

RESULTS-BASED FINANCING FOR MUNICIPAL SOLID WASTE

EXECUTIVE SUMMARY

Municipal solid waste (MSW) management is a crucial service provided by cities around the world, but is often inefficient and underperforming in developing countries. It is estimated that cities generated approximately 1.3 billion tons of MSW worldwide in 2010, and this is expected to increase to 2.2 billion tons by 2025. The challenges that cities face regarding their solid waste management systems vary, but generally depend on their financial capacities. Low income countries face the most acute challenges with solid waste management. In low income countries, cities collect less than half the waste stream. Of this, only about half is processed to minimum acceptable standards. Improving MSW in cities offers a high economic rate of return and significant environmental and public health benefits which contribute to overall city livability and competitiveness. At the global level, improving MSW also contributes to climate change mitigation through the reduction of methane emissions.

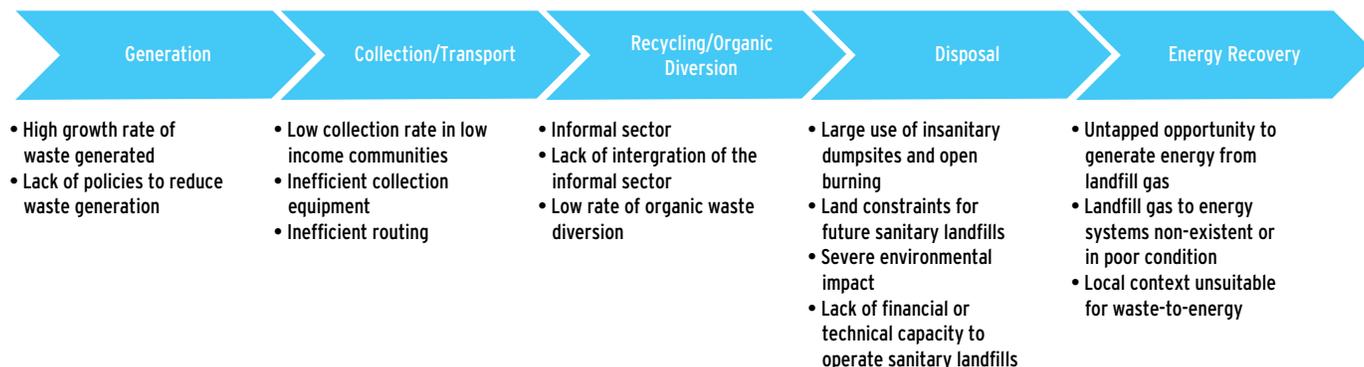
The World Bank's portfolio between 2000 and 2012 included 114 active projects in 58 countries in all regions, representing

US\$1.27 billion in investments, with a further 55 analytical and advisory activities. Despite this significant portfolio, the existing global annual US\$40 billion shortfall for MSW requires the World Bank to reconsider its approach to MSW and leverage innovative instruments and partnerships to increase its impact on the sustainability and quality of the MSW sector. In this regard, since 2012 the World Bank has been exploring the application of results-based financing (RBF) in the solid waste sector as an instrument to improve MSW services and outcomes.

Results-based financing for MSW is a financial mechanism through which the payment for solid waste services is conditioned to the achievement and verification of pre-agreed targets. A basic feature of RBF is that financial payments or in-kind rewards are provided to a service provider conditional on the recipient undertaking a set of pre-determined actions or achieving a pre-determined performance goal. RBF offers opportunities to innovate in the use of development finance in the solid waste sector and to achieve results.



Figure 1: Common Challenges along the MSW Value Chain



Until recently, RBF principles and designs had not been widely applied in the solid waste sector, apart from the use of some performance-based contracting with private providers of solid waste services and carbon finance for methane mitigation. Given existing weaknesses and the challenges that cities face regarding solid waste management and service delivery, RBF can benefit the sector by ensuring that public funds are used efficiently and transparently.

This report provides eight examples of RBF designs, each tailored to the specific context and needs of the solid waste sector in the specific city or country. These projects are currently in various stages of preparation or implementation; hence,

lessons can be inferred only in terms of how solid waste projects can be developed using RBF principles.

The eight examples could be classified into three main categories: (a) **RBF to improve solid waste service delivery and fee collection:** in Nepal and the West Bank, the projects use RBF subsidies to improve the financial sustainability of MSW services by increasing user fee collection while simultaneously improving waste collection services; (b) **RBF to promote recycling and source separation:** in the cases of China, Indonesia, and Malaysia, an “incentive payment” model is used to improve source separation and collection of waste through changes in behavior at the household level; and (c) **RBF to strengthen waste collection and transport in under-served**

Figure 2: Cities Where Work Was Undertaken



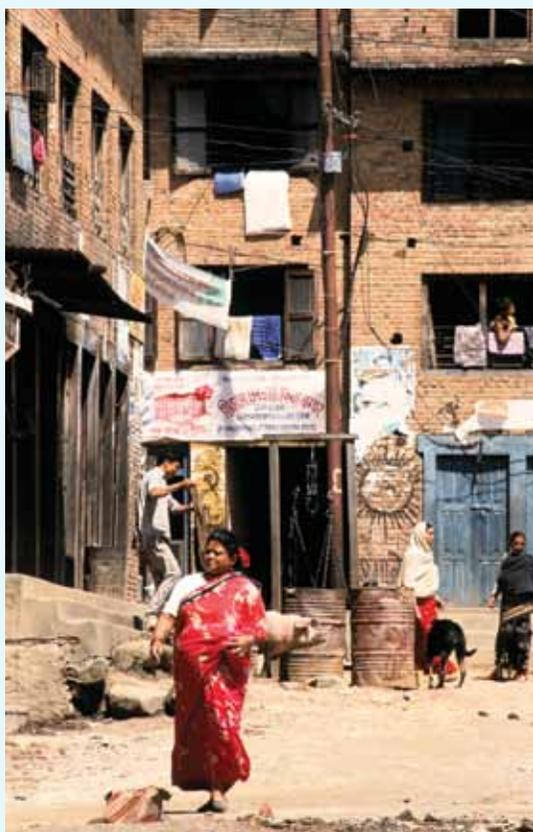
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communities: in Mali and Tanzania, projects were designed to strengthen secondary waste collection and transport for under-served communities. In the case of Jamaica, the project was designed to improve waste collection in inner-city communities and to encourage waste separation as well as general neighborhood cleanliness.

These models of RBF could be adapted to the context of other countries. The **RBF model to improve solid waste service delivery and fee collection** is an appropriate model for low income countries where service delivery is poor or non-existent or where fee collection to support waste collection and disposal is a major challenge. It is also an appropriate model to jump start the solid waste services in fragile and post-conflict situations. The **RBF model to promote recycling and source separation** is a good model for cities in middle income countries where the collection of waste is already high but where the effort of

the government is focused on improving the financial and environmental sustainability of the sector. The **RBF model to strengthen waste collection and transport in under-served communities** is applicable to both low and middle income cities but is most relevant where the focus is to improve solid waste services in under-served and low income communities and could be part of community and slum upgrading projects.

RBF is not a panacea for the solid waste sector and is more efficient when associated with other instruments such as infrastructure investment, policy reform and technical assistance. The eight RBF examples presented in this report address some of the fundamental problems associated with solid waste management in developing countries, such as: fee collection, behavior change towards source separation of recyclable and organic waste, and access to service in underserved communities. However, RBF alone is not a universal solution to all the



RBF in Nepal's MSW Sector "At-a-Glance"

Solid Waste Situation. Nepal's cities are rapidly growing: urbanization rates are more than 3.5 percent per year. This population pressure exacerbates the existing challenges in municipal solid waste services. Of the 700,000 tons of waste that cities generate each year, less than half is collected and most of the collected waste is informally dumped. Waste collection is irregular and done in an ad hoc manner, resulting in hazards for both population health and the environment.

Problem Statement. Solid waste collection is defined by low levels of service coverage and weak financial sustainability. Without increasing revenues from solid waste management (SWM) services, municipalities cannot finance improvements to service provision. At the same time, there is low willingness to pay among residents.

Design Solution. An output-based subsidy is given to the participating municipalities (Dhankuta, Tansen, Lekhnath, Pokhara, and Lalitpur) to help bridge the gap between the cost (including capital costs, operations and maintenance costs, overheads and other expenses) of delivering improved SWM services and the revenues that municipalities collect for SWM services. Payment of the subsidy is linked to improvements in services. The amount of the subsidy is designed to decrease over time, as services improve and fee collection increases to contribute toward final cost recovery. Implicit in this design is the assumption that residents' willingness-to-pay increases as there are visible improvements in service coverage and delivery.

The outputs measured relate to improved quality of services and improved financial sustainability of the service provider. Upon verification of these outputs each year, the amounts of the subsidy are determined based on a pre-established multiplier and are subject to a maximum amount. This multiplier is based on target levels of cost recovery and long-term municipal subsidy levels. Over the project timeline of four years, the multiplier varies so that by the end, there is no subsidy required for the city to continue service provision in a financially sustainable (fee-based) way.



RBF in Malaysia’s MSW Sector “At-a-Glance”

Solid Waste Situation. Penang State, Malaysia is comprised of two highly urbanized parts—Penang Island and Seberang Perai on the Malaysian Peninsula. Penang Island’s population of 750,000 residents and Seberang Perai’s population of about 815,767 residents generate about 288,377 and 528,275 tons of waste per year, respectively. Existing landfill capacity is rapidly decreasing with the amounts of waste currently generated, collected and disposed.

Problem Statement. Of Penang’s waste, approximately 40-60 percent is organic waste (food and yard wastes). Organic waste that is landfilled releases greenhouse gases like carbon dioxide and methane that contribute to global warming. A significant portion of waste is from residential high-rise buildings and yet most residents in Penang, including those in these complexes, do not separate their organic wastes.

Design Solution. “Incentive payments” (i.e., cash awards) are given

to participating high-rise communities if they successfully separate organic waste from all other wastes. Separated organic waste will be evaluated on pre-determined quality and quantity measures, such that communities will receive a final overall score. The communities, through organized high-rise management committees (HMCs), will receive an incentive payment based on this score, subject to both a minimum score and a maximum incentive payment ceiling. The program cycle is four months long, with two months of evaluation.



RBF in Jamaica’s MSW Sector “At-a-Glance”

Solid Waste Situation. The Kingston Metropolitan Area (KMA) has a population of about 579,137 residents. It generates about 420,000 tons of waste per year. The National Solid Waste Management Authority (NSWMA) is in charge of solid waste collection, but this service is poor due to the authority’s inadequate capacity and budget shortfall. Service is notably worse in inner city communities due to an insufficient number of trucks, a lack of storage facilities, and the unplanned nature of these areas.

Problem Statement. There is insufficient and irregular waste collection in inner-city communities. Community and dumpster areas are ill-maintained and unclean. Moreover, waste separation (of recyclables and organic materials from other waste) is limited.

Design Solution. In-kind incentives (waste collection trucks) are given to the NSWMA if they provide sufficient and regular waste collection services. Sufficient collection is defined by visual evaluations of dumpsters to determine if they are less than 75 percent full. Regular collection is defined by comparison of the actual versus required number of collection pick-ups. Financial incentives are given to Environmental Wardens and community-based organizations (CBOs) if separated recyclables and organics meet a targeted weight and if qualitatively, communities and areas around communal waste dumpsters are sufficiently clean. All quality evaluations are conducted visually using pre-established photographs as benchmarks.

The scheme is 36 months long; evaluations are conducted every three months. Subject to their performance, the NSWMA earns a waste truck at year 2 and 5, the Environmental Wardens earn a 10 percent salary bonus every three months, and the CBOs earn between US\$1200 and \$2400 every 6 months.

challenges that cities in developing countries face regarding solid waste management—it is more effective when associated with other instruments.

Lessons Learned

Several important lessons emerged from the preparation of the eight case studies. This report presents the challenges faced in the design and implementation phases as well as general recommendations on how to address such challenges in future projects. Some of the lessons learned and recommendations are generally applicable to the preparation of any MSW project, whereas others are particular to the design of RBF projects for MSW. The main lessons learned are summarized below:

General Lessons and Recommendations for Using RBF for MSW

- **Collecting sufficient baseline information is essential to developing an RBF design that addresses the needs of the sector.** In all eight case studies, baseline studies provided the team with good insight into the situation and challenges of the solid waste sector before a tailored RBF solution was proposed. Because MSW practices generally vary from one city to another, the design of RBF solutions for the waste sector must include an analysis of the sector as a whole to avoid unintended consequences on the other parts of the system.
- **RBF solutions for MSW require active involvement of all stakeholders from the early stages of project preparation in order to be successful.** The team undertook community and stakeholder consultations and surveys in all eight countries where the RBF was proposed. These stakeholder consultations have appeared to be a valuable tool to engage the service providers and beneficiaries as well as the government.
- **Getting the project prerequisites right, in early project implementation stages, is essential.** Even though RBF is not a panacea for the solid waste sector, it could provide an avenue through which important sector reforms are facilitated. In Nepal for example, these prerequisites included establishing and institutionalizing SWM subject committees and operational units, preparation of SWM strategies and service improvement plans (SIPs), and establishment of performance and service delivery monitoring systems, etc.



- **Improving SWM services does not always require more staff, more vehicles, more equipment, or bigger landfill space.** RBF for MSW could be designed in such a way that enables it to achieve its objectives using the available technical and human resources. This could be achieved by designing simple, robust, and affordable systems that can be easily managed and maintained by current staff.

Considerations for Designing RBF Projects for MSW

- **In the solid waste sector, OBA subsidies may be more effectively targeted at municipalities rather than individual households.** The lesson from the project in the West Bank was that attempting to target low income households for OBA subsidies may not be feasible in the solid waste sector because it is a shared, community-based activity. Improving the situation of solid waste management as a whole has a more positive effect on the urban poor—who generally live near improperly disposed solid waste. Also, a large number of informal waste pickers are from poor communities.
- **RBF designs should be carefully aligned toward achieving the intended improvements in solid waste outcomes.** Any RBF scheme should be designed, as far as possible, to motivate the right players to achieve the intended outcomes, because misalignment between who is performing and who is being paid could be detrimental to the success of an RBF project. In Indonesia,

RBF payments could not be made to waste banks and communities whose behavior change was targeted by the project due to fiduciary arrangements; as an alternative, the RBF was designed to provide payment to municipalities as the closest public entity capable of creating the enabling conditions to stimulate the behavior change.

- **When an RBF scheme is designed as a payment mechanism for solid waste services, the payment should fairly compensate the service received; however, if it is for individual noncommercial behavior change, the payment should be linked to the value of the outcome of the desired behavior change.** RBF projects where the service provider is paid for collection could be based on a competitive bidding process or direct negotiations with the incumbent service provider. RBF projects where residential communities are paid for recycling could be based on how much cost-savings the municipality achieves through reduced costs in solid waste collection, transport, and disposal.
- **Providing up-front financial assistance to service providers with limited access to credit could facilitate the implementation of RBF projects.** An RBF scheme with an unbalanced sharing of responsibility and risks between the public authorities and the private sector could discourage private sector engagement. In Tanzania, the RBF design would have provided some equipment for collection through the World Bank investment project, to overcome the lack of access to credit. This issue is even more acute in fragile countries where investment presents a high risk to the private sector.
- **RBF projects must be designed with a focus on a set of desired results, allowing the service providers to decide what service delivery model would best achieve those results.** RBF projects for diverse communities should be designed in a manner that allows participating municipalities to design to their specific needs. Additionally, the experience from Nepal has highlighted the need to ensure that any results indicators are under the full responsibility of the implementing agency, that the indicators are well-defined and independently verifiable, and that project designs reflect pragmatic levels of risk transfer.



Monitoring and Independent Verification of RBF Schemes for MSW

- **Balancing simplicity and meaningfulness in the design of the verification process is often a practical necessity for implementation in the solid waste sector.** The verification mechanism for RBF projects should not be so cumbersome that it results in excessive transaction costs. End results should thus be verified through simple and straightforward protocols. For example, the design of any scorecards or formulae to calculate the payments should consider limited local capacities, and therefore be easy for all parties to understand. Also, periodic random performance evaluations could be used instead of daily performance evaluation.
- **A third party independent verification agent (IVA) provides greater transparency but could also be costly; alternative means of verification could be considered to minimize the cost in the solid waste sector.** In China and Jamaica, alternative verification agents were considered in lieu of an independent firm to reduce the transaction cost. A verification process that is very costly cannot be sustainable in the long run, particularly in the solid waste sector which is often struggling with the financial sustainability of operations in the first place. One alternative would be to use a city's own monitoring and verification system, which has the added benefit of strengthening local capacity in this area which is often weak to start with.

Ensuring Successful Implementation of RBF for MSW

- **Supplementing financial subsidies with educational outreach and technical assistance provides greater leverage for RBF projects.** Although RBF is about paying for the results and shifting performance risks to the service provider/implementing agency, experiences from Nepal and West Bank have shown that technical assistance is needed to ensure the achievement of the performance targets. Technical assistance resources should therefore be included as part of any RBF project to enhance the basic capacity for service delivery.
- **Linkages to investment projects provide more leverage for implementation of RBF schemes in the solid waste sector.** All eight of the schemes described in this report were linked at some stage to related solid waste investments. These linkages provided added momentum for implementation, although they also brought the risk of delay or cancellation if the investment projects did not go ahead.
- **The institutional arrangements and flow of funds for RBF projects must be simplified as much as possible, taking into account the capacity of the implementing agency.** The diagrammatic representation of the institutional arrangements and flow of funds for the RBF project in Nepal is complicated and difficult to explain. Institutional arrangements and flow of funds are important factors during implementation and must be presented in a manner that could be easily understood by the implementing agency, the beneficiaries, and the independent verification agency.

Sustainability of RBF Projects

- **Keeping the big picture in mind helps ensure that the resulting scheme contributes to long-term sustainability in the solid waste sector overall.** The design of any solid waste management interventions, including RBF, should take into account the country's broader solid waste management context, from waste collection to final disposal, to ensure that the problem statement and the proposed solution are appropriate and to avoid unintended consequences or knock-on effects on other sectors. As far as possible, waste reduction, reuse and recycling initiatives should be prioritized.
- **Addressing solid waste challenges often involves fundamental changes in behavior that can take time**



to establish, so setting realistic targets is important in order to keep stakeholders motivated. The RBF designs in China, Malaysia and Indonesia attempt to improve solid waste management through the very difficult objective of behavior change among communities, which could take time to be effective. Expectations should be set for gradual improvements over time; otherwise, dissatisfaction and de-motivation may set in among recipients who fail to meet targets despite their reasonable efforts. Setting realistic targets is important in order to minimize the risk that people could go back to their original behaviors, or develop new unexpected ones, after the financial rewards or incentives are ended.

The report recognizes that the eight case studies did not cover some issues or activities such as waste generation, energy recovery or waste picking. There are opportunities to develop additional RBF concepts to address these other issues or to address the same issues from a different perspective. The following additional concepts are suggested for consideration for future RBF projects in the solid waste sector:

- Providing incentives to households to reduce the quantity of waste generated at source (impacting the choice of manufactured products with less packaging); including conditional cash transfers to waste pickers;

- Implementing performance-based operating contracts for the management of waste facilities by the private sector (e.g., landfill, waste-to-energy, compost facility, transfer station, materials recovery facility (MRF), etc.)
- Utilizing performance-based grants to municipalities for reducing methane and black carbon from the solid waste sector; and
- Providing solid waste service fee vouchers to poor households.

This work represents the first phase of a programmatic undertaking to pilot the use of RBF in the waste sector to tackle critical challenges faced by cities with respect to solid waste management. The focus of this first report has been on the lessons learned from the preparation and design of RBF to address specific solid waste issues. Even though these designs have

undergone peer reviews or review by a GPOBA panel of experts, there is a need to see how they will be implemented.

Moving forward, a second phase of this work is planned to start in fiscal year 2015 and will have three main objectives:

- Continue to assess the implementation of the various designs presented in this report to infer lessons revealed during implementation and from the subsequent adjustments made to the designs;
- Design new RBF undertakings in additional cities, some of which would consist of replicating or adapting the existing models while others would attempt to design entirely new solutions; and
- Disseminate the findings from this phase to decision-makers and donors.



Copies of the Executive Summary and the full report are available at:

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