities with SWM Monitoring in Ghana**



Source: Maple Consult 2024.

Note: The total number of participating municipalities increased in 2021. The score is evaluated against the following criteria: a participating municipality (1) has baseline data on SWM in urban areas; (2) updates the solid waste monitoring system annually; and (3) issues an annual report on SWM.

systems. The results are not yet available for the PBG programs in India and Indonesia (see Section 3.1) targeting large-scale reforms. Another PBG program in Ghana, evaluates the presence of municipal SWM monitoring systems. Throughout the implementation period, the program saw a significant increase in the percentage of municipalities scoring the maximum number of points for monitoring their SWM activities in urban areas (Figure 3.6). Some municipalities that joined the program late were also able to catch up quickly and reach the maximum mark within a year.

Beyond the reviewed projects in this report, Morocco's development policy loan (DPL) program exemplifies how financing incentives can foster SWM institutional reforms at different government levels. The DPL is a World Bank financing instrument that provides budgetary support to

governments upon achievement of an agreed-on set of prior actions<sup>13</sup> required for policy reform. While it does not fall precisely under the realm of RBF approaches, the DPL does provide incentive for governments to meet critical institutional conditions for sector enhancement, which can serve as a foundation for more advanced RBF approaches. In Morocco, two DPL series in the SWM sector successfully supported the country's fifteen-year-long National Municipal Solid Waste Management Program (Box 3.5).

Some other examples of the effectiveness of institutional strengthening include results from small-scale capacity-building activities. In the West Bank project, for example, training and

<sup>13</sup> Prior Actions are policy and institutional actions deemed critical to achieving the objectives of a program supported by the development policy operation.

### Box 3.5

#### The DPL Program on SWM in Morocco

The National Municipal Solid Waste Management Program (PNDM) was launched in Morocco in 2007 as one of the core elements of the government's overall reform program for municipal SWM. The program targeted three areas of reform: governance, financial sustainability, and social and environmental considerations. It comprised three phases spanning fifteen years:

- 2008–12: Initialization phase, which allowed for the integration of ongoing projects into the priority projects and kicked off the three reform areas
- 2012–17: Scale-up phase, which focused on further improvements in the sector governance; sustainability of institutional and financial management of household waste services; sectoral environmental and social performance; and development of recovery systems
- 2017–22: Generalization phase

The two DPL series financed by the World Bank covered approximately 13.4 percent (around US\$530 million) of the total cost for PNDM. The first DPL series program (DPLs 1 and 2, 2009–11) supported the key foundations of the government's reform to establish an enabling environment for an integrated and affordable municipal solid waste system. The second series (DPLs 3 and 4, 2013–15) built on the momentum gained during the first series while deepening the reforms at the regional and municipal levels. Aligned with the PNDM reform areas, the DPL series introduced prior actions, including the following:

- **Governance of the SWM Sector:** (1) Establish a National Commission for the National Municipal Solid Waste Management Program; (2) adopt eligibility criteria for the allocation of financial support to municipalities; and (3) update legal arrangements related to the classification of waste and delineate the provincial or prefectural primary plan and administrative procedures and technical standards for MSW landfilling.
- **Sustainability of SWM Services:** (1) Adopt a government budget law for 2009 that included appropriate allocation for the PNDM; (2) appoint a coordinating entity in charge of developing a national Clean Development Mechanism program to facilitate municipalities' access to the carbon market; and (3) launch a funded capacity development program in the SWM sector targeting municipalities.
- **Environmental and Social Considerations:** (1) Disseminate legislation related to the responsibilities and operations of the national and regional environmental impact assessment committees and the procedures for environmental impact assessment public consultation processes; and (2) adopt principles for the inclusion of social considerations in the PNDM framework.

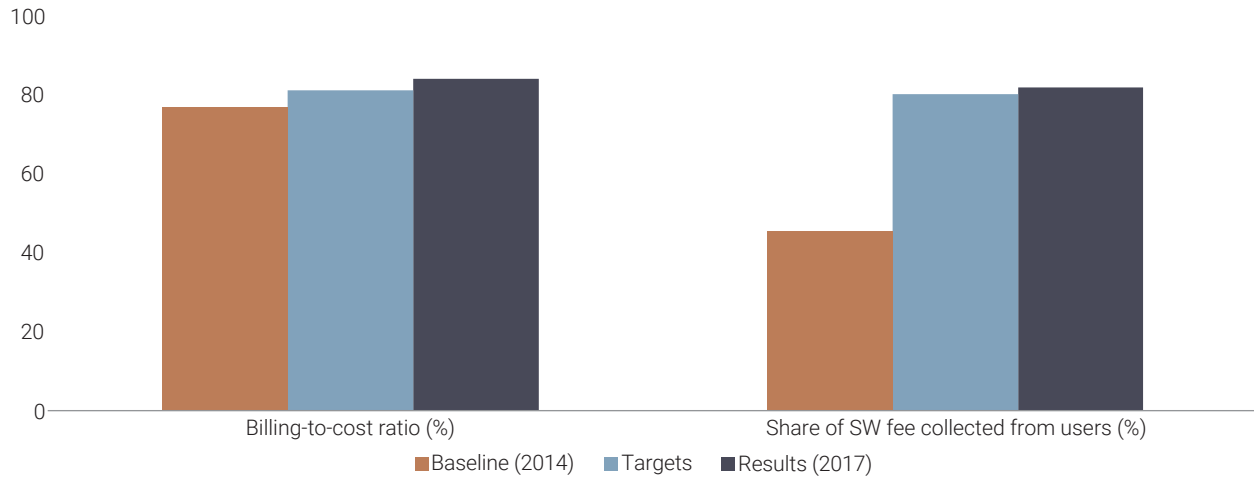
A full list of prior actions for policy reforms under the DPL series is provided in Annex B.

The two DPL series were successful in achieving most of their targets, although some challenges remained. The budget support helped the central government transfer funds to municipalities for SWM services and activities, which was instrumental in enhancing the sector's performance in the country, as evidenced by the increased SWM collection and disposal rates. At the closure of the DPL series, however, a few challenges were identified in sustaining the impacts and completing the goals of the PNDMs, such as completing the remaining sanitary landfills, closing informal dumpsites, improving recycling rates, and addressing difficult social issues related to informal waste pickers.

Source: IEG 2021.



**Figure 3.7**  
**Enhanced Financial Sustainability in West Bank**



Source: World Bank 2018c.

consultations were provided throughout project implementation to improve the institutional capacity of the JSC and local governments. The JSC conducted project-specific training for local governments on fee collection, public awareness campaigns, and enhancements to primary waste collection services. Similarly, the Gaza project worked to build the capacity of local partners for effective project implementation, landfill operations, and infrastructure maintenance, along with related services. Additionally, support was provided for fiduciary activities, compliance, and the engagement of external consultants, all vital to the project's successful execution (World Bank 2023c).

### **Financial Sustainability**

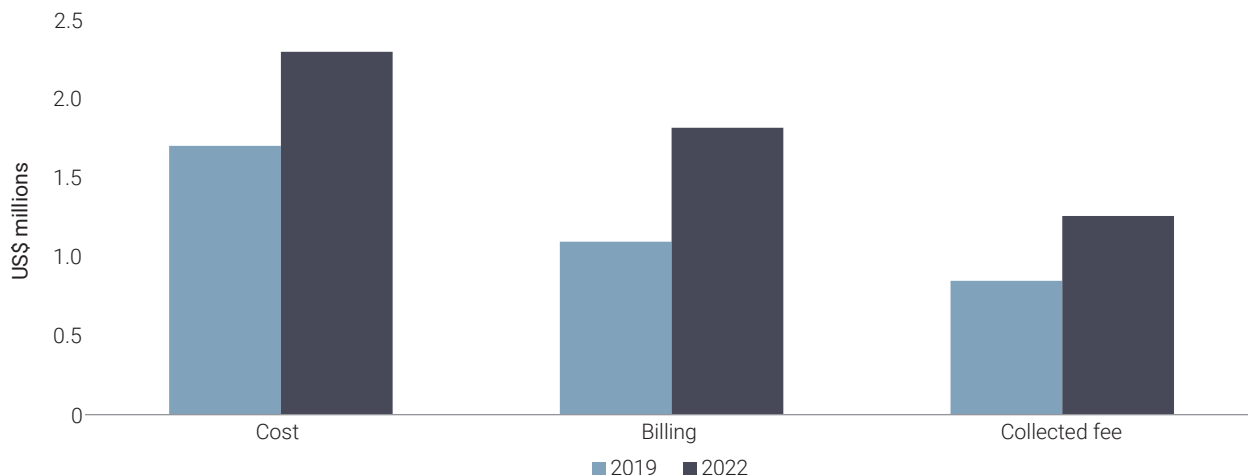
Results-based SWM projects are often designed to improve the financial health of SWM systems.

The assumption underlying such an approach is that improved services will lead to greater willingness among users to pay for them and motivate municipal councils to enforce fee collection for continuous operations and prioritize SWM for future investment.

Some projects seek to increase fee collection, in terms of both coverage and amount. The West Bank SWM project, for example, provided service providers, the JSCs, with PBGs, contingent upon the achievement of targets linked to enhanced cost recovery for the SWM system. As a result, the project saw a significant increase in solid waste fee collection and the billing-to-cost ratio, surpassing all the targets (Figure 3.7). This improvement was largely attributed to changes in the fee collection strategy developed through the project's technical assistance component. The strategy included integrating the SWM fees into electricity bills and establishing tariffs and an accounting



**Figure 3.8**  
**Improved Financial Performance in Gaza**



Source: Pillars & Enfra Consulting 2022.

framework for the fees in the JSC between two governorates, as well as conducting workshops to develop billing approaches tailored to the local context of each municipality (World Bank 2018c).

The ICR states that a key success factor was the customized rewarding system that provided strong incentives for both high- and low-performing municipalities throughout the duration of the project. Low performers that were unable to meet the targets had the opportunity to improve their performances in the subsequent year and earn payments they missed in the previous one. At the same time, payments for high performers were not affected by the low performers (World Bank 2018c).

In Gaza, the project saw a 90 percent reduction in the cost of medical waste treatment, from US\$2.87 to US\$0.29 per kilogram, with a daily treatment capacity of 800 kilograms of infectious medical waste safely disposed. Consequently, the

collection rate in participating municipalities rose annually, ultimately reaching 71.2 percent, and exceeding the initial target of 65 percent (World Bank 2023b).

The improved service quality brought by the project's interventions led to increased willingness among citizens to pay. Figure 3.8 shows the trends in the cost-billing gap and actual fee collection over the years. The total billings surged by nearly 50 percent in less than four years, a remarkable accomplishment in a challenging environment. Moreover, the gaps between billing and cost and between fee collection and cost shrank by 14 percent and 5 percent, respectively. This improvement was achieved despite the higher costs incurred from expanding operations and enhancing service quality. These improvements have been maintained since 2018, except for notable drops that occurred in association with COVID-19 in 2020 and with major conflict



### Box 3.6

#### Morocco Municipal Solid Waste Management Support Program (P178768)

Solid waste management (SWM) is among the key government priorities in Morocco with marked SWM coverage and quality improvements recorded in the past decade across the waste value chain. However, with SWM currently accounting for approximately 28 percent of urban municipalities' overall budget, service affordability remains a key challenge in a fiscally constrained context.

This six-year, US\$250M program in preparation has an overarching objective to enhance the financial and environmental sustainability of the SWM value chain in Morocco. The program adopts a two-pronged approach: focusing on effective resource mobilization, on one hand, and improved cost effectiveness in service delivery on the other hand. The program will finance activities across eight result areas, each associated with DLIs.

Pillar 1: Strengthening Sector Policy and Institutional Capacity

- Results Area 1: Modernization of the SWM institutional framework
- Results Area 2: Enhancing Municipal SWM performance and service quality

Pillar 2: Improving Financial Sustainability

- Results Area 3: Introducing a cost recovery mechanism
- Results Area 4: Promoting the circular economy with enhanced waste recycling and recovery
- Results Area 5: Leveraging private sector finance for SWM

Pillar 3: Enhancing Environmental Sustainability

- Results Area 6: Upgrading of Selected Controlled Landfills within the Program Area.
- Results Area 7: Addressing Groundwater, Soil and Air Pollution at Priority Controlled Landfill Sites in the country.
- Results Area 8: Rehabilitation and Closure of Priority Abandoned Dumpsites.

*Sources:* World Bank Program Concept Note (P178768); World Bank calculations based on data covering a sample of 100 municipalities, MoI (2023)

escalation in the country since October 2023.

A program in preparation in Morocco, the Municipal Solid Waste Management Support Program (P178768), similarly builds off improvements made in SWM coverage and quality and seeks to enhance the financial sustainability of SWM services across the waste value chain.

To achieve financial sustainability, the program prioritizes effective resource mobilization such as by leveraging private sector finance and improved cost effectiveness of service delivery through introducing a cost recovery mechanism (Box 3.6).



4

**Key Takeaways**



Building upon the review of the World Bank's growing results-based SWM portfolio, this report provides food for thought to sector experts, practitioners, and policymakers for enhanced design and implementation of RBF approaches in the SWM sector in the areas outlined below.

### **Targeting Feasible and Sustainable Results**

By design, the common objective of results-based SWM projects, both large-scale PBG programs and small-scale pilots, is to sustain the enhanced SWM services beyond project completion, mainly by strengthening the capacities of stakeholders and reforming institutional and financial sys-

tems. With the short timeframe in which the portfolio has evolved, however, it is still premature to determine the long-term impacts and effectiveness of the RBF approach in maintaining the desired level of service quality. Doing so requires further research in the coming years as more projects, including the recent, large-scale, SWM-focused PBGs, are fully implemented and ready for evaluation. Meanwhile, limited, yet interesting, results from completed projects indicate a promising pathway toward sustaining impact in the long term (Box 4.1). Such sustained impact is possible when RBF triggers incremental changes to existing systems that can be maintained without additional financial resources—for example, increasing revenue by expanding the registered user base in the existing billing system.

#### **Box 4.1**

#### **Sustained Impacts of a Results-Based SWM Project in the West Bank**

The West Bank solid waste management (SWM) project has contributed to a significant increase in revenue collection for SWM services. In Hebron, the fee collection ratio rose from 20 percent at baseline in 2014 to 73 percent at project end in 2017, while Al Dahriyya witnessed an increase from 20 percent to 99 percent over the same period. The aggregate billing-to-cost ratio, or cost recovery ratio, also improved, climbing from 76.7 percent to over 84 percent, surpassing the project's target.

Notwithstanding these achievements, questions persist regarding the long-term sustainability of the impacts of results-based SWM projects, particularly whether municipalities can maintain service quality and cost recovery after the project ends. To gauge the sustained impact of the project model, data provided by four participating municipalities were analyzed to ascertain whether they had sustained, improved, or regressed in terms of the fee collection ratio and billing-to-cost ratio. The findings indicate the municipalities had generally succeeded in upholding financial performance post-project completion. As Figures B4.1.1 show, the significant increases in the billing-to-cost ratio and fee collection ratio during the project implementation period have been stably maintained since 2018, except for the notable drops that occurred in association with COVID-19 in 2020 and with major conflict escalation in the country since October 2023.

These outcomes can be attributed to several measures, including integrating SWM fees with prepaid electricity metering; making a transition from annual to monthly billing; and offering discounts for upfront annual fee payments. The customer base has been expanded to encompass all waste generators, including commercial and industrial customers, and fees have been adjusted in response to the ongoing increase in fuel costs. While these achievements are significant, especially in the context of regional challenges, it is pertinent to mention that the reported results are based on self-assessments by the municipalities and have not undergone independent verification.

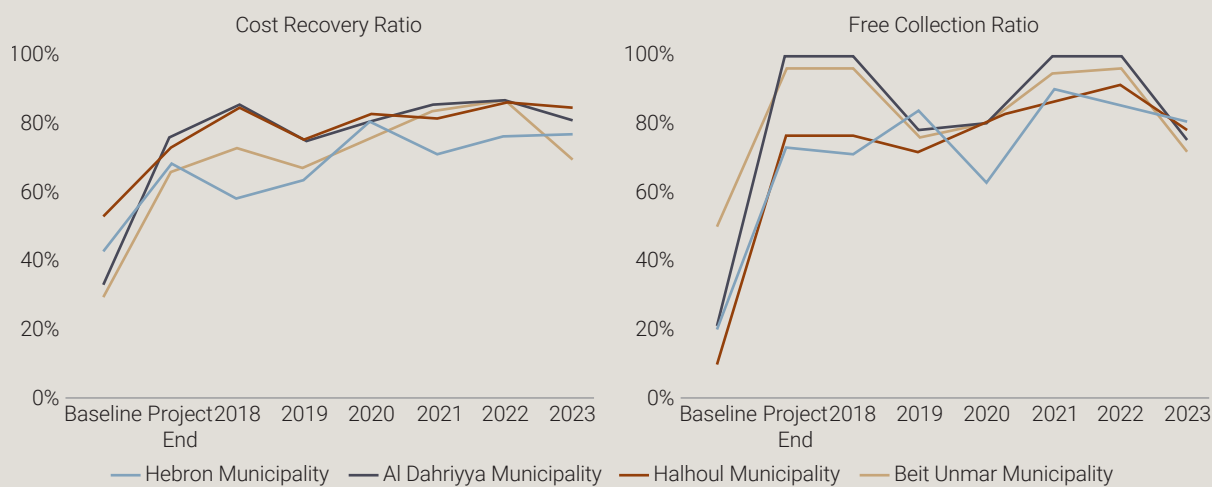
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## Box 4.1

### Sustained Impacts of a Results-Based SWM Project in the West Bank *(continued)*

**Figure B4.1.1.**

#### Increase in Cost Recovery and Fee Collection Ratios in the West Bank



Note: OBA: Output Based Aid; TDF: Town Development Fund.

### Solid Evidence-Based Project Design

The collection of credible baseline information is particularly important for effective implementation of an RBF approach, which is designed to tie funding to quantifiable achievements compared to baseline. In many cases, however, especially in LMICs, such baseline data are unavailable or unreliable. The GPRBA offers technical assistance to fill the information gap and support baseline studies that can lay the foundation for well-designed incentives and implementation of a results-based SWM project. The recent GPRBA-funded study in Yemen described in Box 4.2, for example, helped with data collection and feasibility assessment to design an RBF component that provides incentive to service providers

to expand primary waste collection services to underserved areas and improve service delivery levels in selected cities.

### Financing Arrangement for Upfront Costs

A key design feature for results-based SWM projects is establishing a financing arrangement for upfront costs (that is, pre-financing), before achieving agreement on a set of results and receiving associated funding. Designing a pre-financing arrangement requires a careful, balanced approach; a sufficient share of performance risk must be transferred to the service provider, and provision of some upfront capital for necessary milestones is important, especially in



## Box 4.2

### Baseline Surveys for the Results-Based SWM Project in Yemen

A GPRBA-funded study conducted baseline surveys, including 475 key informant interviews and 35 focus group discussions in three cities, Aden, Sana'a, and Mukalla. The discussions comprised both formal and informal groups, such as government agencies, associations, universities, private businesses, marginalized groups, internally displaced people, and the public. The study consisted of the following elements:

- *Documentation of processes and practices:* The study documented the collection, disposal, and recycling processes, identifying the locations of trash collection points, transfer stations, informal dumping areas, recycling markets, and landfills, and created a consolidated map of the facilities. It also documented the separation, handling, and disposal practices for different types of waste, such as domestic, industrial, medical, and hazardous waste.
- *Key informant interviews:* The various stakeholders interviewed included local NGOs, UNOPS, local government officials, Cleaning Fund supervisors, landfill operators, informal trash pickers, city cleaners, primary and secondary collection point operators, transfer collection workers, and recycling collection workers, among others.
- *Identification of the informal sector's role, beyond complying with do-no-harm safeguard provisions:* The study surveyed 67 informal waste workers (thirteen female and fifty-four male) and conducted six focus group discussions (involving sixty informal waste workers).
- *Financial and institutional assessment of the Cleaning Fund (public SWM service provider):* This assessment identified deficiencies in the existing framework and informed the development of a measurable, verifiable, achievable, and sustainable RBF model for enhanced SWM services.

Source: Development Monitors 2022.

countries with weak capacities. The absence of an agreed-on pre-financing arrangement can result in critical implementation delays and challenges. Municipalities in the West Bank, for example, faced difficulties in implementing planned activities because they were unable to find funding sources to finance upfront costs. Mitigation strategies for upfront cost risks can vary, depending on the local context and needs. They include the following:

- *A phased funding arrangement with minimum conditions:* Some projects, including large-scale PBG programs, introduce eligibility criteria (that is, minimum conditions) for municipalities or service providers—
- *Advancement arrangement by central government:* Central governments can set up a

mostly to safeguard their capacities to execute the investments—as well as more advanced indicators, which reflect main goals of a program. These minimum conditions are linked to milestones that do not require significant investments, such as the development of plans for user charge levies, budgeting for O&M, and the establishment of performance management systems. This approach allows municipalities or service providers to receive funding faster once they meet the minimum conditions to execute the investments in needed infrastructure and services.



mechanism to enable advanced payment to municipalities. In Nepal, the Ministry of Finance provided conditional grant advances to municipalities from the TDF, allocating the funds they needed to cover expenditures before triggering results-based disbursements.

- *Upfront capital from the private sector:* In cases in which a system to recover advances is unavailable, the advance payment model used in Nepal may not be appropriate. Under these circumstances, an alternative RBF mechanism, the impact bond, can be explored. This model relies on private investors to provide the necessary upfront capital for a service provider to initiate and deliver needed services. The investors are compensated only if the service meets specific, measurable targets.<sup>14</sup> In exchange for assuming this risk, investors receive a return on their initial investment. Untested in the SWM sector, the impact bond is an alternative open to further discussion and consideration.

### **Public Awareness**

The key to sustaining improved SWM systems beyond a project’s closure lies in raising awareness, engaging in outreach, and fostering local ownership. In some notable instances, various projects have successfully used participatory methods to influence behavior and strengthen local ownership. Projects in Nepal and the West Bank, for example, enabled municipalities to customize their service delivery models to meet their unique needs. Initial focus group discussions also play a crucial role in addressing

stakeholder concerns and facilitating their early participation. Further dialogue with local and regional administrators sheds light on the main issues and obstacles encountered in project implementation. These collaborative and consultative efforts are instrumental in gaining the commitment of both municipalities and citizens, thereby extending project ownership to include not only the implementing bodies and service providers but relevant nongovernmental actors. This inclusive approach cultivates trust and sets the project on a path to successful outcomes. Overall, the strategies and incentives to alter behaviors across different target groups must vary, yet they share the commonality of requiring both grassroots and top-down approaches (World Bank 2023a).

### **Support in a Fragility, Conflict, and Violence (FCV) Context**

Large-scale, multisector PBG programs that include investments in the SWM sector are deemed less suitable for FCV situations because of the significant institutional capacity required for their implementation. Smaller-scale pilot RBF approaches, on the other hand, are feasible for these challenging environments. RBF’s flexible and adaptable design has proved effective in contexts emerging from or amid fragility and conflict, as demonstrated by the experiences in

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<sup>14</sup> For readers seeking further details on the subject, additional information regarding the scope and specific cases of impact bonds can be found at the GO Lab’s website. For an in-depth analysis of investment returns and the pricing of outcomes related to impact bonds, please refer to the GPRBA resource.



Nepal, West Bank and Gaza, and Yemen. In the West Bank, for example, the project introduced a catch-up mechanism: allowing poorly performing municipalities additional opportunities to “catch up” in achieving the needed performances and receive the associated funding. This allowed for service delivery disruptions resulting from fluctuating tensions and movement restrictions and to avoid unfair penalization of municipalities for any arising political or other implementation challenges. Chapter 3 provided more details about the West Bank project.

Yet, effective implementation of RBF approaches still requires a certain level of preparedness in terms of institutional and financial arrangements, even in FCV situations. The RBF approaches may be less effective in environments where conflicts are active and/or institutions have yet to be developed (including an implementing institution). This is because establishment of new institutions is extremely challenging and takes longer than the average implementation period of a results-based SWM project. In Yemen, for instance, the project was able to introduce RBF approaches because service providers, the CCIFs, were functional and ready to implement SWM activities despite challenges on the ground. The discussion of institutional arrangements in Chapter 3 emphasized this prerequisite.

### ***Enabling Environments for Private Sector Engagement***

The involvement of private actors in SWM offers numerous benefits. The public sector can tap into the operational know-how and proprietary

expertise of specialized private sector partners, mitigating large upfront capital expenditure, optimizing operating budgets, and reducing the overall cost of service. Collaboration with private sector partners may also facilitate knowledge transfer and enhance the operational and technical capacity of public service providers. Furthermore, the inclusion of independent evaluation and quantifiable measurement of results can enhance the transparency, credibility, and viability of institutional and financial systems for the SWM sector, thereby creating more favorable conditions for private sector participation across the SWM chain. In practice, however, various contributing factors make engaging private partners in the SWM sector extremely challenging.<sup>15</sup> The feasibility of private sector engagement is contingent upon certain institutional and financial conditions. Challenges often arise when attempting to identify private sector solutions for small to medium-sized municipalities without considering private sector’s need for a clear revenue model often requiring economies of scale. In Nepal, for instance, the small scale of the secondary cities made it financially unviable for the formal private sector to engage in a full spectrum of activities. Also, the success of private sector participation is often tied to political stability and the resolution of political conflicts. The private consortium operating the Al-Minya landfill in West Bank for example, was recruited for their successful implementation

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<sup>15</sup> Key factors include, but are not limited to, deficiencies in terms of a well-designed and transparent private partner solicitation process, a clearly determined revenue model, transparency regarding the ultimate government counterpart and its capacity to coordinate procured services, a clear service zone and service performance controls, and a well-designed contract base embedded within local procurement laws.



of a results-based SWM project, but political instability caused delays and service disruptions. In such environments where certain institutional and financial conditions are unmet, privatization efforts need to be approached with caution.

### ***Future Outlook***

This report serves as an important resource in understanding the impact of the Bank's RBF portfolio to improve SWM systems and infrastructure. While some favorable results from completed projects indicate a promising pathway, the short timeframe in which the portfolio has evolved makes it still premature to determine

the long-term effectiveness of RBF in maintaining the desired impacts. Doing so requires further research in the coming years as more projects, including the recent, large-scale, SWM-focused PBGs, are fully implemented and ready for evaluation. Additional future research areas may include: (i) assessing cost and benefit of RBF in comparison to conventional input-based approaches to SWM; (ii) demystifying pricing mechanisms for RBF approaches (e.g., pricing indicators and waste tariffs) whose complexity and context-dependent nature can pose challenges to effective planning and implementation; and (iii) continuing to take stock of new techniques and tools deployed through RBF and their value in addressing emerging challenges in the sector.



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# Annex A. List of the Performance Indicators Used in the Reviewed Results-Based SWM Projects

## WASTE COLLECTION AND TRANSPORTATION

Project Name	Indicator
Clean and Resilient Environment for Blue Sea Project	Increase in the quantity of waste collected and disposed of at municipal SWM facilities (tonnes/capita)
	Increase in household coverage (%)
Jamaica Integrated Community Development Project	People in urban areas provided with access to regular SWM under the project (number)
	Solid waste skips installed in communities (number)
Metro Manila Flood Management Project	Progress made by barangays with improving solid waste collection and selection of up to 40 best-performing barangays during the life of the project
Msimbazi Basin Development Project	Waste collected at increased frequency and coverage (US\$/collection)
Greater Accra Resilient and Integrated Development Project	Community committees organized and given solid waste collection equipment (number)
	Dumpsites capped (number)
	Transfer stations constructed and maintained (number)
Nepal Solid Waste Management Output-Based Aid Study	Technical scorecard (number)
Solid Waste Management OBA Pilot in West Bank	Improvement in cleanliness of areas (number, based on scorecard)
Improving Access to Solid Waste Management Services in Greater Monrovia through Results-Based Financing	Quantity of waste collected by Community Based Enterprises from the targeted communities and disposed of at formal waste collection locations or waste transfer stations (tonnes)
	Application of a community cleanliness index (number)
	Proportion of collection locations cleared completely each week (%)
Additional Finance: Gaza Solid Waste Management Project	Improved transfer station service: This target gauges the proper upkeep and management of the newly constructed transfer station at Rafah. Targets considered include (1) maximum time that collected waste is stored at the transfer station before landfill disposal; and (2) organization of and improvement in cleanliness of transfer station facilities.

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## WASTE COLLECTION AND TRANSPORTATION *(continued)*

Project Name	Indicator
	Improved container upkeep and truck maintenance service (secondary collection services): These improvements will be measured through daily observations by the JSC—in Khan Yunis, Rafah and Central Governorates, and regular reports will be prepared. This will be a dual responsibility between the JSC-KRM and participating municipalities. Target indicators to be monitored include (1) overfilled containers in urban/populated areas; (2) broken/unrepaired containers; (3) regular status reports generated by the JSC-KRM related to the overall conditions of containers (fill level, container cleanliness, and cleanliness of surrounding area) and shared with participating municipalities; and (4) cleanliness and operational/functional conditions of fleets/trucks used by the JSC-KRM for secondary collection.
Yemen Integrated Urban Services Emergency Project II	Increase in quantity of waste collected (%)

## COST RECOVERY

Project Name	Indicator
Clean and Resilient Environment for Blue Sea Project	Cost recovery rate of municipal SWM services (%)
Maputo Urban Transformation Project	Improvement in cost recovery ratio (%)
Nepal Solid Waste Management Output Based Aid Study	Financial assessment
Solid Waste Management OBA Pilot in West Bank	Increase in Solid Waste fee collected from users by municipalities/village councils in Hebron governorate (%)
	Increase in Solid Waste fee collected from users by Municipalities/Village Councils in Bethlehem governorate (%)
	Increase in billing-to-cost ratio (%)
Improving Access to Solid Waste Management Services in Greater Monrovia through Results-Based Financing	Revenue collected from householders for primary collection. (fees divided by billing) (%). Note that this would only apply where fees are collected by Monrovia City Corporation and/or Paynesville City Corporation.
	Increase in tipping charges collected from private sector operators disposing of waste at the waste transfer stations (fees divided by billings) (%)
Additional Finance: Gaza Solid Waste Management Project	Reducing costs and increased fee collection to support cost recovery: targets considered include (1) increase in timely payments collected from municipalities by the JSC-KRM for transfer station and waste disposal services and (2) cost reduction per kilogram of medical waste treated. The latter is expected to be achieved by switching from the current autoclave treatment system to a microwave medical waste treatment system and the installation of a solar panel for powering the treatment facility, which will cost less than using electricity and fuel for the generator.
Yemen Integrated Urban Services Emergency Project II	Increase in fees collected compared to accrued operating revenues (%)
	Increase in CCIF's accrued operating revenues (%)



## WASTE PROCESSING AND DISPOSAL

Project Name	Indicator
Greater Accra Resilient and Integrated Development Project	New engineered landfill constructed (yes/no)
Solid Waste Management OBA Pilot in West Bank	Increase of in ratio of sanitarly managed waste to total generated waste (%)
Improving Access to Solid Waste Management Services in Greater Monrovia through Results-Based Financing	Waste cleared from transfer station each week (%)
	Proportion of waste received at waste transfer station transferred to landfill (%)
	Proper compaction and covering of incoming waste (%)
	Management of litter around the landfill (cleanliness index score)
Additional Finance: Gaza Solid Waste Management Project	Implementation of environmental health and safety measures for landfill management (no burning of waste, no workers at the landfill without proper personal protective equipment, etc.) (yes/no)
	Improved landfill services: The JSC-KRM's performance at the landfill will be measured by (1) leachate flow generated at the landfill treated at the Waste Water Treatment Plant (WWTP) in compliance with agreed-on requirements (compliance with prespecified leachate quantity/diluting level accepted by WWTP); (2) proper daily soil coverage (quantity, depth, and frequency of soil cover); (3) environmental monitoring and reporting (regular publishing of reports); and (4) regular cleaning of areas surrounding the landfill, access roads, and adjacent communities.
	Improvement in medical waste services: Proper medical waste collection and treatment constitutes an integral service to be provided by the JSC-KRM under the upgraded system. Service improvements in medical waste management will be measured by (1) level of source separation for infectious waste and (2) compliance with established medical waste handling procedure as defined by SOP. Medical waste producers (MWP), such as hospitals, clinics, and NGOs, will be responsible for the proper separation of medical waste, to be measured by a "quality of separation index." Hospitals and clinics receiving service from the JSC-KRM will be given discounts and/or credits on the fees they pay to the JSC-KRM based on the quality of separation of infectious and noninfectious medical waste and compliance with procedures for packaging and containment for JSC-KRM collection.

## WASTE SEGREGATION AND RECYCLING

Project Name	Indicator
Ningbo Municipal Solid Waste Minimization and Recycling Project	Community solid waste separation scorecard (number)
Maputo Urban Transformation Project	Improvement in volume of waste reused or recycled (tonnes)
Chennai City Partnership: Sustainable Urban Services Program	10% amount (tonnes per day) of resources recovered/recycled from dry waste (in zones 4, 5, 6, and 8) over baseline
	15% amount (tonnes per day) resources recovered /recycled from dry waste (in zones 4, 5, 6, and 8) over baseline

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## WASTE SEGREGATION AND RECYCLING *(continued)*

Project Name	Indicator
China Plastic Waste Reduction Project	Verified utilization of standard/thicker ground plastic film by farmers and cooperatives in compliance with GB13735-2017 (yes/no)
	Verified collection of used plastic from farmland and placement at designated collection points (from which it is to be transported for safe handling and treatment as part of the SWM system).
Jamaica Integrated Community Development Project	Based on how well recyclables and organics are being separated as well as the cleanliness of the community and dumpster surroundings (qualitative cleanliness targets)
Msimbazi Basin Development Project	Waste diverted from landfill through recycling and composting in informal settlements (US\$/tonne)
	Waste diverted from landfill through recycling and composting in other areas (US\$/tonne)
China Plastic Waste Reduction Project	Achievement of high rate and better quality of household waste separation at source (quantified by AI and scored in real time by pre-defined methodology embedded in smart cabins)

## INSTITUTIONAL REFORMS AND CAPACITY BUILDING

Project Name	Indicator
Kerala Solid Waste Management Project	Preparation of a 5-year citywide plan for climate-smart and disaster-resilient SWM (Yes/No)
	Issuance of SWM bylaws that incorporate the principles of the Kerala government's new SWM strategy (Yes/No)
	Confirmed access to/use of facility for safe disposal of waste (Yes/No)
	Hiring of two top-level staff as per SWM organizational structure approved by Kerala government (Yes/No)
	Signed performance-based contracts for waste collection and transportation (C&T) services (Yes/No)
	Plan developed for levying user charges and O&M budgeting (Yes/No)
	M&E implemented, including grievance redressal mechanism (Yes/No)
Chennai City Partnership: Sustainable Urban Services Program	SWM service performance management system integrated and operationalized in Greater Chennai Cooperation for monitoring SWM service indicators. (Yes/No)
Greater Secondary Cities Support Program	Solid waste management scorecard (Number)
Solid Waste and Plastic Management Improvement Project	Improved waste collection and landfill management contracts, including performance indicators, among participating municipalities (Yes/No)
Yemen Integrated Urban Services Emergency Project II	Development of SWM strategy and action plan (Yes/No)
	Design and implementation of the Monitoring Information System (Yes/No)
	Development and implementation of landfill SOPs (Yes/No)
	Awareness campaigns conducted (number)



## SOCIAL INCLUSION

Project Name	Indicator
Maputo Urban Transformation Project	Informal waste pickers with livelihoods restored (number)
Yemen Integrated Urban Services Emergency Project II	Increased female participation in technical/leadership roles (%)



# **Annex B. Design of Prior Actions for DPL Programs on SWM in Morocco**

The following list of prior actions for the development policy loan (DPL) programs on SWM in Morocco shows the phased building blocks to enhance the institutional, economic, environmental, and social performance of the SWM system in the country.



Objective	Subcategory	DPL 1 (P104937)	DPL 2	DPL 3	DPL 4
Governance	Institutional arrangements	<p>Issuance of a circular by the Secretary of State in charge of Water and Environment establishing the National Commission of the National Municipal Solid Waste Management Program (PNDM)</p>	<p>The National Commission of the PNDM met at least twice a year in calendar years 2009 and 2010 to coordinate, review, and evaluate the implementation of the PNDM.</p> <p>Three partnership agreements (<i>conventions de partenariat</i>) were signed between the central and local governments to improve solid waste practices.</p>		
	Planning system	<p>Publication in the official bulletin of the decree related to classification of waste; submission to and approval by the Ministry of Interior and the Secretariat of State in charge of Water and Environment of the two draft decrees related to procedures for the elaboration of a provincial or prefectural primary plan for municipal solid waste (MSW) and administrative procedures and technical standards for MSW landfilling</p>	<p>Two regional commissions for the review and validation of provincial and prefectural MSW primary plans were established and are operational.</p>		
Financial sustainability	Budget allocation for participating municipalities	<p>Adoption by the commission of eligibility criteria for the allocation of financial support to municipalities under the PNDM</p> <p>Appropriate funding was made available to the PNDM for 2008, and the 2009 budget law includes appropriate budget allocations in support of the PNDM.</p>		<p>Appropriate funding was made available to the National Solid Waste Management Program for 2012, and the borrower's draft budget law for 2013 included appropriate budget allocation in support to the PNDM.</p> <p>The Minister of Interior issued Circular No. 5533 regarding local governments' budget preparation.</p>	<p>The Ministry of Interior adopted a multiyear assistance program to support local governments and create intermunicipal and regional institutions for local public services, including MSW services, and secured the financing for the implementation of such a program on December 2, 2013.</p>

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Objective	Subcategory	DPL 1 (P104937)	DPL 2	DPL 3	DPL 4
Financial sustainability (continued)	Contract management		The National Commission of the PNDM reviewed and approved the three sets of model bidding and contracting documents, and the Minister of Interior issued a circular to dispatch them and require their use.	The Minister of Interior issued Circular No. 8029 (dated May 23, 2012) requiring municipalities to disclose extracts of MSW service contracts in the Official Gazette for Local Governments.	
				The Minister of Energy, Mines, Water, and Environment signed three contracts with engineering firms on December 10, 2012, to assist local governments in better preparing and managing MSW projects and contracts throughout the borrower's territory	
				The Minister of Interior issued Circular No. 17887 (dated December 11, 2012) addressing the issue of arrears due by local governments under MSW service contracts, including specific instructions and guidance to ensure fair estimate of service costs, on price revision, and on budget arrangements regarding arrears rescheduling agreements.	

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Objective	Subcategory	DPL 1 (P104937)	DPL 2	DPL 3	DPL 4
Financial sustainability (continued)	Revenue collection		The signature of a circular by the Minister of Interior on the application of Article 23 of Law 28-00 on user fees for municipal waste	The Minister of Interior issued Circular No. D13015 (dated December 17, 2012) establishing an MSW fee that municipalities could charge large waste producers, in compliance with the provisions of Article 23 of Law No. 28-00 on solid waste management (dated November 22, 2006).	The Chief Treasurer issued Decision No. 0188 (dated July 16, 2014) regarding the General Treasury's advisory services to local governments to improve the management of their revenues.
	Enhanced transparency through citizen feedback for financial programs		The 2010 action plan for the PNDM provided adequate funding for the execution and mainstreaming of a communication and public awareness program.	The National Commission for the PNDM, on October 23, 2012, approved the introduction of a citizen feedback tool (citizen report cards) on the quality and adequacy of municipal solid waste services as a key component of the PNDM to support local governments in building demand-side governance in municipal solid waste service delivery.	The Minister of Interior issued Circular No. 17495 (dated October 28, 2014), which defines the modalities for a third-party conciliation mechanism for disputes and requires the inclusion of such a mechanism in all delegated management contracts between municipalities and private operators for MSW services.  The National Commission for the PNDM, on October 29, 2014, adopted the use of the citizen report card as an eligibility criterion for program financial support.
Social and environmental	Systems for environmental assessments and indicators	Publication in the official bulletin of the decrees related to the responsibilities and operations of the national EIA committee and regional EIA committees and the procedures for EIA-related public consultations	Three regional EIA committees were established and are operational.	The Cabinet Council, on December 14, 2012, approved the draft of a law on environment and sustainable development, introducing the right of any person to get access to environmental information, the institutional arrangements for environmental control, and the principle of extended producer responsibility.	Fourteen Regional Observatories for Environment and Sustainable Development were established in 2011–14 to monitor environmental indicators, including those related to solid waste management.

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# Annex C. Brief Summary of the Reviewed Projects

## 1. Urban Local Government Strengthening Program (P118152)

- **Country:** Tanzania
- **Financing amount:** US\$255M
- **Financing instrument:** PforR
- **Preparation and implementation duration:** October 2012–December 2020
- **PDO:** To improve institutional performance for urban service delivery in Program urban local government authorities.
- **Overall activities and RBF component description:** The program activities fell under three areas: (i) improve institutional performance for urban service delivery in Program urban local government authorities; (ii) strengthened urban local government public sector management capacity; (iii) overall strengthening of the local government development grant mechanism. Eligible infrastructure investments included roads, markets, abattoirs, SWM, and public spaces which were all associated with DLLs.

## 2. Ningbo Municipal Solid Waste Minimization and Recycling Project (P123323)

- **Country:** China
- **Financing amount:** US\$252.16M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** September 2013–March 2020

- **PDO:** To assist selected districts in Ningbo Municipality to increase the volume and proportion of municipal solid waste recycled with processes for waste separation at source and recycling.
- **Overall activities and RBF component description:** Four main project activities included: (i) municipal solid waste separation, collection, sorting and transportation; (ii) kitchen waste treatment; (iii) project implementation support; and (iv) capacity building and project management support.

The project included an output-based incentive program (OBIP) to award communities that participate in household waste separation. The objective was to incentivize residents and increase their participation in the program. The program comprised of a point system assigned by supervisors to generators and communities based on the extent to which they separated their wastes and the wastes' quality. Ningbo has reported that the process is vulnerable to human error and are therefore seeking ways to optimize the separation system (e.g., technologies that scan incoming waste and automatically assign level of purity). The OBIP will continue to operate after the project

with plans to improve the accuracy of the monitoring.

### 3. Output-Based Aid for Municipal SWM Project (P130461)

- **Country:** Nepal
- **Financing amount:** US\$4.28M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** June 2013–June 2017
- **PDO:** To improve access to high quality and financially sustainable SWM services in Participating Municipalities.
- **Overall activities and RBF component description:** The project had three components, including: (i) a service delivery subsidy to support gradual improvements in cost recovery in tandem with service quality improvements over a four-year period; (ii) technical assistance; and (iii) project management, monitoring, and verification activities. The project used an output-based service delivery subsidy to bridge the gap between the cost of delivering improved SWM services (capital costs, operations and maintenance costs, and other expenses) and the revenues that municipalities could collect for these services.

### 4. SWM OBA Pilot in West Bank (P132268)

- **Country:** West Bank and Gaza
- **Financing amount:** US\$8.26M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** October 2013–June 2018
- **PDO:** To improve access to quality and financially sustainable SWM services in Hebron and Bethlehem governorates.

- **Overall activities and RBF component description:** The project involved several key activities: (i) third party monitoring of improvements in waste management services and cost recovery and safeguards; (ii) building institutional structure; (iii) develop a management information system; (iv) develop plans for closing unsanitary dumpsites; (v) develop plans to manage slaughterhouse and medical waste; (vi) raise public awareness on the importance of improved SWM; and (vii) an OBA subsidy payment tied to improvements in waste management service and cost recovery.

The OBA, performance-based grants, were designed to support the first four years of landfill operation when revenues from user fees were not sufficient to cover the increased costs of adequate service delivery and provide an assurance of regular payments to the private company. The OBA fund was disbursed based on achievement of service improvements by the project participating local governments. Local governments were granted the OBA fund as a credit on their landfill disposal bill. The subsidy was phased out as services improved and local tariffs and fee collection rates increased.

### 5. Jamaica Integrated Community Development Project (P146460)

- **Country:** Jamaica
- **Financing amount:** US\$42M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** August 2014–May 2021



- **PDO:** To enhance access to basic urban infrastructure and services and contribute towards increased community safety in selected economically vulnerable and socially volatile inner-city communities of Jamaica.
- **Overall activities and RBF component description:** The project included four main components: (i) developing basic infrastructure and access to services; (ii) enhancing public safety and alternative livelihoods; (iii) supporting institutional strengthening for urban management and public safety; and (iv) supporting project administration.

The project's RBF component involved using results-based incentives to the National Solid Waste Management Authority for waste collection and recycling services and to CBOs and Environmental Wardens for carrying out litter management and collection.

## 6. Metro Manila Flood Management Project (P153814)

- **Country:** Philippines
- **Financing amount:** US\$207.6M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** September 2017–Expected November 2024
- **PDO:** To improve flood management in selected areas of Metro Manila.
- **Overall activities and RBF component description:** The project consists of four main components: (i) modernizing drainage areas (ii) minimizing solid waste in

waterways; (iii) supporting participatory housing and resettlement; and (iv) project management and coordination. The following activities fall under the second component minimizing solid waste in waterways: (a) strengthening solid waste collection systems, including necessary equipment; (b) conducting targeted IEC and awareness campaigns on solid waste management; (c) implementing an incentive-based approach for solid waste management results; (d) studies to improve solid waste management at metropolitan level; and (e) if found feasible, pilot innovative waste management opportunities.

The project incorporates an RBF approach that provides incentives to barangays (i.e., districts) upstream of pumping stations. Incentive payments will be based on independently verified results of improved waste collection in barangays. Up to 40 best-performing barangays will each receive small investments of around US\$10,000 to benefit the barangay's urban infrastructure (e.g., street lights, bicycle paths, or playgrounds). Additionally, the Project will provide technical assistance in establishing eco-patrols and appointing and training eco-aides. Barangays will designate respected leaders in the community to oversee proper individual/household-level waste disposal. The eco-patrols/eco-aides will be remunerated by the barangays, with some incentive payment, contingent upon the improvement of solid waste management within his/her community.



## 7. Greater Accra Resilient and Integrated Development Project (P164330)

- **Country:** Ghana
- **Financing amount:** US\$200M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** May 2019–Expected December 2025
- **PDO:** To improve flood risk management and solid waste management in the Odaw River Basin of the Greater Accra Region, improve access to basic infrastructure and services in the targeted communities within the Odaw River Basin, and to provide immediate and effective response to an eligible crisis or emergency.
- **Overall activities and RBF component description:** The project components include: (i) climate resilient drainage and flood mitigation measures; (ii) SWM capacity improvements; (iii) participatory upgrading of targeted flood prone low-income communities and local government support; (iv) project management; and (v) contingent emergency response. The activities under the SWM capacity improvements include community-based SWM interventions in targeted low-income communities including a major outreach program to sensitize and improve public behavior on SWM, improved litter management, construction of waste transfer stations, capping of old dumpsites, and final solid waste disposal capacity improvements. The RBF component consists of providing incentives to communities based on independently verified outcomes (improved

waste collection and reduction of solid waste disposed into the drainage system).

## 8. Ghana Secondary Cities Support Program (P164451)

- **Country:** Ghana
- **Financing amount:** US\$100M
- **Financing instrument:** PforR
- **Preparation and implementation duration:** September 2018–Expected December 2025
- **PDO:** To improve urban management and basic urban services in participating municipal assemblies.
- **Overall activities and RBF component description:** The program involves three arms: local, regional, and national. At the local level, urban development grants are available for municipalities to invest in urban infrastructure and service delivery and capacity support grants are for municipalities to invest in institutional and capacity development initiatives aimed at enhancing their urban management performance. At the regional level, funds are available to backstop, mentor and monitor regional jurisdictions and ensure that their assessments results are up to national average scores. At the national level, funding is available to strengthen their policy, support and monitoring functions with respect to urban management and development, as well as funding to manage annual performance assessments.

At all levels, the program is premised on results-based institutional performance.



Incentives for all levels of government to deliver on their mandates are integral to the Program's design, and DLIs will provide incentives for all three levels of government concurrently to improve urban management and basic service delivery.

### 9. Gaza Solid Waste Management Project (P171328)

- **Country:** West Bank and Gaza
- **Financing amount:** US\$3.25M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** March 2014–November 2020
- **PDO:** To improve solid waste management services in the Gaza Strip through provision of more efficient, environmentally and socially sound waste management systems.
- **Overall activities and RBF component description:** The project was organized under four main components: (i) Solid Waste Transfer and Disposal Facilities; (ii) Institutional Strengthening; (iii) Primary Collection and Resource Recovery; and (iv) Project Management. The design of the project ensured the key infrastructure investments supported under Component 1 are complemented by a comprehensive institutional strengthening and capacity-building program (Component 2) and studies that focused on the optimization of primary collection and resource recovery (Component 3) aimed at improving service provision at the different stages of solid waste management service chain.

The project incorporated results-based payments for SWM cost recover and quality improvements in disposal service (landfill), transfer station services (secondary collection services), medical waste treatment services, and secondary collection services (container upkeep and truck maintenance). The performance targets were independently monitored and verified to trigger the results-based payments.

### 10. Cheesemanburg Landfill and Urban Sanitation Project (P173261)

- **Country:** Liberia
- **Financing amount:** US\$16.7M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** June 2017–June 2024
- **PDO:** The development objective of this operation is to support increased access to SWM services in Monrovia.
- **Overall activities and RBF component description:** The project's additional funding was to finance additional costs in the following areas: financing additional costs in the following areas: (i) a financing gap in the construction of the Cheesemanburg Landfill and adjacent facilities; (ii) additional collection equipment; (iii) an RBF subsidy to support waste collection and disposal; (iv) enhanced monitoring and evaluation to support RBF payments for services; and (v) enhanced community support program.

The RBF subsidies were provided to the SWM service providers to support partially



the waste collection and disposal cost. This transitional subsidy supported service quality improvements and supplemented service fee collection in the primary and secondary collection, provided that the service meets minimum quality standards. The subsidy was calculated to gradually phase out as the cost recovery increases every year. Quarterly subsidy allocations to the service providers from the RBF designated account were calculated based upon the IVA assessed score.

### 11. Kerala SWM Project (P168633)

- **Country:** India
- **Financing amount:** US\$105M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** March 2021 – June Expected 2027
- **PDO:** To strengthen the institutional and service delivery systems for solid waste management in Kerala.
- **Overall activities and RBF component description:** The project will support a hybrid approach of decentralized and centralized solutions to improve SWM service delivery, and comprises three components: (i) institutional development, capacity building and project management; (ii) grant support to urban local bodies for improving their SWM systems and capacities; and (iii) development of regional SWM facilities.

The project couples technical assistance with incentive grants to urban local bodies for undertaking key institutional reform actions and investments that are critical

to strengthening their capacity for delivering SWM services. Moreover, the project enables performance-based contracts with SWM service providers as well as operations and maintenance payments for performance-based contracts and tipping fees for regional disposal.

### 12. Maputo Urban Transformation Project (P171449)

- **Country:** Mozambique
- **Financing amount:** US\$100M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** December 2020 – Expected April 2026
- **PDO:** To improve urban infrastructure and strengthen institutional capacity for sustainable urbanization in Maputo.
- **Overall activities and RBF component description:** The project's uses a phased implementation strategy sequencing activities based on priorities, technical complexity, and implementation readiness. The project includes five core components: (i) informal settlement upgrade to reduce the incidence of recurrent flooding, increase access to safe water and sanitation, and improve accessibility; (ii) Maputo City Center rehabilitation to improve flood resilience and socioeconomic inclusion; (iii) sustainable urban growth in areas with high projected growth, including SWM infrastructure improvement; (iv) project implementation and institutional support; and (v) establishing a contingent emergency response system.



The project includes PBCs in several of the project areas, including in SWM system improvement. This PBC will be disbursed proportional to the results achieved on (a) improvement in cost recovery ratio; (b) number of informal waste pickers whose livelihoods were restored; and (c) volume of waste reused or recycled improved.

### 13. China Plastic Waste Reduction Project (P174267)

- **Country:** China
- **Financing amount:** US\$430M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** June 2021–Expected December 2027
- **PDO:** To improve plastic waste management at the national and sub-national level, and to reduce plastics pollution from municipal solid waste.
- **Overall activities and RBF component description:** The project comprises four components: (i) national policies and institution strengthening; (ii) sub-national and local technical assistance and capacity building; (iii) improvements to SWM management, reduce plastic leakages from waste streams, and increase resource recycling; and (iv) project management, monitoring and evaluation.

The project supports a novel phase of Output-Based Incentives Payment (OBIP) to encourage participation in waste separation, and improve the quality of segregated waste by households. The

new OBIP scheme will employ AI technologies in smart trash bins/cabins for monitoring of residents' waste separation performances and for quality verification at drop-off, and blockchain technology for data processing, performance rating, and incentive matching. The Bank's OBIP financing will cover approximately 2,000 communities located at all the 8 districts in Ningbo urban areas with durations of 2 years for other wastes separation and 1 year for recyclables beginning the distribution of smart cabin.

### 14. Msimbazi Basin Development Project (P169425)

- **Country:** Tanzania
- **Financing amount:** US\$200M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** September 2022–Expected June 2028
- **PDO:** To strengthen flood resilience and integrated urban development in an economically important and flood prone area of the Msimbazi river basin in Dar es Salaam.
- **Overall activities and RBF component description:** The project includes the following components: (i) Msimbazi River basin development infrastructure to reduce the impacts of flooding; (ii) preventative resettlement of low-income flood-prone communities; (iii) strengthening institutions for resilient urban development; project management; and contingent emergency response. The first project component involves (a) implementing a community-led

SWM and litter control program, including provision of equipment, construction of materials-recovery facilities, design and implementation of a communications campaign, and upgrading of SWM/collection contracts and (b) financing improved solid waste collection/recycling contracts through performance-based payments schemes.

Solid waste service financing payments will be based on verified results achieved in: (i) contracts between the local authorities and the community cooperative for collection and recycling activities in selected informal communities; (ii) contracts between local authorities and contractors for collection and recycling activities in other areas. The payments will be made based on agreed prices corresponding to a portion of the incremental costs of: (i) waste diverted from landfilling through recycling and composting (US\$/ton); and (ii) waste collected at increased frequency and coverage (US\$/collection).

#### 15. Chennai City Partnership: Sustainable Urban Services Program (P175221)

- **Country:** India
- **Financing amount:** US\$150M
- **Financing instrument:** PforR
- **Preparation and implementation duration:** September 2021–Expected December 2026
- **PDO:** To strengthen institutions and improve quality and financial sustainability of selected urban services in the Chennai Metropolitan Area.

- **Overall activities and RBF component description:** The program involves three main areas: (i) strengthening institutions and systems for service delivery in public health care, SWM, bus services, and water supply and sewerage; (ii) enhancing quality of urban services; and (iii) improving financial sustainability of service agents. With respect to SWM, the program aims to strengthen the institutional systems for planning and delivery of integrated municipal SWM services with a specific focus on dry waste recycling and resource efficiency. This activity will support the long-term integrated planning, management, and performance monitoring of SWM services by GCC, to ensure that all performance-based waste management service contracts deliver good quality and socially inclusive services.

#### 16. China Plastic Waste Reduction Project 2 (Shaanxi) (P176989)

- **Country:** China
- **Financing amount:** US\$250M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** March 2023–Expected December 2029
- **PDO:** To inform plastic waste management at the national level, improve plastic waste management at the sub-national level, and reduce plastics pollution from municipal solid waste in selected underserved areas.
- **Overall activities and RBF component description:** The project will support the implementation of an integrated



urban-rural waste management system in Shaanxi province, and is structured along three components: (i) strengthening plastic waste management institutions and capacity building; (2) improvement of the SWM and agricultural plastic waste in underserved areas; and (iii) project management, and monitoring and evaluation.

Under the second component, the project will invest in output-based aide (OBA) mechanisms for farmers and/or cooperatives to deliver used agricultural mulch films and plastic from greenhouses to market outlets and private recyclers, in order to increase its collection and recycling rate. The design of the agri-plastic waste system will benefit from MARA's ongoing pilots of mulch film collection across China. It will include data management and traceability system to monitor performance and compliance as well as costs of the system.

### 17. Second Additional Financing – Yemen Integrated Urban Services Emergency Project II (P181053)

- **Country:** Yemen
- **Financing amount:** US\$19.5M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** June 2023–December 2025
- **PDO:** To restore access to critical urban services and strengthen resilience to shocks in selected cities within the Republic of Yemen.
- **Overall activities and RBF component description:** The additional financing and

associated restructuring is effectively a scale-up of the activities supported by the parent project (P172791), with a greater focus on enhancing SWM services. Namely, this AF: (i) increases financing for the first component of service restoration, particularly for tertiary municipal services and SWM services to address unmet and urgent needs; and (ii) additional implementation support and capacity development in the second component.

The AF adds an RBF subcomponent under the second component on implementation support and capacity development to support the restoration and possible expansion of pre-conflict SWM services in the cities of Sana'a, Aden and Al Mukalla. The RBF payments will be disbursed to UNOPS, and through UNOPS to the city cleaning and improvement funds (CCIFs), upon the achievement of indicators. The RBF payments will be used to subsidize the increased operational costs borne by CCIFs, associated with the expanded and improved SWM services for 2 years. The indicators are categorized under the following themes: enhancements in the quality of SWM, improved financial sustainability, and inclusivity of the program. The indicators will be verified independently semi-annually.

### 18. Solid Waste and Plastic Management Improvement Project (P170976)

- **Country:** Cambodia
- **Financing amount:** US\$60M

- **Financing instrument:** IPF
- **Preparation and implementation duration:** May 2023–Expected 2029
- **PDO:** To improve solid waste and plastic management and capacity in selected cities and nationally in Cambodia.
- **Overall activities and RBF component description:** The project encompasses four components: (i) national policy and institutional capacity development; (ii) technical assistance support and capacity building for participating pilot municipalities; (iii) investment program for participating pilot cities; and (iv) program management, monitoring, and evaluation.
- The project will increase the technical and organizational capacity of participating pilot municipalities to improve the performance of private solid waste collection services via performance-based indicators in service contracts allowing for payments to the private solid waste collection companies for waste collection services rendered. The project will improve the financial sustainability of SWM through local government regulations and incentivizing municipalities' collection of waste fees from households, as well as increase the awareness and citizen engagement in SWM.

## 19. Clean and Resilient Environment for Blue Sea Project (P176163)

- **Country:** Albania
- **Financing amount:** US\$80M
- **Financing instrument:** IPF
- **Preparation and implementation duration:** December 2023–Expected March 2030
- **PDO:** To reduce pollution from land-based sources into the aquatic environment in selected areas of the South-West Coastal Belt of Albania.
- **Overall activities and RBF component description:** The project involves four components: (i) promote integrated and circular approaches to SWM; (ii) reduce water pollution in the Vjosa River; (iii) promote behavior change and circularity for pollution reduction; and (iv) project management and monitoring and evaluation.

The behavior change activities of the third component are designed to enhance pollution prevention by (a) incentivizing municipalities to improve waste management services, (b) encouraging vulnerable households to adopt improved sanitary practices, and (c) further engaging the public and relevant stakeholders with awareness campaigns and school programs.





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