An Economic Analysis of Solid Waste Management Outsourcing in Myanmar

The Asia Foundation

Acknowledgements

I would like to thank everyone who contributed to make this research possible, notably the members of municipal authorities of Taunggyi, Hpa-An, Pyin-Oo-Lwin and Monywa who went out of their way to share their knowledge. I would like to thank James Owen from The Asia Foundation for his guidance throughout and for the support provided by the other members of the municipal reform team, especially Tun Thet Aung, Yu Zin Htoon, Moe Moe Sann, and Thin Yee Mon Su.

We were also aided by municipal waste management experts Friedor Jeske and Thibbaut Le Loc'h from the non-governmental organizations Thant Myanmar and GRET, respectively, who provided valuable insights into the solid waste management supply chain in Myanmar.

I would also like to thank our partners at the Renaissance Institute for their support for this research. We received research support from Arkar Hein and Ye Khaung Oo as well as valuable feedback from Dan Jollans, Andrew Wilson, and Ildrim Valley.

Lead researcher and author:
Anders Kirstein Møller
Core research team and lead contributors:
James Owen and Tun Thet Aung
Design and graphics:
Wai Yan Myo Myint & Tun Thet Aung
Copy-editing:
Sandy Barron
Photo credits:
Tun Thet Aung and Anders Kirstein Møller

Funded By

UKaid

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

Australian Government
Department of Foreign Affairs and Trade

Preface

Myanmar's municipalities, namely the Development Affairs Organizations and City Development Committees, are responsible for the provision of urban services such as roads, piped water and solid waste management. Effective management of these public goods is critical for ensuring that cities are productive places that promote health and well-being.

While governments may bear ultimate responsibility for the provision of a service, the question arises whether government should directly provide that service, or whether it could be better provided and managed by private contractors, community groups or individuals. This is one of the most important policy decisions that municipalities must make. In Myanmar, municipal authorities have begun this process; yet in a context where all levels of government are still working out the appropriate boundaries between the state and market in a post-socialist economy, they have little guidance and limited experience to draw on.

This paper seeks to support specific municipal decision-making on the provision of solid waste management. To address the limitations outlined above, the paper applies an economic perspective to the question of who should directly provide municipal solid waste collection services and brings together the lessons learned from decades of economics research on the 'outsourcing' of solid waste management. The paper collates a series of case studies from Myanmar and the region to better understand that context – and identifies some truly novel approaches. The findings of good practice feed into recommendations that we hope can be a guide to municipalities that are considering outsourcing or are looking to improve existing practice.

This research was generously funded by the United Kingdom's Department for International Development Aid, the Swiss Agency for Development and Cooperation, and the Australian Government's Department of Foreign Affairs and Trade. The opinions expressed in the report are solely those of the authors.

Matthew Arnold
Country Representative
The Asia Foundation
Yangon, January 2020

Glossary of Terms

Agency Problem – A situation where an "agent" (which can be an individual or group) operating on behalf of a "principal" (which can be an individual or group) has a motive to act in contradiction to the principal's best interests.

Collective Action Problem – A situation in which all individuals would be better off cooperating but fail to do so because of conflicting interests between individuals that discourage joint action.

DAO – Development Affairs Organization, municipal authorities in Myanmar responsible for a wide range of urban services but principally focused on delivering public works (such as roads, drainage and bridges), waste management and local business governance.

Diseconomies of Scale – When larger production processes result in higher cost per unit of output.

Economics - The study of how societies or groups of people allocate scarce resources amongst many competing needs.

Economies of Scale – When larger production processes result in reduced cost per unit of output

Firm – a for-profit business organization.

Free-riding – Is when an individual benefits from the provision of public goods service, but does not pay their share of the cost of these services. When this happens, it can result in an under-provision of those services, known as the free-rider problem.

Heterogeneity – When there are many differences across the individual units being studied, such as people, organizations or countries, which makes it difficult or impossible to generalize.

Incentives – The things that motivate an individual, group or organization to act in a certain way.

Incomplete Contracting – The idea that no contract between two entities can ever be

complete because it cannot possibly specify conditions for every conceivable contingency, which creates possibilities for opportunistic behavior by either one or both parties.

Information Asymmetry – A type of market failure that arises when one party to an economic transaction has more or better information than the other.

(Local) Natural Monopoly – Can occur when a market has high upfront costs that must be recovered over long periods of time and by serving a large number of people, thus making it inefficient or impossible to have multiple firms operating at the same time.

Markets – the means by which buyers and sellers come together to exchange goods or services. These markets are not physical in nature.

Market Failure – A scenario where the allocation of resources in a competitive market leads to social welfare loss.

Market Mechanisms – The ways in which market actors behave to maximize their returns, such as firms competing to maximize profits.

MSW – Municipal Solid Waste, which refers to all physical, non-liquid items that are discarded by the public in an urban area.

Outsourcing – When an entity contracts an external actor to provide a good or service for them. Outsourcing is different from privatization as it does not involve the transfer of property or business from government to a private entity.

Primary Collection – The collection garbage from the point of generation, i.e. a household or business, from where it is either transported to a transfer station or directly to a landfill.
Secondary Collection – The transportation of a larger amount of garbage from a transfer station to a landfill.

SWM – Solid Waste Management, which refers to the collection, treatment, and disposal of all solid waste material, in both urban and rural areas. Akin to MSW Management.

Transaction Costs – A theoretical perspective which, similar to Agency Problems, analyses business interactions in terms of the costs that arise from attempting to overcome information asymmetries. These include the design, negotiation, monitoring, and enforcement of contracts, and the cost of managing all these exchanges.

Table of Contents

I. Introduction

Economics is the study of how societies allocate resources amongst their many competing needs. The discipline has developed many different "models", ways of thinking about the world, in an attempt to understand and guide decision-making. This paper applies the theory and evidence gathered from decades of economics research to the issue of solid waste management collection in Myanmar. By combining evidence from other countries with an appreciation of actual practice in Myanmar, the paper aims to guide Myanmar's municipalities in their decisions as to who should collect solid waste in a post-socialist economy, and how.

i. Urban Waste

Solid waste collection is one of the most important public services that a municipal government can provide. Without effective service provision, cities quickly become littered with garbage which is a significant health and environmental hazard. As noted by the World Bank, "a city that cannot effectively manage its waste is rarely able to manage more complex services." [1]

Box 1: Municipal Solid Waste

Municipal Solid Waste (MSW) consists of all everyday items, commonly referred to as trash or garbage, that are discarded by the public in an urban area.[2] It excludes liquid waste and industrial waste, which are outside the scope of this paper.[3] In Myanmar, MSW management is mainly carried out by municipal authorities, i.e. Development Affairs Offices (DAOs)

Effective Municipal Solid Waste (MSW) management is not easy or cheap. MSW systems represent a sizeable undertaking in terms of effective supply-chain management, purchasing and servicing vehicles, overseeing landfills, and continuous engagement with the public. All of this requires municipal governments to commit considerable organizational and financial resources. In Myanmar, similar to most lower- and middle-income economies, MSW management is one of the single largest current expenditure items for municipal authorities.[4] In Myanmar, cleansing departments of the DAOs earn revenues from garbage collection fees and occasional special collections, but rely heavily on subsidies from the main municipal budget. As shown in Table 1, for example, Taunggyi's cleansing department consistently accounts for roughly one-fifth of the DAO's total current expenditure, a sizeable – albeit decreasing – proportion of total expenditure.

Table 1: Taunggyi DAO Cleansing Department Budget from Fiscal Year 2014–2015 to 2017–2018 (in millions of kyats and as a proportion of total DAO expenditure). Source: Taunggyi DAO.

Taunggyi DAO	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18
Cleansing dep't, current expenditure	272	158	164	170
% of DAO current expenditure	26%	15%	19%	18%
% of DAO total expenditure	15%	8%	8%	4%

Waste disposal is a critical matter for general welfare, especially in developing countries where public service provision may be tightly constrained by budget limitations. Globally, an estimated 3.5 billion people – roughly half of the world's current population – lack access to waste management services.[5] This is not simply an aesthetic problem. According to the World Bank, "poorly managed waste has an enormous impact on health, local and global environment, and [the] economy."[6] The cost of treating these impacts is usually higher in the long term than what it would have cost to manage the waste properly in the first place.

Box 2: Myanmar Solid Waste Output at a Glance

Urban waste generation in Myanmar is rapidly rising. According to an estimate by the World Bank, MSW alone was estimated at 5,616 tons a day in 2012, and was projected to almost quadruple to 21,012 tons a day by 2025 due to urbanization and the MSW generation rate increasing from 0.44 to 0.85 kg/capita/day.[7] Other research indicates that waste output in the biggest urban centers is already rising rapidly, with Friedor Jeske (Thant Myanmar) for example calculating a waste output of 0.68 kg/capita/day for Mandalay City in 2017.[8] MSW in Myanmar largely originates from households (60 percent), markets (10 percent) and commercial producers (10 percent). It is primarily composed of organic waste (77 percent) with the rest consisting of plastic (13 percent), paper (7 percent), and others (3 percent). Note: the proportion of organic waste is slightly lower in major urban center (roughly 67 percent and 72 percent for Yangon and Mandalay, respectively), which see higher use of plastic and industrial waste.[9]

ii. Decentralization and Municipal Governance in Myanmar

Myanmar has recently embarked on significant decentralization reforms. Following the establishment of regional parliaments in the 14 states and regions in accordance with the 2008 Constitution, oversight of municipal governance was devolved to state and region governments in 2011. Although states and regions have oversight of DAOs, in practice the DAOs are relatively independent. The DAOs' mandate includes taking responsibility for providing a wide range of socio-economic services, although in practice the scope of actual activities is constrained. This is partly due to the fact that DAOs are largely self-financed and have a narrow revenue base, relying primarily on the sale of business licenses and minor transfers from state/regional governments.[10] Thus their main activities tend to be public works such as constructing and maintaining roads and drains, collecting solid waste, and providing governance of local businesses.[11]

Municipal authorities are in a unique position to improve local service delivery. Municipalities are primarily accountable to regional parliaments rather than central government. This means that DAOs are relatively free to experiment with new policies and development initiatives (within the confines of Development Affairs Laws passed by sub-national parliaments).[12] Given Myanmar's rapidly evolving public governance framework, this leaves DAOs with plenty of opportunity to experiment with different MSW management models which will need to be adjusted over time to fit each municipal government's unique circumstances.

Effective management of urban spaces will be vital for Myanmar's long-term sustainable development. The 2014 national census estimated that 30 percent of the population live in urban centers, which is the second-lowest rate in the Southeast Asia region. However, Myanmar is currently experiencing a relatively fast pace of rural to urban migration and urbanization, with the census population projections estimating that roughly a million more people will move to cities every five years between 2015 and 2030.[13] Urban centers are considered key sites for driving economic growth due to the agglomeration effect, which refers to the benefits accrued due to individuals and firms being in close proximity to one another.[14,15] Well-managed cities become drivers of innovation and "[allow] an inclusive and democratic society to emerge," while – conversely – poorly-managed cities risk becoming congested, crime-ridden, and disease-ridden.[16] Being able to maintain clean and healthy cities is therefore a key aspect of urban development.

Solid waste management, and illegal dumping of waste, is a major concern amongst municipal authorities in Myanmar. During stakeholder meetings between The Asia Foundation and members of a dozen DAOs, waste management was consistently mentioned as one of the most pressing issues that municipal governments are working to address.

Waste management in Myanmar as a whole is still at a preliminary stage[17] but with clear opportunities for improvements. The country currently enjoys strong economic growth, it already has a diverse recycling sector, and the recently reformed DAOs enjoy full authority over MSW management. According to a scoping mission report by the Netherlands Enterprise Agency, these factors create significant opportunities for 'quick wins' to jumpstart improvements in MSW management, such as sectoral capacity building, developing transfer stations,[18] and improving fee collection.[19] Such efforts could prove particularly effective if existing contracting and outsourcing issues are addressed.

Box 3: Outsourcing

In simple terms, outsourcing refers to when an entity contracts an outsider to provide a good or service. In the context of public administration; this is, when a government institution contracts a person or company from the private sector to provide a service instead of conducting the service itself with its own staff.

DAOs have been using their relative autonomy to experiment with new reforms in waste management. This is demonstrated by how at least nine townships or municipalities to date have used, or have considered using, outsourcing to deal with solid waste collection.[20] However, as pointed out by, for example, the Asian Development Bank (ADB), transitioning from public to private service provision requires a "substantial increase in tendering and contract management skills."[21] It is therefore important to evaluate these outsourcing experiments, particularly in light of their hitherto mixed results, to find ways of improving urban waste management in Myanmar.

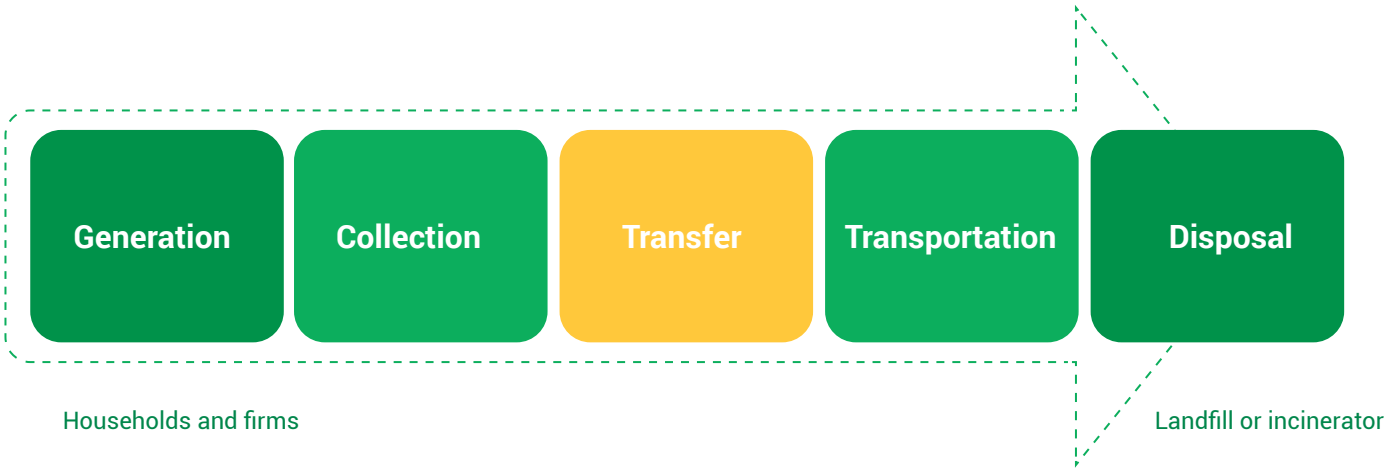
iii. Public Waste Management

Reforming waste management ties into fundamental questions from the field of public economics about who is responsible for collection, and how the service will be financed. One of the main responsibilities of a government, whether local or national, is to provide vital public services such as education, health care, and waste management. Public economics studies whether certain social welfare objectives are best achieved through market provisions, managed markets, or direct provision by the government. Decisions may be based on a variety of analyses of, for example, how different stakeholder incentives can be aligned, whether service provision by the private sector might suffer from market failures, and whether a government policy has positive or negative spillovers. Public economics also deals extensively with how to finance social welfare provisions, which for municipal governments is normally via a variety of property taxes, income taxes, central government transfers, and service-specific user fees.[22] As such, this paper poses some fundamental questions of relevance to policymakers about who – ultimately – is responsible for picking up waste, and how can this best be managed and financed.

Waste collection is an example of a public service which might be managed more efficiently via outsourcing to a private contractor. In theory, this is possible because the private sector has stronger incentives to innovate and cut costs. However, the profit incentive may also result

in lowered service provision due to so-called agency costs, or it can damage the social contract between a municipal government and the public, potentially making it harder to raise revenues for MSW management and other services. Much of the relevant economic literature on outsourcing has been written in the context of advanced economies with strong institutional capacity and mature markets. In Myanmar, both those conditions are often absent. This paper has therefore been written to reflect the economic context of Myanmar.

Figure 1: The MSW Management Chain, from Generation to Disposal. Sorting of garbage (to remove recyclables and/or organic material) is not shown as a discrete step because it can happen – formally or informally – at all stages of the MSW management chain. The scope of this paper is primarily focused on the different ways that DAOs in Myanmar manage the garbage collection stage, although the other aspects are occasionally referred to in textboxes and policy suggestions.



iv. The Study

This paper reviews some of the different waste collection models that are currently used by municipalities in Myanmar. Using the lens of outsourcing and economic theory, it explores how municipal waste collection may be reformed. The project began with a review of economic literature on municipal outsourcing, followed by a study of municipal waste collection models in other developing countries. This was contextualized by research on municipal waste collection in Myanmar using a case study approach. The preliminary findings were presented at two workshops held by The Asia Foundation and the Renaissance Institute in Mandalay and Taunggyi, involving a total of over 150 DAO officials from around the country, and their comments and suggestions have been incorporated into this paper.

Following this introduction, Section 2 provides a summary of municipal waste management practices in Myanmar based on four case studies. Section 3 highlights the dangers of poor contracting, and the benefits of community-based models, drawn from an analysis of two international case studies. Section 4 concludes with a summary of the report's findings. The Annex summarizes the relevant economic literature on MSW outsourcing.

2. Municipal Waste Collection in Practice

MSW management in Myanmar is a patchwork of different formal and informal systems, which vary in their fee structures, staff wages, equipment use, and levels of private-sector and community involvement. Overall, it can be said that most DAOs in Myanmar are struggling with high demand, low capacity, and limited funding. This section offers a brief summary of MSW practices followed by four Myanmar and two international case studies. The case studies form the basis for the analytical model of MSW practices in Myanmar presented in Section 3, together with a list of advantages and disadvantages of different approaches.

Box 4 :The Benefits of Organizing Primary and Secondary Waste Collection

*In MSW management, **primary collection** is the collection of waste from the point where it is placed by those who produced it – for example, inside or outside a house, or in communal waste bins – from where it is either transported to a transfer station or to a landfill. **Secondary collection** refers to when a larger amount of waste accumulated through primary collection is taken from a transfer station to the landfill. The main advantage of dividing MSW management into primary and **secondary collection** is that it saves time and money on transporting waste to landfill sites: smaller collection trucks can cover more areas, while larger trucks can make more frequent trips to the landfill. This also saves wear and tear of infrastructure, including roads. In the long run, good development of primary collection using low-cost equipment such as waste bins, manual push-carts or three-wheeled trucks can be a vital foundation for effective waste management as it becomes the basis for segregating household waste (see the Surabaya, Indonesia case study).*

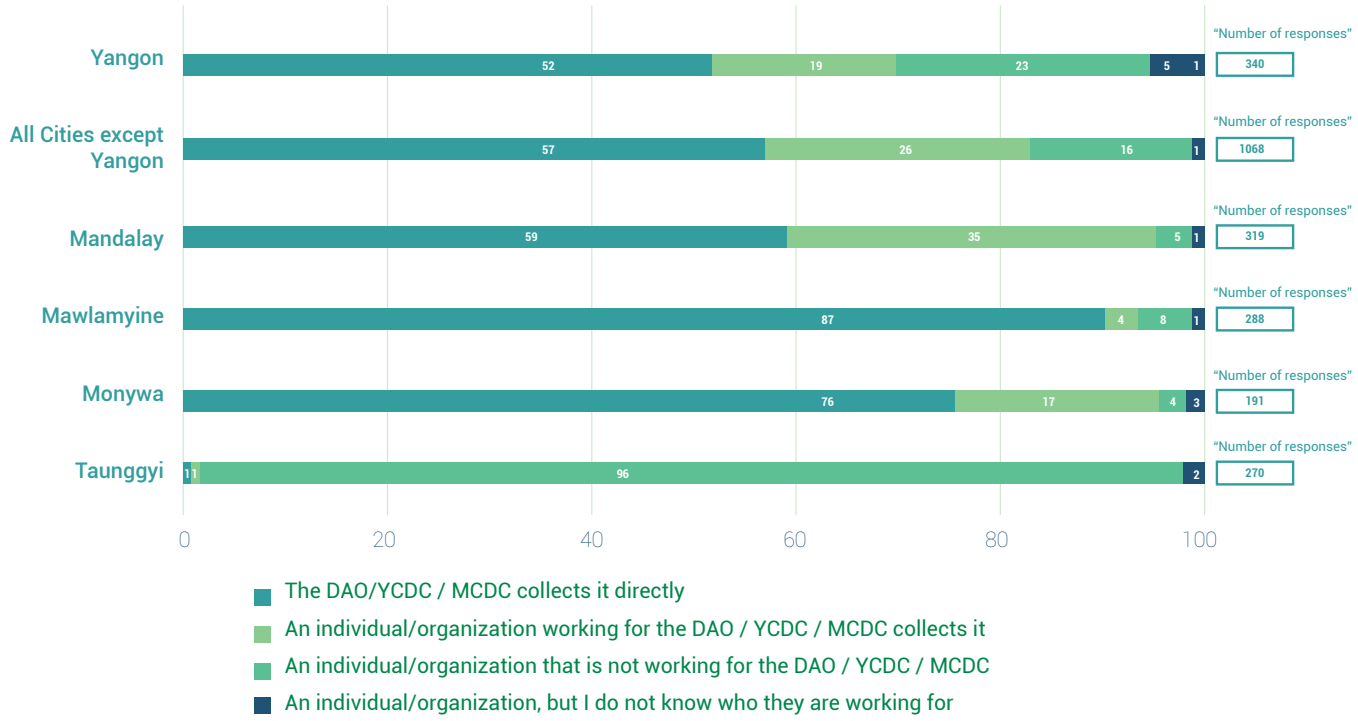
Figure 2: The difference between primary and secondary collection

i. Overview of Current Practices in Myanmar

MSW is centrally managed by municipal authorities across the country. However, in the face of challenges including insufficient funding, all cities in Myanmar operate their MSW systems with some level of localized modification. In Yangon, for example, many apartment dwellers pay individual waste collectors MMK 200 – 300 per bag, and some townships have informal contractors charge households for door-to-door collection, while paying YCDC workers to take the collected trash to landfills. In Shan State, at least seven DAOs have experimented with formally outsourcing garbage collection, with mixed results. A few towns, including Hpa-An and Monywa, have seen local communities step in to fill capacity gaps, while many towns are unable to cope with rapidly rising waste generation and experience widespread open dumping and trash burning.

There is considerable variety in who actually collects people's garbage from their homes or bins. Data from The Asia Foundation's 2018 City Life Survey (CLS) shows that municipal authorities collect the majority of people's garbage, either directly, by themselves, or indirectly through an agent operating on their behalf. A sizeable proportion of garbage is also collected by entities that do not work for the municipality. For example, municipal waste collectors sometimes collaborate with informal waste pickers to help them with collection in return for the right to sell recyclable materials. There is generally a lack of public sensitization over garbage collection arrangements. In Taunggyi for example, the DAO has hired a local contractor to collect garbage across the entire city, but 96 percent of respondents in the survey believed that their garbage was collected by an individual or organization that did not work for the municipal authority (Table 2).

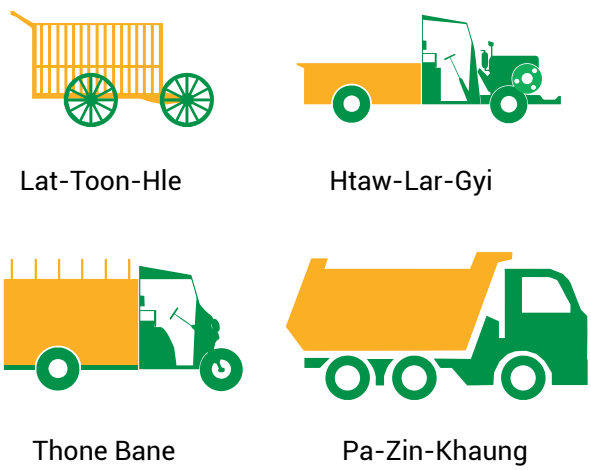
Table 2: Perceptions About Who Collects Household Garbage, 2018 City Life Survey [23]



Similarly, the infrastructure used is extremely varied. Common garbage collection vehicles include htaw-lar-gyi (tractor-pulled carts), thone-bane (three-wheeled trucks), pa-zin-khaung (medium-sized trucks), naut-pwint (large open-bed trucks), and small and large trash compactors. Individual waste pickers in cities like Yangon often use manual push-carts (lat-toon-hle), while larger cities such as Mandalay and Monywa also have fleets of flatbed and cable trucks to pick up garbage containers. The lack of standardized equipment can be advantageous in that each city may purchase whatever equipment is most suitable to its budget and geography; for example, hilly cities like Taunggyi have numerous small, winding roads which are either too narrow or too steep for medium- and large-sized trucks to pass.

There is no formal distinction or development of primary and secondary waste collection networks.[24] This is inefficient, in part because cities often show a preference for medium-sized trucks which engage in both house-to-house collection as well as dumpsite ferrying. This wastes time and resources (such as fuel) because large trucks are better suited for ferrying garbage to landfills (see Textbox 4).

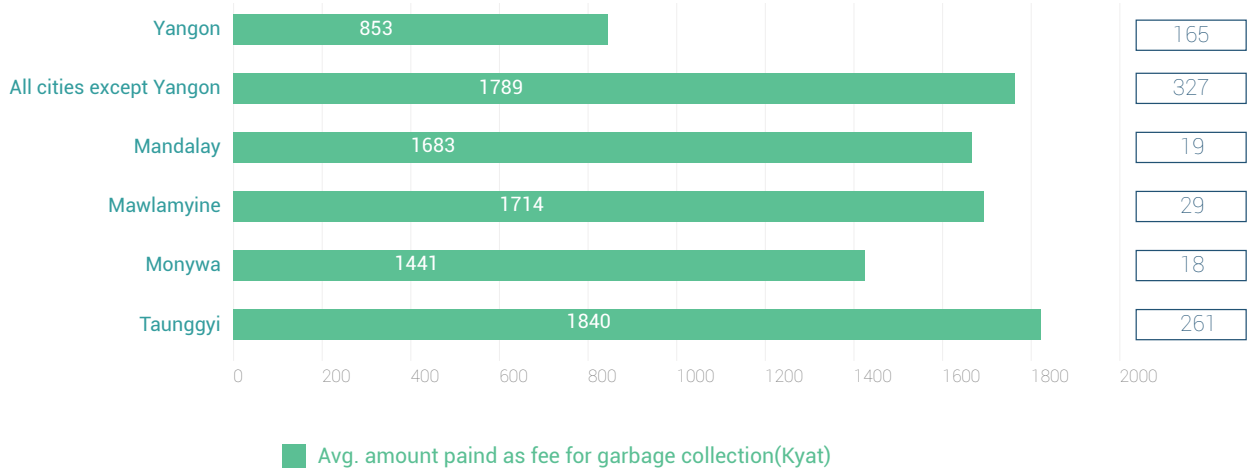
Figure 3: Common Garbage Collection Vehicles in Myanmar.



Historically, funding for municipal "cleansing departments" is one of four line charges in the household property tax. However, the amount of property tax collected by municipalities is extremely low due to low property valuations (McDonald and Hein 2017). This means that DAOs are chronically underfunded, and rely heavily on business license sales and transfers from central and regional governments.[25] Solid waste disposal is surprisingly expensive. Mandalay city, which likely enjoys economies of scale due to its size, has for example estimated that the average cost of collection and transportation of one ton of solid waste to a landfill is MMK 16,855.[26]

The cleansing budgets of all municipalities are, in effect, heavily subsidized from the general DAO budget. In an attempt to cover the cost of expanding MSW collection, many municipalities have introduced a separate garbage collection fee, typically MMK 1,000–2,000 per month for households (see Table 3) and MMK 5,000–10,000 per month for businesses and institutions.[27] However, most DAOs struggle with fee collection which largely relies on the goodwill of the local population (which in turn depends on the quality of service provision), and collected fees are insufficient to cover costs. This gap between revenues and costs means that less funding is available for other municipal services. In turn, the high operating loss is the chief reason why some municipalities have used – or considering using – outsourcing arrangements.

Table 3: Average Garbage Collection Fees Per Month. Based on households that pay a specific fee, not those who either do not pay a fee or where it is part of their property taxes, 2018 City Life Survey.



MSW management in Myanmar is also characterized by extremely low wages, in spite of the hazardous nature of the work. In general, 'followers' (trash collectors, usually two per truck) and some truck drivers are considered day laborers who receive the national minimum wage – MMK 4,800 per day – while many experienced drivers are on salaried contracts. In practice, however, some DAOs pay below the national minimum wage, such as Taunggyi which pays followers as little as MMK 80,000 a month. Even at the national minimum wage, which was increased from the previous level of MMK 3,600 per day in May 2018, laborers struggle to make ends meet. In many cases workers therefore supplement their income through the sale of recyclables, while in some towns there are stories of workers siphoning off gasoline to sell. In some places the community informally provide workers extra compensation in cash or in kind. In Pyin-Oo-Lwin, all DAO workers receive annual bonuses. One clear exception to the norm is in wards 7 and 8 of Hpa-An, where the two followers are each paid MMK 180,000 a month while the driver – who owns the htaw-lar-gyi truck – is paid a total package of MMK 700,000 for labor, maintenance and fuel costs.

This research documented that nine municipalities in Myanmar have to date used outsourcing or are considering it. As far as this report could establish, none of the contracts were awarded through competitive tendering.[28] Private contractors typically take over management of municipal equipment and trucks, and purchase several additional new or used vehicles in an attempt to expand service coverage. However, contractors typically have low levels of financial capital which leads to underinvestment in equipment, including spare parts. They also tend to suffer from human resource gaps and face difficulty in collecting user fees. As demonstrated in the following case studies outsourcing 'solutions' have in many cases introduced little or no benefit to the respective towns. Pyin-Oo-Lwin and Monywa are thus returning to providing waste collection services publicly. In contrast, the Taunggyi DAO felt that although service levels initially fell short of expectations, they have since experienced a general improvement after working closely with the private contractor and The Asia Foundation, and the arrangement will continue.

As mentioned earlier, many DAOs are beginning to charge a separate waste collection fee. Several DAOs that have used outsourcing, such as

Taunggyi and Pyin-Oo-Lwin, have tried handing over fee collection to the contractor. This creates two challenges: one, it is likely to increase the number of users who shirk on payments; and two, it can further undermine transparency by creating information asymmetries (see Textbox 11 and Textbox 13).

Box 5: Government Control of Garbage Fees

Agency theory shows that having governments collect waste management fees on behalf of contractors serves four key functions: controlling user costs, internalizing private information, lowering contractor risk, and increasing compliance. In other words, the municipal government can guarantee that garbage collection will remain affordable for its residents – whether through subsidies or gradual price increments – and have full information about how much revenue is raised. In turn, that knowledge can be used to offer a guaranteed income for the MSW contractor. Compliance is also likely to be higher. Anecdotal evidence from Taunggyi suggests that users are more willing to pay fee collectors that work for the government – perhaps out of a sense of civic duty or fear of the law – than to pay a private operator. These factors all help governments retain financial control, remain involved in the service's production process, and enjoy lowered outsourcing costs.

Another unusual phenomenon in the MSW outsourcing landscape is that towns that have outsourced garbage and garbage fee collection – the chief example being Taunggyi – have also set a fixed monthly fee that the contractor pays out of the fee revenues. In effect, the contractor is paying for the privilege of collecting user fees. This is the inverse of normal practice where contractors are paid a fixed or variable price for executing a given service, and appears to arise from a general under-estimation of the cost of service provision. This 'inverse' practice also implicitly relies on the rather improbable assumption that current waste management models can be made profitable without municipal subsidies, which ends up – in effect – passing the high cost of waste collection on to users: contractors need to either lower the quality of services or raise user fees. In terms of contract theory, this is because contractors take on too high of a risk without a commensurate sharing of rewards.

ii. Myanmar Case Studies

Case study: Taunggyi

Taunggyi – the capital of lower Shan State – was one of the first municipalities in Myanmar to formally outsource waste collection. Taunggyi's DAO signed a contract with a private company, Mhwe Taunggyi Group of Companies (Mhwe), in April 2015, handing over responsibility for solid waste and sewage collection in the city's 22 urban wards (with an option of expanding service provision to Taunggyi's two nearby subtowns, Aye Tharyar and Shwe Nyaung) as well as cleaning and bin emptying alongside a three-mile stretch of the central road, Bogyoke Aung San street. In return for being allowed to collect garbage fees, the company pays MMK 3 million (a little under US$ 2,000 at the time of writing) to the DAO each month. Although the contracting experiment has run into several problems, it has enabled the city to expand coverage in terms of both geographic reach and volume of trash collection. It is noteworthy that according to The Asia Foundation's 2017 City Life Survey, 56 percent of residents in Taunggyi felt that municipal solid waste collection was satisfactory (either agreed or strongly agreed) while roughly 30 percent were dissatisfied (either disagreed or strongly disagreed).

One clear advantage is the improved garbage collection service, both in terms of breadth

(coverage) and depth (frequency/quality). Before outsourcing, Taunggyi's municipal government was able to collect solid waste from roughly 50 percent of the city.[29] This system relied primarily on waste collected from 12-feet long open rectangular waste collection boxes and a dozen large containers spread throughout the city. The private company continued using these collection points but expanded service collection across more wards, increasing coverage to about 70-75 percent of the city, [30] with no increase in user fees. The company also began doing door-to-door collection – stopping at every fifth household – in some wards. At the beginning of the contract, the company purchased large flatbed trucks to easily transport trash containers for emptying at the landfill. Together with a reduction in the use of small three-wheelers (thone-bane) in narrow lanes to rely more on small trucks (pa-zin-khaung), the contractor's evolving use of equipment demonstrated a capacity for innovation. Another positive aspect of the Taunggyi outsourcing contract was that it stipulated appropriate risk sharing between the DAO and the contractor in case of unavoidable delays by, for example, natural disasters, and included detailed provisions for breach of contract and dispute resolution.

The contract's garbage fee mechanism (together with language used by DAO officials in personal conversations) indicates that the Taunggyi DAO initially viewed garbage collection as a potential source of revenue. This may over-estimate the benefits of outsourcing and hide the true social cost of providing adequate garbage collection. Furthermore, having the contractor collect fees skews the contractor's incentive structure towards profit maximization, at the possible expense of lowered quality of service or raised fees. It also opened the door to community perceptions of the contractor earning unfair profits or not providing a sufficient standard of service. According to DAO officials, this made it difficult for the company to collect fees and contributed to the company experiencing a consistent operational loss, which it only intermittently recouped from income from sewage collection. Interviews with members of the municipal authority and the company suggest that low profits meant the company has been unable to invest in more equipment to cover the entire city or cover vehicles taken in for maintenance, and that the DAO therefore had to step in to cover cleaning and trash collection along Bogyoke Aung San street, the city's main road. The company also decided to relinquish the optional clause to extend to two sub-wards.[31]

Other weaknesses in the contract include its long duration at 30 years (with options for 15-year extensions in perpetuity). The contract specified a large upfront capital investment by the private contractor of MMK 734 million which could potentially justify its long contract duration for recuperating those costs, but the actual amount invested is not known. The contract also lacked a clearly defined monitoring and evaluation mechanism, with a relatively vague specification that DAO "staffs or its representative delegated persons must manage and supervise" investments and service provision.[32] In addition, the lack of control over user fee collection means that the DAO lacks data needed for negotiating a better contract in future.

Box 6: Lack of Sanitary Landfills in Myanmar

As far as this research project could establish, there is currently only one managed or sanitary landfill in Myanmar. Sanitary landfills are sites where waste is isolated from the environment until it is safe. They include four basic elements: formal engineering preparations taking into account local geological and hydrogeological features (and plans for final restoration after end of lifespan); trained staff to supervise site preparation, operations and maintenance; disposal of waste in layers that are covered with soil each day; and hydrogeological isolation – using either natural land features or lining material – to isolate toxic leachate. Further to the last part, it is vital that leachate is collected and properly treated to avoid contamination of surrounding soil and/or groundwater.[33] In the long term, all of Myanmar's dump sites will need to be converted to sanitary landfills. However, in the short term, simply switching landfill management from uncontrolled dumping to some form of controlled (semi-managed) use will increase the lifespan of dump sites and reduce leachate flow,[34] and "remediation, upgrading and expansion of current dumpsites is way cheaper than developing new ones." [35]

Case study: Pyin-Oo-Lwin

Pyin-Oo-Lwin is a hill town of about 91,000 inhabitants (14,573 households) in Mandalay region and a popular tourist destination, well-known for its botanical garden. The town experimented with outsourcing waste collection from February 2016 to March 2017, although the DAO took over responsibility for waste collection again on April 1, 2017. The DAO claims that it has since achieved virtually full coverage amongst its 10 urban wards and sporadic coverage in four of eleven outlying peri-urban wards ('villages'). It is interesting to note that Pyin-Oo-Lwin has the only managed, semi-aerobic landfill site in the country, and its officials are planning to promote a "reduce, re-use, recycle" model for long-term waste management.

Pyin-Oo-Lwin's previous administration set up the outsourcing contract, ostensibly because the municipality was unable to cover the entire city. In addition to taking over operation of the DAO's six trucks, the contractor purchased ten additional trucks and was also given three new ones (including two water waste tanks) by the DAO. The current DAO estimates that their previous coverage for waste collection was about 65-70 percent and that the private contractor's effective coverage was more or less the same.[36] The administration furthermore felt that the contractor was acting in bad faith by for example cherry-picking which households to cover, ignoring peri-urban and hilly areas which were harder to reach, and by not helping the municipality with emergency clean-ups in a timely manner. Public complaints from people who were not covered or received insufficient service – in spite of an increase in garbage collection fees – eventually led to the regional government directing the DAO to cancel the contract in early 2017.

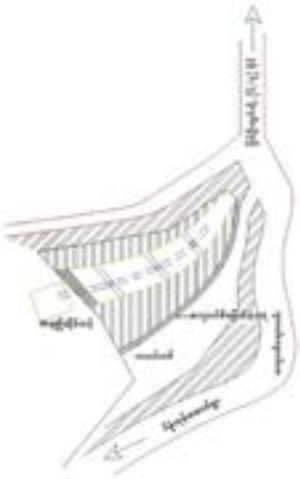
The Pyin-Oo-Lwin outsourcing experiment saw marginal success in that the contractor was able to expand frequency of coverage after purchasing ten new vehicles. Pyin-Oo-Lwin also became the only DAO in the seven districts of Mandalay Region whose cleansing department was earning a small net surplus because of the fees the contractor paid. This was enabled in large part due to increased waste collection fees (the previously fixed fee of MMK 1,000 per month for households was replaced with a range of MMK 1,000-3,000 per month while businesses paid between MMK 6,000 and 40,000). In this case, outsourcing became an incomplete solution which primarily shifted the cost burden from the DAO to residents without creating a proportion-

al increase in service quality. In light of this, the municipal authority felt that the DAO itself was better suited to carrying out waste collection, though with support from the state/regional government to invest in equipment (trucks) and manpower.

Box 7: Policy Lessons from International Case Studie Pyin-Oo-Lwin's Managed Landfill

As far as the authors are aware, Pyin-Oo-Lwin has the only example of a managed landfill site in Myanmar. Based on designs by U Soe Aung, the Executive Engineer of Mandalay Regional Development Committee who was trained in landfill management in Japan, Pyin-Oo-Lwin DAO constructed a low-cost system that takes advantage of the landscape's natural slope (the landfill is located in a narrow gorge between two small hills) together with an in-house constructed concrete tube to collect leachate from the waste. It also has half a dozen vertical PVC tubes to collect methane gas to avoid dumpsite fires and potentially monetize the waste at a later date. Next to the landfill is a simple shed which functions as a sorting station for recyclables. The DAO earns about MMK 2 million a month from a local contractor who sorts the waste, and this money is used to cover monthly bonuses to cleansing department staff (numbering 80 in total, out of which 60 were said to be day laborers who earn the minimum MMK 4,800 daily wage). This is in addition to the annual bonuses which are awarded to all DAO staff members, which appear to have greatly improved staff morale: Administrators interviewed reported high staff diligence and that they gladly worked extra hours in cases of emergency clean-ups.

CROSS SECTION



LAYOUT PLAN

LONGITUDINAL SECTION

Case Study: Hpa-An

Hpa-An is a medium- to-small-size city with a population of a little under 100,000 and is the capital of Kayin State in south-eastern Myanmar. The city has experimented with outsourcing at the local level, namely in wards 7 and 8 in the south-western part of the town. In July 2018, the municipal authority employed just six small garbage trucks (four pa-zin-khaungs and two compactors) but stretched them to provide service coverage to roughly 75 percent of the city. The DAO was also expecting to receive several new trucks through a state-wide procurement process. According to the 2017 CLS pilot survey, 17 percent of respondents in Hpa-An strongly agreed that they received satisfactory waste collection by the municipality, while about 20 percent strongly disagreed, which could suggest that a part of the DAO strategy has been to use its trucks for frequent coverage of some wards while leaving other areas largely or completely uncovered.[37] In addition to potentially moving towards a single-line property tax bill, which it hopes will make residents more willing to pay garbage collection fees, the DAO hopes to raise further revenue with the expected new trucks through so-called special collections (from e.g. businesses and construction sites).

The outsourcing experiment in Wards 7 and 8 is illuminating. The system is currently managed by the Ward Administrator[38] of Ward 7, who was elected in 2016; it is not known when exactly it was first introduced, but the Ward Administrator claims that it was implemented by his predecessor. Localized outsourcing is both surprisingly simple and effective: one truck driver is employed who drives his own medium-sized truck (htaw lar gi) to collect garbage in both Wards. Two "followers" are hired to pick up the waste. The 100-household leaders of the wards collect the garbage collection fees (MMK 1,000, the same as the fee charged by the DAO, while the Ward 7 administrator spends about a day per month managing the finances of the scheme. The local community are not directly involved in the process. The driver's compensation, fuel and maintenance cost an average MMK 700,000 (roughly US$500) per month while the two followers are paid MMK 180,000 each. The truck's schedule is consistent enough that residents are accustomed to placing their garbage in closed bags outside their houses in advance of its arrival, and each household is – on average – canvassed every second day.

A striking feature of the system is that the fee structure and service level are very similar to that of the DAO, but the wards are able to collect enough fees to break even. By contrast, Hpa-An's DAO heavily subsidizes waste collection. The wards' performance was made possible by having better fee collection; ward 7, for example, has around 600 registered households which all pay the full amount, while most unregistered households pay smaller contributions. The system has, in effect, leveraged local knowledge and social capital of community leaders (i.e. 100-household leaders) to overcome the collective action problem of fee collection. This has enabled the wards to receive equal or improved service to that in the rest of the city, and without a public subsidy. The truck driver is an individual contractor who has not signed a formal agreement with the ward administration and the relationship is built on personal trust. His compensation is high enough so that the service level is kept high. The followers also receive a much higher monthly wage than is typical for those working for daily wages – their salary is roughly twice the amount followers are paid in Taunggyi, for example.

The single biggest challenge to this approach is capacity at the ward level. The ward admin-

istrator role is a semi-voluntary position with no formal training required and only a nominal compensation. Many administrators may not be able or willing to take on the level of additional work undertaken in wards 7 and 8. The system also raises the workload of 100-household leaders, whose position is unpaid. In addition, there is no independent oversight – by either the community or DAO – of the system or its finances. Lastly, residents in wards 7 and 8 effectively pay a slightly higher fee than other residents in Hpa-An because the garbage collection fee is in addition to the cleansing department component of their property tax (which is collected by the ward administration and handed over to the DAO every six months). In the rest of the city, the garbage collection fee replaced the cleansing line entry on tax bills.

v. Case Study: Monywa

Monywa is a medium-sized town in Sagaing Region. The city has 38,488 registered households in 31 wards with a toal of at least 190,000 residents.[39] The DAO employs a total of 102 full-time staff. Out of these, the cleansing department has three administrators and a waste collection team consisting of eight drivers and 145 day laborers. Uniquely, Monywa's MSW system has moved from full DAO management to full outsourcing, and then back to partial municipal management with four wards switching to a community-managed model. Monywa has a relatively complex MSW management system which covers six administrative zones and operates in three shifts daily (day, evening and night). The DAO currently covers 30 wards, or approximately 290 to 300 of the city's 600 streets. It collects about 130 tons of solid waste each day, of which 30 tons come from businesses, one ton from hazardous sources such as hospitals, and the rest from household waste.

Monywa attempted outsourcing in 2013 but cancelled the contract after just two months. The DAO initially signed a one-year contract with a small local company which took over operation of the DAO's trucks. However, the fees paid by the DAO were allegedly insufficient to cover operational costs such as labor and fuel, so the company quickly folded and the city experienced mounting illegal dumping.[40] After resuming MSW responsibility, the DAO sought to increase its capacity with support from the regional government as it only had thirteen vehicles, several of which were damaged. It then began receiving up to two new vehicles each fiscal year. Collaboration with a local MP resulted in an increase in assistance from the regional government, and by 2018 the DAO had 42 vehicles (including thone-banes, hook trucks and flatbed trucks for collecting waste containers, and miscellaneous vehicles such as a bulldozer and a digger). The vehicles are separated into three streams which – respectively – collect waste from households, markets and commercial properties, and disposal from sixty garbage containers in downtown areas.

Four wards in the city have implemented their own waste management system since 2013, characterized by a high level of stakeholder involvement from community members and collaboration with the DAO. This model is therefore an example of collective management by the local community where ward administrators played more of a facilitating role. Three of the wards[41] collected money to purchase their own three-wheeled tractor-trucks (htaw-lar-gyi), while the fourth ward (Aung Mingalar) rented one. In 2018, the three wards that bought the trucks were still running their own schemes, with subsidies from the DAO, while the waste collection in Aung Mingalar[42] is now covered by the DAO.

DAO Executive Officer, U Tun Tun, told researchers that participation and assistance by the local community has been key to the city's success in waste management and other municipal reforms. Residents, for example, frequently volunteer their labor for local infrastructure development such as building new roads and drains. In the previous fiscal year, this enabled the DAO to pave over twenty miles of road instead of the seven miles for which they had been allocated funding. At the ward level, residents are further involved through town hall meetings for outreach campaigns and/or discussing municipal reform projects, while various local ward-level officials are directly involved with supervising waste collection and identifying development priorities at the planning stage. This has helped build trust with the local community, enabling more goodwill and both cash- and in-kind contributions to DAO development projects.

Monywa's reform approach has enabled the city to implement numerous projects on very tight budgets. This is vital since key services such as garbage collection have no separate fee component for private households. Garbage collection is running at a consistent loss: in the 2017 – 2018 fiscal year, the cleansing department had MMK 426.44 million in expenditure and only MMK 72.92 million in revenues, out of which 55.90 million came from property taxes and the rest from business collection fees.[43] The DAO frequently experiments with new approaches, such as the installation of 60 trash containers in locations with frequent dumping (which may in future form the backbone of a primary and secondary collection system), training staff in GIS mapping techniques, and creating plans to install CCTV cameras with a view towards curbing dumping.

This approach, however, requires a lot of outreach and time and effort to build trust between administrators, local leaders and local communities. Some cities may not have sufficient resources or trust (social capital) among the local population to pursue a similar approach.[44] Moreover, Monywa's cleansing department is able to earn less than 20 percent of its monthly cleansing expenses because it does not have a garbage collection fee for households. This is fiscally unsustainable.

iii. International Case Studies

This section contains two brief international case studies related to municipal waste collection and outsourcing. The two case studies have been selected in part because they demonstrate strong contrasts about how bad outsourcing waste collection can go wrong (India) and – conversely – how successful a city can be if it involves the local community together with other stakeholders (Indonesia). They were also chosen because they are from the nearby region with more comparable levels of public and private-sector capacity to Myanmar than more developed economies, albeit they have been working on reforming waste management for longer.

Case Study : Pondicherry and Bangalore, India

Pondicherry is a city with a population of about 1.4 million on the south-east coast of India which in 2010 produced over 400 tons of solid waste per day. That year, the municipal government awarded an ambitious 19-year solid waste management contract on a 'build, own, operate, transfer' (BOOT) basis to Kivar Environ Private Limited, which formed a public-private joint venture named Puducherry Municipal Services Private Limited (PMSPL). In addition to street and gutter cleaning and door-to-door collection of household waste, the contract included promises for the design, construction and operation of a modern sanitary landfill; development of a state-of-the-art laboratory for chemical testing,

and environmental impact monitoring pre- and post- landfill closure.[45]

However, the PMSPL – whose private contractor had no previous experience in solid waste management – was widely reported as having drastically lowered the quality of service provision by engaging in uncontrolled dumping of unsegregated waste at the new landfill site. This was in part due to the way the contract was designed, which compensated the contractor per ton of waste collected and disposed of. This incentivized the company to reverse existing gains in waste segregation at the household level in some wards (initiated by civil society organizations). Moreover, PMSPL was widely accused of illegally dumping hazardous waste instead of safely disposing of it, in contravention of its contract as well as national environmental laws, which resulted in widespread protests. The contract was moreover awarded at nearly 80 percent above the US$ 7.2 million budget that the regional government had originally sanctioned.[46,47]

This echoes lessons from Bangalore city in nearby Karnataka State, which selected a private contractor to professionally manage a new 100-acre landfill in Mavallipura in 2004. The company (Ramky Infrastructure Ltd), however, was accused of engaging in open dumping of unsegregated waste which resulted in widespread poisoning of local water sources from untreated leachate, and eventually led to the temporary closure of the landfill from 2012 to 2015 amid public protest and legal action.[48,49]

Case Study : Surabaya, Indonesia

Surabaya is a city with a population of 2.85 million on the eastern end of the island of Java in Indonesia. At its peak in 2001, Surabaya generated 2,000 tons of waste per day. By 2016 it had cut that figure by 25 percent due to the successful adoption of a community-based waste management model that focused on recycling and composting.[50]

Surabaya municipality, in collaboration with local non-government organizations (NGOs) and the City of Kitakyushu (Japan), began a household-level waste segregation program in 2004 and an annual "Clean and Green" neighborhood competition in 2005. Hundreds of neighborhoods began independent waste management schemes, taking care of primary collection in their areas. The model was first initiated in one community, but with strong support from multiple stakeholders it was successfully scaled up to encompass 30 percent of Surabaya's roughly 9,000 neighborhood associations. Knowledge, tools, and technical assistance was provided by the City of Kitakyushu,, while NGOs spearheaded community awareness and the distribution of compost collection baskets. This allowed the municipal government to focus more on secondary collection infrastructure, particularly the construction and management of 12 composting centers. The private sector, including Unilever and various local media outlets, also assisted by sponsoring and promoting the "Green and Clean" competition.[51,52]

Between 2008 and 2010, of the municipal government's annual US$ 10 million waste management expenditure, only 2 percent was allocated to promoting waste segregation and composting[53] yet the pay-offs have been significant. In addition to the 25 percent waste reduction, which also saves costs on waste transportation and processing, the city has increased its amount of green space (by five acres between 2006 and 2007 alone) and sparked the creation of 15 recycling start-ups.[54] Surabaya has received multiple international awards for its efforts from the UN and environmental organizations in the United Kingdom and Austria,

and has inspired similar initiatives in other cities across Indonesia and neighboring countries in Southeast Asia.

Box 8: Policy Lessons from International Case Studies

***1.** **Outsourcing should include strict quality conditions that a contractor must meet.** These should not be based on weight since this encourages bad behavior (the contractor might over-report the waste collected, or stop segregating waste, or weigh down garbage with other items like rocks). Quality controls can instead be based on, for example, collection frequency and area of coverage, or on the reduction of open dumping. In turn, these quality conditions must be enforced through continuous monitoring and evaluation.*

***2.** **It is important to work with other stakeholders such as local communities, civil society, and the private sector to improve waste management practices.** Moreover, decentralizing the waste management process to the community level has the potential to significantly improve garbage collection and segregation. This may be because it is easier to implement reforms at small scale and/or because it gives local community members a sense of ownership over the process.*

***3.** **Waste segregation and composting of organic kitchen waste can significantly reduce the amount of waste going to landfills.** Although this requires significant community mobilization, it is a relatively cheap reform with high potential for reducing the cost of municipal waste collection.*

3. Waste Collection Outsourcing Options Available to DAOs

Solid waste management involves many stakeholders pursuing their own interests and so has the properties of a 'complex system'. MSW management in Myanmar demonstrates a high level of heterogeneity. Both factors make it difficult to provide a clear recommendation of the best approach for each municipality. In response to this, we first offer a classification system that categorizes the different MSW management approaches adopted in Myanmar, summarized in Figure 5. Although it is a simplification, the classification is reflective of the information and case studies already discussed. Different policy options (A, B, C, D, and E) are elaborated, together with their advantages and disadvantages.

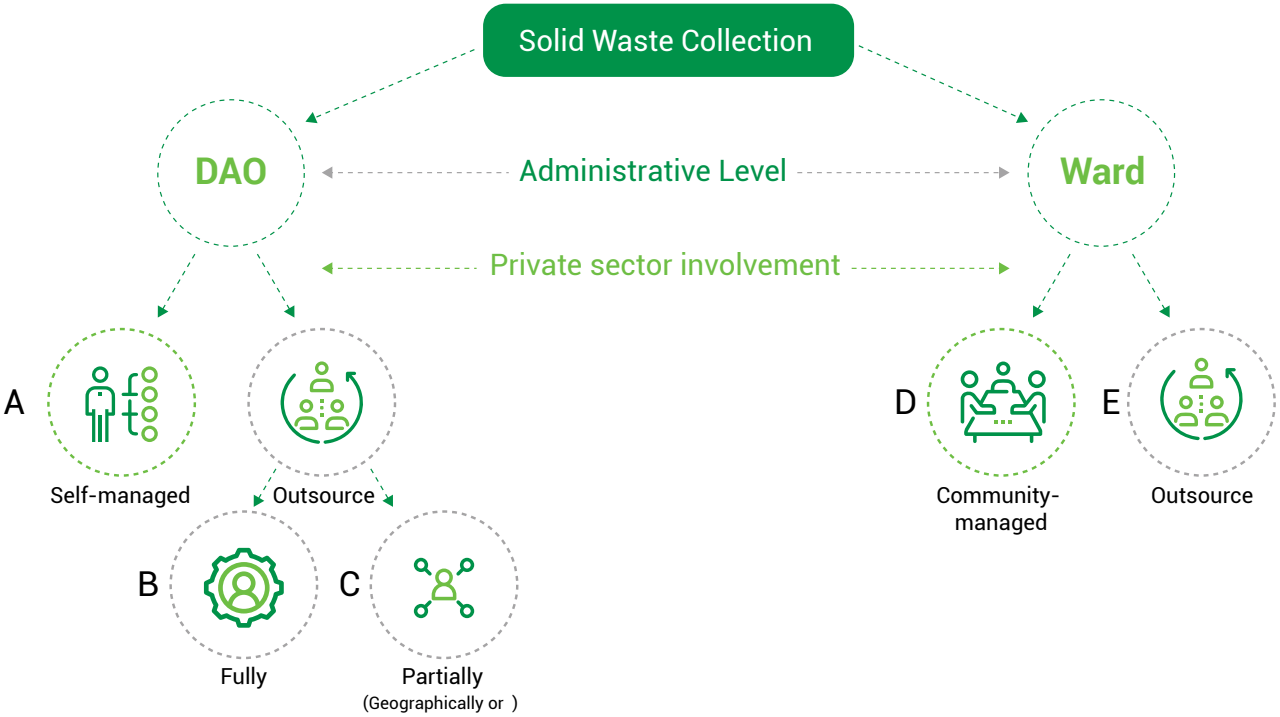
We use this classification as a basis for developing a decision-making tree, as shown in Figure 6. The decision-making tree provides local policymakers with a tool to help decide the most appropriate model for waste management reform in their municipality. Similar to the MSW management classification diagram, this is not meant to be exhaustive but to provide some guidance and to enable more informed discussions. The main consideration in the decision-making tree is the organizational capacity of each respective stakeholder, i.e. DAOs, private contractors, ward administrators, and the local community. For example, does the municipality have the administrative capacity to properly design, tender and manage an outsourcing contract? Are there private sector firms with experience and sufficient financial and human resources? Or are the local communities capable of purchasing their own equipment and managing waste collection themselves?

Box 9: Heterogeneity

Heterogeneity *refers to differences across units being studied. In economics, individual consumers, firms, and sometimes even countries are often treated as essentially the same (homogeneous). This may be statistically and theoretically valid for generalizing across large populations. However, in the context of institutional economics and economic policy, when policies are emulated or adapted across different national and sub-national contexts, their unique (heterogeneous) characteristics are important as they can lead – in turn – to highly heterogeneous outcomes.*

As highlighted in Figure 5, understanding MSW management begins with two key strategic questions that each DAO may ask and answer for itself. First, at what administrative level should the responsibility for collection fall: the DAO or the individual ward? Second, what involvement should there be from the private sector involvement, if any? Outsourcing is fully conducted where a contractor takes over complete responsibility of waste collection (B) or partial if either the geographic scope or specific administrative tasks are shared with the municipality (C). Outsourcing can also occur at the local ward level by contracting individual drivers and laborers (E).

Figure 5 : Categorization of MSW Management Approaches Adopted in Myanmar.



A. DAO -> Self-manage

What: DAO takes direct responsibility for waste collection. Will likely require more invest ment in physical and human resources by the DAO – which will need to be raised internally or externally – to fully cover the municipality.

Example: Mawlamyine

Advantages:

- Makes use of existing institutional infrastructure.
- Government employees may work hard even at low pay due to a sense of civic duty.

Disadvantages:

- Most DAOs lack the financial and human resources to provide full coverage.

- Requires raising significantly more capital from, for example, taxation or transfers from the state/region government.
- Innovation is likely to be slower.

B. DAO -> Outsourced -> Fully

What: DAO hands over full responsibility for all solid waste collection to a private contractor or contractors, while monitoring contract implementation.

Examples: Taunggyi; Pwin-Oo-Lwin (was fully outsourced and then returned to the DAO)

Advantages:

- Private sector actors may increase service quality/coverage if they can leverage suf ficient investment.
- May lead to quicker innovation, assuming the bidding process is competitive and the incentives are properly aligned.
- Allows the DAO to circumvent local government hiring norms which hinder service expansion by limiting recurrent budget (which includes staff costs).

Disadvantages:

- User costs are equal to, or maybe even higher than, government service provision.
- Requires significant administrative resources for DAOs to manage properly, as out sourcing requires thorough tendering and contract design, and continuous monitor ing and evaluation.
- Contractor has an incentive to cut costs by, for example, ignoring harder to reach places, decreasing pick-up frequency, lowering worker conditions, or reneging on replacing damaged equipment.
- Myanmar's private sector is still nascent and capital constrained. This means that the private sector may lack the financial resources or human resource capacity to handle a contract, especially in smaller towns. Moreover, if only a single firm is able to bid on the contract, then outsourcing does not create competition.

C. DAO -> Outsourced -> Partially

What: DAO shares responsibility with a contractor, splitting the workload based on either tasks (e.g. one party manages the fleet of vehicles while the other one manages hiring of workers) or geographic area (i.e. the municipality covers some townships and the contrac- tor others).

Example: None

Advantages:

- Private sector can supplement lack of capacity in DAOs.
- Takes advantage of existing institutional infrastructure.
- Allows the DAO to circumvent local government hiring norms which hinder service expansion by limiting recurrent budget (which includes staff costs).
- May lead to quicker innovation.

Disadvantages:

- Includes significant administrative costs for DAO to manage.
- Contractor has an incentive to cut costs.

D. Ward -> Community-managed

What: The community members of a specific ward manage waste collection on their own, sharing the costs of buying whatever equipment is suitable to their neighborhood layout and budget, and hire (and supervise) workers. Can be overseen by ward officials and/or a neighborhood committee; the key distinguisher is that it is a bottom-up approach, with funding and administrative involvement by the community.

Example: Monywa (in four wards)

Advantages:

- Reduces the administrative burden for DAOs.
- More responsive to local context, which can potentially lower user fees (i.e. by buying cheaper or more efficient waste collection equipment).
- Allows the DAO to focus on secondary collection, which can create more systemic efficiencies.
- May improve fee collection.
- Improves accountability, which may improve service provision.

Disadvantages:

- Requires significant mobilization effort and a sense of civic responsibility in the com munity.
- Requires a willing ward administrator and/or 100-household leaders who will likely have extra work.

E. Ward -> Localized Outsourcing

What: Ward administration directly implements some form of local outsourcing, by for ex ample contracting a single truck driver and/or a group of laborers. Ward manager also su pervises fee collection and expenditures, as well as performance monitoring. Although it is a localized solution, this approach is less grass-roots oriented than option D because the local community is not directly engaged in waste collection management.

Example: Hpa-An (wards 7 and 8)

Advantages:

- Reduces the administrative burden for the DAOs.
- More responsive to local context.
- Allows the DAO to focus on secondary collection.
- May improve fee collection, especially if undertaken by 100-household leaders. In turn, this may lower user fees from reduced free-riding (see Textbox 11).

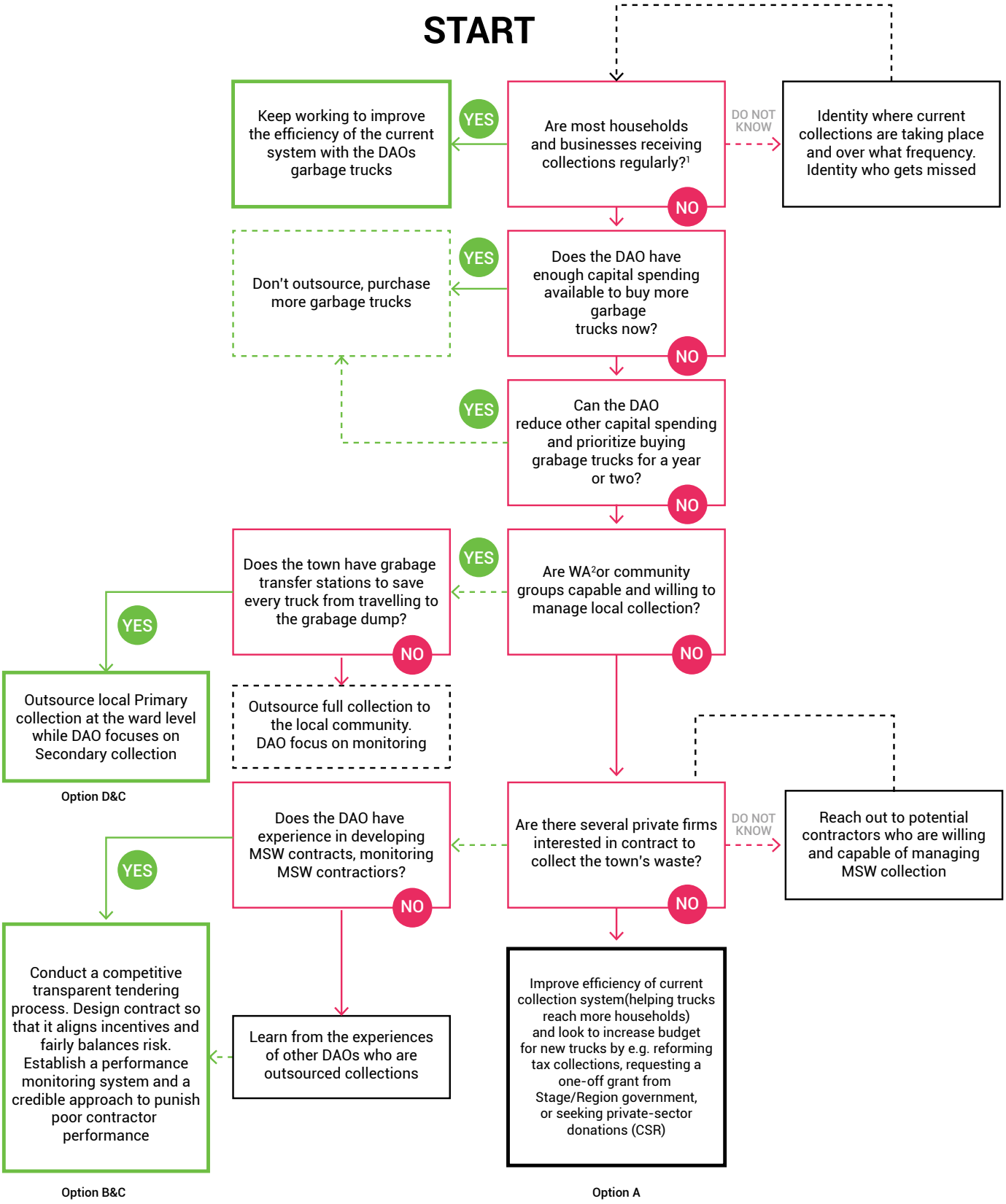
Disadvantages:

- Requires a willing ward administrator and 100-household leaders who will have extra work.
- May result in higher user fees because wards effectively lose DAO subsidies.

Several policy lessons emerged from the classification system which was used to develop the decision-making tree shown in Figure 6. Although tools like this should not be taken as an absolute guide, if carefully considered in light of local conditions, these lessons can help local policymakers decide how to improve waste collection in their municipality. As already indicated, outsourcing to a private contractor is only one of several possible reforms; if the existing system is capable of covering most households on a regular basis, then it is likely that the DAO does not need to undertake significant reform but instead can focus on improving the efficiency of the current system, but, for example, mapping out better garbage collection routes or inspiring workers to work more. However, if the DAO is struggling to cover all parts of the city with basic collection services and needs to undertake significant changes, there are three general approaches to reform (as seen in the main decision outcomes in the figure. First, the DAO can apply a community-grass-roots approach by outsourcing to the local community or have the local community conduct primary collection while the municipal authority takes care of secondary collection (options D and E). The DAO can also outsource to a capable private sector firm by designing a balanced, performance-based contract that is tendered in a competitive and transparent manner (options B and C). Lastly, even if the DAO does not currently have the capital budget to buy more trucks, it can keep waste collection public and search for additional funding through tax reform, p rivate-sector donations, or direct budget support from the state/regional government (option A).

Figure 6: Municiple Outsourcing Reform Decision Tree

Municiple Outsourcing Reform Decision Tree



Note
1 - e.g > 90% have their waste collected from near their property once per week
2 - Ward Adminstrators

4. Conclusion and Policy Lessons

Under certain conditions outsourcing can be effective, but if these conditions are not met, outsourcing can be counter-productive. Municipalities considering outsourcing or other reforms should begin by asking themselves broad questions about local constraints, what they hope to achieve from outsourcing, and what their long-term strategic goals are. For example, if a given DAO wants to develop stronger
community relations while reducing its own administrative burden, it may consider the role and relative capacity of warden administration offices and how they can help improve waste collection. Together with the analytical tools provided above, the policy lessons in this chapter provide a starting point for discussing outsourcing and effective MSW management reform.

The first section provides a summary of practical lessons from economic theory and empirical analysis. These findings are based on a thorough review of relevant literature, which has been included as a full chapter in Annex 1. Although this is based on economic research abroad, care has been taken to structure the findings in the political economic context of Myanmar. Context is critical and there are no hard and fast rules for when municipalities should outsource; nevertheless, the literature provides important lessons for how municipalities can best approach, design, implement and monitor outsourcing contracts.

Decentralization has enabled experimentation with outsourcing and other waste management techniques. This has resulted in a growing diversity of practice that offers valuable lessons. These innovations in practice could help improve solid waste management across Myanmar's cities if the lessons from these experiences are captured, shared and learned from. The second section therefore lists policy lessons from these experiments and summarizes how municipal authorities in Myanmar have approached outsourcing contracts. The third section provides broader lessons on how to improve municipal waste collection and management in Myanmar drawn from the research conducted for this report.

i. The Economics of Outsourcing

1. View outsourcing as a solution to weak public sector capacity, not as a cost-saving mechanism. When properly conducted with thorough tendering, contract design and continuous monitoring and evaluation, outsourcing MSW collection is unlikely to lower the administrative burden or cost for the municipal authority. Similarly, proper waste collection coverage is expensive and private contractors are usually unable to undertake it at a lower cost than the municipal government. Outsourcing may nevertheless still be effective if it improves the quality or scope of service delivery. It should therefore primarily be viewed as a stop-gap solution to weak public sector capacity (i.e. small budgets and small garbage truck fleets) when municipalities do not have the means to improve service provision.

2. Yet firms in Myanmar are also likely to face considerable challenges in operating large-scale collections. Setting up city-wide waste collection infrastructure requires the ability to leverage sufficient capital investment to purchase necessary equipment and hire capable human resources. This is unlikely to be the case amongst small- to medium-sized firms, as are present in smaller towns in Myanmar, due to difficulties in accessing credit. However, unlike advanced economies where waste collection forms a natural monopoly,[55] Myanmar has cheap labor

and experience using small collection vehicles, which means that municipalities may achieve efficiency by contracting waste collection at a smaller scale, such as the ward level.

3. Carefully design contracts to align the incentives of the contractor and the municipality. This is done by sharing risks and rewards in such a way that both groups find the arrangement works for them. For risks, for example, this means taking into account how to deal with unforeseen circumstances and the likely future changes in the size and complexity of cities. For rewards, it means that both parties benefit from improved service provision by making sure the contractor is rewarded fairly. A common way of achieving this is to build performance-based contracts combined with a continuous monitoring system. When incentives are misaligned, contractors will reduce the reach or frequency of their collections because it is not profitable for them. The quality of the monitoring mechanism is often a key determinant of how successfully a contract is governed.

4. Municipal authorities should re-evaluate existing practice of outsourcing the collection of fees to private contractors. DAOs relinquish financial control when they do not collect fees on behalf of private contractors and undermine incentives for performance. DAOs give up their ability to impose the fines written into their contracts for poor performance – and DAOs are unlikely to take contractors to court due to deficiencies in the legal system. Outsourcing fee collection removes the immediate frustration faced by DAO staff who often struggle to collect fees. However, this may result in lower overall collections and so lower coverage. An argument can also be made that DAO collection of fees helps reinforce the social contract between residents and the city. It also gives the municipality complete information about revenues, which makes it easier to negotiate, monitor, and evaluate contracts.

5. Make the tendering processes public, competitive and transparent. Competitive tendering creates competition between potential contractors, thus lowering costs and/or improving the quality of bids. Transparency creates better contract scrutiny, which may improve contract design.

6. Limit contract duration to the time required to recoup the contractor's capital investment costs. It is in the interest of the municipal government to keep contracts short so that the market remains competitive and allow new contractors – which may be able to operate more efficiently – to make bids. Conversely, however, a contract that is too short – such as a year or two – does not offer the contractor an opportunity to recuperate capital costs. The municipality should therefore limit the contract to the cost recuperation period (based on projected earnings) because it is the minimum duration contractors may be willing to commit to. Another alternative is to include a break clause within contracts so that at a predetermined point in time both parties to the contract can decide whether or not they want to continue with the contract. This can also provide a point for them to re-negotiate elements of the contract in light of the changes that will have occurred since the initial contract was signed.

7. Develop strong relations with different stakeholders to create better contract enforcement and improve overall waste management. Building a good relationship with the contractor based on mutual trust will encourage the contractor to perform better, while continuous community engagement will make people more likely to engage in good waste management practices.

Collaboration with local communities can also improve contract monitoring.

ii. Outsourcing Practice in Myanmar

1. Myanmar's municipalities have begun outsourcing municipal solid waste management but not for the usual reasons given in wealthier countries. DAOs rarely cite pure cost cutting, or a reduction in user fees as the main reason for outsourcing. This is because their priorities are to expand collection services to cover more households and businesses, in terms of both frequency and reliability, and to reduce their budget deficit by moving waste collection off their books.

2. The primary rationales given for outsourcing are to overcome weak public sector capacity (particularly equipment and financial constraints) and to reduce financial losses. For most DAOs the principle constraint is the size of their garbage truck fleets and the lack of funding to cover maintenance and staff. Many DAOs operate MSW at a large financial loss because waste management revenues – whether from property taxes or waste collection fees – are too low to cover the cost of collection. Outsourcing is seen as a way to reduce this and free up resources for other budget priorities. This is in line with what the economic literature suggests for developing countries.

3. However, several DAOs see outsourcing solid waste management as a way to raise their revenues. Numerous DAOs require contractors to pay the DAO a pre-determined amount each month from the fees that they collect. These funds boost budgets, but they have unintended consequences. These charges reduce the profitability of collection. To offset the losses, contractors are likely to charge extra from households and businesses or try to cut their costs by reducing the coverage and reliability of their collections. If state and regional governments are concerned by this then they should consider other ways to increase the budgets of municipalities. Some have pursued municipal tax reform to raise revenues and others have provided a one-time transfer to fund the purchase of garbage trucks.

4. As is the case in many countries, outsourcing has not lowered user fees, it has shifted the cost burden around. Experience from many countries demonstrates that users pay similar or higher fees when a private contractor is used. This is because private contractors are trying to maximize their revenues and because in many cases municipalities had previously been running their MSW services at a financial loss that was only possible because they could cover these losses from other revenue sources.

5. Outsourcing carries considerable risks and it creates a new set of technical demands for municipal governments which have to design, tender, and monitor an ongoing service contract. Addressing these demands will require skilled staff and new processes. If they are not addressed, then contractors are likely to reduce the coverage or reliability of collection services to the detriment of households. Those considering outsourcing should consult with DAOs that have experiences of these new roles and set in place a plan to develop these skills.

6. Myanmar's private sector does not necessarily have better implementation capacity than local government. Myanmar's economy has grown rapidly in recent years, but the private sector may not yet have the necessary skills or capital to provide better garbage collection services than the DAOs, particularly in small cities. Private sector implementation capacity has been a consistent challenge thus far in municipalities that have experimented with out-

sourcing. If private sector capacity is too weak to effectively complement municipal efforts, DAOs may wish to handle garbage collection themselves or consider breaking the work into smaller more manageable pieces.

7. As far as could be established in the course of this project, none of the outsourcing of waste collection to date has been fully transparent or competitive. Transparency encourages public scrutiny which in turn can improve contracts, while building more public trust in the outsourcing process. Similarly, a public tender will invite more competition into the bidding process, which potentially gives the DAO a better set of options to choose from.

8. By paying for the privilege of collecting garbage, private contractors take on all the risk and receive little or no reward. DAOs that choose to outsource should instead design contracts that align the incentives of the public and the private sector by equal sharing of risks and rewards, together with effective monitoring mechanisms to ensure compliance. Without a properly aligned incentive structure, DAOs are more likely to experience issues with contractors. Governments should not be surprised when private contractors take measures to raise their profits, and should instead design their contracts and monitoring mechanisms on the assumption that this will happen.

9. If a DAO chooses to outsource, having the contractor collect the garbage fees reduces the DAOs' ability to fine the contractor for poor performance. Without an ability to deduct payments, DAOs would have to rely on the courts to settle contracting disputes – something that few are willing to do. This results in limited enforcement of fines in the face of breach of contract. DAOs should continue collecting fees because this internalizes financial information and potentially strengthens the social contract between community members and the municipal government.

10. Myanmar has seen mixed results from outsourcing waste collection so far, which suggests that the private sector may be better utilized in other forms of MSW management. Municipalities may invite the private sector to provide specific services such as waste segregation and the introduction of new technologies, or they can use a Public-Private-Partnership (PPP) model to share the cost of upgrading MSW infrastructure.[56] To avoid falling into pitfalls associated with weak private-sector capacity, any PPP or outsourcing experiments should be gradually scaled up over time.

11. There are many possible benefits from decentralizing aspects of MSW management to the ward level. Because of their closeness to the local community, ward administrators in collaboration with 100-household-leaders may be better able to collect fees, monitor garbage collection, and overall, build better trust between the community and local government. At the ward level they are also better able to implement localized solutions, i.e. buying appropriate equipment, and can more readily pursue small-scale outsourcing. Lastly, in cities where wards play a bigger role, their waste management efforts can be easily plugged into a well-built secondary collection system managed centrally by the DAO. This would allow for a clearer separation of responsibilities and specialization of tasks. However, this requires that ward level groups are willing and able to manage the operation.

iii. Wider Solid Waste Management

1. Good development of primary and secondary collection infrastructure is vital as it provides the foundation for effective waste management. In small towns, a network of smaller vehicles such as thone-bane and push carts can for example ferry solid waste to larger trucks which then take it to a landfill. Thorough primary collection infrastructure like this is complementary to community-based waste management reforms and can be used to promote waste segregation. In larger cities, proper secondary collection infrastructure will likely include the construction of transfer stations and the use of large trucks. The optimal design is context-specific and will depend on the geography of each city, budget limitations, and their ability to negotiate with local residents on the location of transfer stations.

2. Composting of organic waste is a cheap front-line intervention which can greatly reduce strain on the environment and built infrastructure. In Surabaya, Indonesia, for example, the city used a community-based approach to segregate garbage at the primary level, which resulted in a 25 percent reduction in waste generation over a 15-year period, even as the urban population grew. That means less money spent on fuel and labor, less wear and tear of urban roads, and less solid waste going to landfills. In turn, less organic waste going to landfills means less toxic leachate flowing into the groundwater and longer landfill lifespan.

3. Informal waste pickers are an under-used resource. Myanmar has thousands of informal waste collectors and waste sorters who have valuable experience and are connected to the formal and informal scrap (recycling)

Figure 7

market. They are also willing to do an unpleasant job that most people would not undertake. This makes waste pickers a valuable labor resource. This is seen also in the city of Pune in India where the local waste pickers' association manages waste collection for 350,000 of the city's 900,000 households at a cost of just INR 10 (USD 0.14) per household per month.

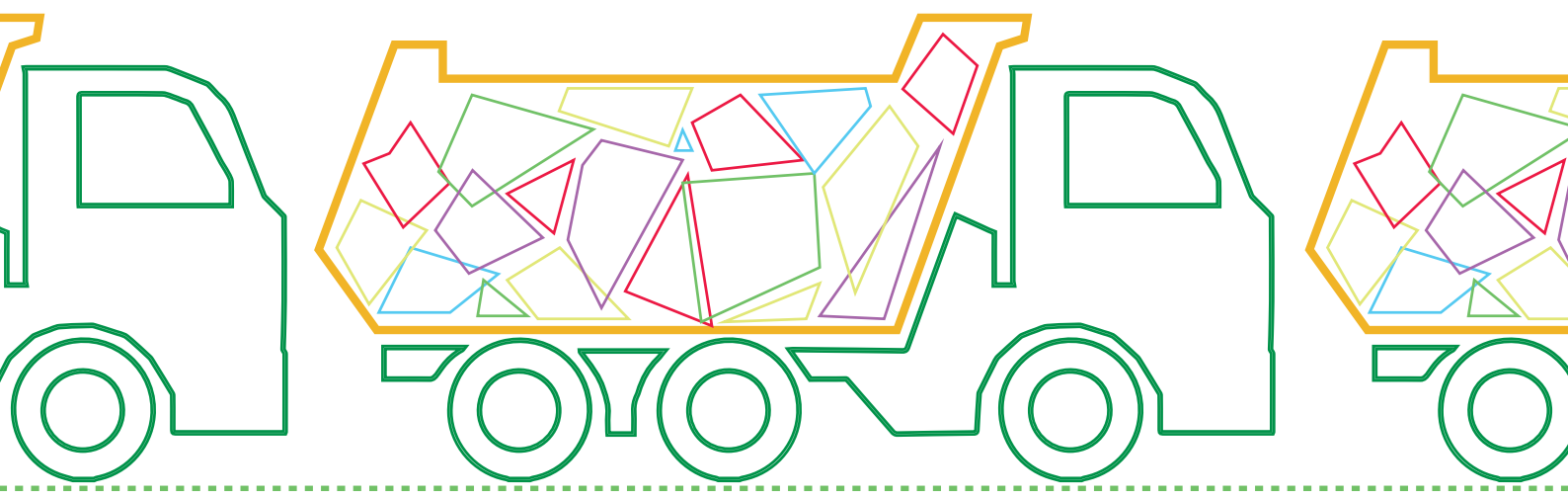
4. Increasing local community engagement can strengthen waste management reforms. Local community involvement can improve a wide variety of processes ranging from garbage fee collection, monitoring, and waste segregation, to reducing open dumping. For Myanmar, this would likely be at the ward or sub-ward level. Ward administrations can even carry out localized outsourcing based on the most appropriate technology and cost-structure. Other community stakeholders such as local NGOs or sections of the private sector can also act as important partners in reform by sharing their financial and human resources to implement new and creative approaches. DAOs could therefore seek to involve local communities and other stakeholders in waste management reforms.

5. Consider professionalizing the role of ward administrators. Ward administrators are the main point of contact with local government for most residents and help with a wide variety of tasks. Although the position is a formal role, it does not include a full-time salary or require formal training. Still, many ward administrators dedicate a lot of time to the role. Experiences in Hpa-An and Monywa indicate that it can be very valuable for the municipality to further engage with and potentially devolve responsibilities to ward administrators. It is also likely that professionalizing the role – i.e. providing formal training and higher pay – could strengthen local government with respect to MSW management as well as other tasks.

6. The Union government can take bolder action on waste management. Experience in India, which introduced stringent municipal solid waste legislation in 2000, suggests that making it a legal requirement to collect and safely dispose of waste can galvanize municipal authorities into effective waste management reform. Although such reforms would inevitably require more funding from Union and State/Regional governments, DAOs are perfectly positioned to experiment with new cost-effective solutions that best fit the local context. An example of this is the semi-sanitary landfill built in Pyin-Oo-Lwin which used low-cost materials built in-house by the DAO, based on adapted technology from Japan.

7. Municipal waste management reforms should be based on an evidence-based assessment of the relative costs, benefits and risks of different policy options. Good practices from Myanmar and abroad can offer valuable lessons, but they are inherently context-specific and so care must be taken before trying to replicate or scale them to other cities. Appropriate evidence-based assessments of waste management projects can potentially save scarce public resources from being used on projects that are unlikely to live up to expectations. The analytical model developed in this paper is an example of a tool that can help municipalities work through the complexities and assess how to go about reforming their waste management system.

ANNEX



ANNEX 1 - The Economics of Municipal Solid Waste Outsourcing

i. Introduction

This section provides a technical overview of relevant economic theory and research on MSW management and outsourcing. While governments may bear ultimate responsibility for the provision of a particular service, the question remains whether government should directly provide that service. Outsourcing refers to when a government institution contracts an entity from the private sector to carry out a given task or service. The original logic of outsourcing was that by introducing market mechanisms into the provision of public services, these services can be provided on a more competitive and therefore cheaper basis. This should result in reduced public expenditure, giving municipal governments much-needed financial breathing space to provide other services. However, many studies have found that outsourcing does not result in lower costs for government, or lower fees for consumers.[57,58] This section delves deeper into the underlying problems with the incentive structures that outsourcing may create, and draws relevant lessons.

There is no general theory of public outsourcing per se, and the relevant literature indicates that it is impossible to draw generalizable conclusions. Jensen and Stonecash note, "the success of each outsourcing exercise depends on the specific characteristics of a particular service environment."[59] Any lessons gleaned from the economic literature will therefore be broad and will need to be interpreted within the context of Myanmar's unique economic, political and institutional landscape.

Box 10: Markets and Market Mechanisms

Economics is the study of how societies allocate resources amongst competing needs. In economic literature, markets refers to the means by which buyers and sellers come together to exchange goods or services (whether through direct contact or indirectly through an intermediary). In an ideal market, buyers and sellers exchange goods and services to maximize the benefit they get from consuming a good or service, or the profit acquired from selling them. Market mechanisms refers to how actors behave to maximize their returns. For firms, this is the competitive drive to maximize profits by cutting costs or innovating. In many developed countries the rational for outsourcing or privatization is to introduce market mechanisms to public service delivery in the hope of increasing efficiency.

The main difference between privatization and outsourcing (also known as contracting or contracting out) is that the former involves a transfer of assets, and is usually a permanent arrangement. In contrast, outsourcing does not involve the sale of public assets and contracts generally include a specific date at which the arrangement ceases. It is worth noting that neither outsourcing nor privatization can be considered a public-private partnership (PPP), as PPP refers to arrangements where governments and private actors collaborate on funding and operating capital-intensive infrastructure projects (the asset is typically operated by a private entity even while ownership remains public). Given that municipal governments usually do not transfer, co-own, or rent out assets for MSW contracting (i.e. collection vehicles), this review is primarily concerned with the outsourcing literature.

Box 11: MSW Management as a Collective Action Problem

Garbage collection may suffer from what is known as a collective action problem, which refers to when people are better off cooperating – in this case, by all paying their waste collection fees and not littering – but fail to do so because each individual also has an incentive not to. If everyone disposes of their garbage safely and pays for it via fees or taxes, the municipality can provide better service to them. However, any given person can avoid this cost by evading fee collectors or simply dumping their garbage in the street. This is known as free-riding. The economist who popularized the term 'collective action problem,' Mancur Olson (1971), also pointed out that as group size increases, the social norms and informal sanctioning systems that encourage cooperation weaken. In this case, this means it becomes harder for municipal authorities to enforce compliance. If too many people free-ride, municipal authorities may be seen as failing in their duty to keep the city clean, which encourages even more shirking. This creates a bad status quo in which municipalities can get 'stuck', i.e. whereby they cannot afford full service coverage but also struggle with increasing fee collection.

ii. Garbage Collection as a Natural Monopoly

Broadly speaking, the choice over whether to outsource a given public service or not revolves around the question of whether introducing market mechanisms can provide the service more effectively or efficiently. In other words, can a private company do a better job than the government, or at least as good a job, at lower cost? There are two main reasons why outsourcing may not achieve the required result. The first arises from the fact that municipal waste collection is widely considered a local natural monopoly, which refers to when a market has high upfront costs that are recovered over long periods of time and by serving a large number of people. It may be difficult for private firms to afford such upfront costs. In addition, it would be inefficient for multiple service providers to compete against one another within the same geographic area. This is why municipal governments typically (although not always) arrange for one monopolistic service provider – whether public or private – to collect household waste.[62,63]

In developing countries like Myanmar the local natural monopoly is in a sense limited by underdeveloped markets, lack of capital, and cheap labor costs. The private sector – especially in small towns – often lacks the capital and experience needed to handle large projects such as managing waste collection. This means that outsourcing would likely need to start with partial coverage before scaling up. In turn, scaling up too fast risks outpacing the capacity of the contractor.[64] This limits the number of private firms, if any, that can bid for a large garbage collection tender. Given that Myanmar has very low labor costs – the official minimum wage remains the lowest in the region, even after being revised upwards in 2018[65] – it is likely to be more economically efficient to use labor-intensive technologies such as pushcarts or small three-wheeler trucks in the foreseeable future. This keeps the barriers of entry lower, as long as the contract size (i.e. the area that the contractor has to cover) is kept manageably small.

In contrast to Western cities where exclusive rights to an entire city are contracted out to preserve economies of scale (see Textbox 12), Myanmar towns may benefit from outsourcing garbage collection in urban sub-divisions. This would preserve the 'natural monopoly' of waste collection in each urban zone – where a given contractor would have exclusive rights – while encouraging competition between smaller firms vying to win a contract, (in turn, giving the

municipal government more bargaining power). This, however, could also create an unreasonably large administrative burden for DAOs which would have to manage multiple tenders and contracts. Without proper tendering procedures, the risk of corruption and nepotism could increase since there would be more contracts to win. In an extreme case, a poorly managed system could even lead to open dumping by one firm in another firm's zone – a firm-level case of free-riding.

One potential solution to avoid an increased administrative burden for DAOs is a more grassroots based approach where the local community or ward administration takes responsibility for waste collection. This is explored further in Section 3 and Section 4. In brief, it has been shown in some Myanmar towns that outsourcing at the ward level is relatively efficient exactly because it adopts a localized, zoned, low-tech approach. It should be noted that with localized outsourcing, it is more efficient for a contractor to focus on primary collection while the municipal government manages secondary collection. In effect, this already happens in some urban areas such as parts of Bahan township in Yangon, where an informal contractor charges households for door-to-door collection and then hands the waste to Yangon City Development Committee (YCDC) municipal workers to transport it to dumpsites.

Box 12: Economies of Scale

Economies of scale *refers to reduced cost per unit output that arises from increased total production. For example, a large factory can usually produce T-shirts at a lower unit price than a smaller factory. This is because larger firms can rely more on specialization of different tasks, order supplies in bulk, and spread functional costs like administration, marketing, and research across more units produced. This also applies to services such as garbage collection, where a provider can save money when covering a wider area, by using its physical and human capital more effectively. For example, when servicing more clients in a geographic area, a firm may be able to invest in bigger trucks, newer technology, and better-skilled workers.*

iii. Agency Problems

The second reason why outsourcing to a private contractor may not be more effective or efficient is that it necessarily entails agency problems. This concept, first developed by Jensen and Meckling in 1976, refers to situations where an "agent" (i.e. a contractor) operating on behalf of a "principal" (municipal authority) has a motive to act in contradiction to the principal's best interests. This is mainly due to the presence of misaligned incentives.

To use a simple example, a municipal authority wants to see the highest number of households reached, at the best quality of service, for the least cost. If the contract states that the contractor is paid a fixed amount every year according to a set of deliverables (say, covering all urban wards), then the contractor has an incentive to work only the bare minimum until those deliverables are met and no further. This could for example mean that the contractor only partly covers some wards, or ignores newly built houses at the urban fringe. The contractor also has an incentive to reduce the quality of service

to save costs by, for example, reducing the frequency of collection. The time spent by the principal trying to address the various problems (i.e. time spent managing a contracting relationship, including design, tendering and monitoring and evaluation) are collectively known as agency costs. Taking the steps to avoid being taken advantage of by contractors can be both challenging and expensive for municipal authorities.

Agency costs can also arise as a result of information asymmetry (see Textbox 13). The main information asymmetry as it relates to outsourcing is that full information about fee collection and costs is privately held by the contractor. This means that the government often does not have accurate knowledge about the contractors' income or expenses, or indeed profitability, which makes it more difficult to draw up a contract that properly aligns incentives. While a contractor is expected to make some profits, if the profits are very large this implies that the government could have extracted more or better work from the contractor. However, municipal governments can "own" this information by designing a contract such that the municipality collects fees on behalf of the contractor and – if necessary – obliging the contractor to disclose its cost structure.

Box 13: nformation Asymmetry

Information asymmetry *refers to when one party to an economic transaction has more or better information than the other party. This is most typically seen where the seller of a good or service, such as a car salesman, has greater knowledge than the buyer. Almost all transactions have information asymmetries. Though such asymmetries are not inherently immoral, they may lead to sub-optimal decision-making.*

Much economic literature deals with moral hazard, a subset of information asymmetry which refers to how a principal's risk is tied to unobservable choices made by the agent. In other words, the principal can never be completely sure whether an agent will act in good faith in accordance with the spirit of an agreement. The risks can be both ex ante (before a deal or contract is signed) and ex post (after the fact). Municipal governments should be particularly concerned with ex post moral hazard; as noted by Kavčič and Tavčar, "in outsourcing contracts, the most common moral hazard is a reduction in the level of effort by the supplier (agent), resulting in lower service quality." [66]

Monitoring contract performance is generally considered one of the most effective ways of reducing ex post moral hazard. As Poppo and Zenger show, the difficulty or ease of measuring success is a key determinant of how well principals can govern a contract.[67] Monitoring can be tied into the financial incentive of the contractor by making their compensation performance-driven, i.e. tying how much the firm is paid to how well they perform against measurable outcomes.

Measuring MSW collection outcomes may be relatively simple in terms of say, frequency and coverage. Yet the costs of such monitoring may be high. This could be tackled by introducing the participation of local residents. Local community members have a vested interest in effective MSW management and can act as third-party enforcers that audit user-end service delivery. This can incentivize contractors to perform better with a view towards upholding their reputation[68] or to avoid fines. Community-based monitoring can be particularly valuable in a country like Myanmar where weak legal institutions may make it difficult to enforce contracts. It can also

ameliorate a lack of administrative capacity in municipal government. It is therefore important to build trust between the municipal authority and the communities they serve. Similarly, building trust with contractors is essential for building exchange relationships geared towards mutual value-creation.[69]

Another option to disincentivize opportunistic behavior by agents is to have the principal (i.e. municipal authority) have a high degree of involvement in the production of an outsourced service.[70] Besides monitoring and evaluation, this could include sharing the administrative burden and collection of fees. Anurag Sharma suggests that agents should be required to make investments in exchange-specific assets, i.e. to purchase garbage collection trucks.[71,72] This incentivizes the agent to ensure successful implementation of the contract, because the agents cannot readily deploy these assets in other exchanges (businesses), at least not without losing some of the assets' productive value. In contrast, if a contractor (the agent) rents the municipal government's equipment or takes over operations free of charge, the agent has much less to lose.

Box 14: Transaction Cost Economics

Another strand of relevant literature that accounts for agency problems is called Transaction Costs Economics (TCE). According to this perspective, firms and how they interact with individuals and markets are analysed in terms of transaction costs, i.e. the costs incurred from engaging in any form of business interaction. These costs arise due to information asymmetry.[73] For example, before buying a new car, most people spend a significant amount of time researching the comparative cost and quality of different models so that they can make an informed decision. Information asymmetries are a type of agency problem which – as highlighted in this section – increases the cost of outsourcing an external contractor due to the need to negotiate, monitor and enforce contracts,[74] as well as "the management costs of governing these exchanges,"[75] meaning the time it takes for administrators to manage all of these processes. These costs may be particularly high if the contract is complex. The TCE literature therefore concludes that public services should only be outsourced if it maximizes performance in terms of the transaction costs. In other words, the government should only outsource a service to an external contractor if the transaction costs of doing so are lower than the transaction costs of performing the service in-house. Some authors therefore argue in favor of public provision of services because "the costs of directly managing municipal workers are [often] less than the costs of managing outside contractors."[76]

Total transaction costs of different options also need to be evaluated relative to expected service-level gains. Conversely, if the contractor is likely to do an inferior job, then this needs to be included in the calculations. As explained by the Asian Development Bank (2016), empirical evidence suggests that outsourcing MSW collection is unlikely to provide significant cost savings.[77] Nevertheless, it should still be pursued if the private sector can offer "value for money" whereby the service level improves proportionally more than the costs.[78] In such a case, where the cost of outsourcing is equal or greater than the cost of doing it in-house but the contractor can increase performance in terms of quality and/or quality, a municipality should outsource since it would result in lower cost per ton of waste collected. In context of the low coverage of MSW collection in many townships in Myanmar, this means that municipalities should consider outsourcing only if the private contractor is able and willing to invest enough to provide better service that covers the entire city, thus creating economies of scale.

iv. Contract Design: Risk, Incentives, and Efficiency

Another theoretical field which helps illuminate how to overcome agency problems is contract theory. Contract design is an important determinant of success for outsourcing services. Due to the concept of incomplete contracting (see Textbox 15), no written contract can ever take into account any and all agency problems. If unforeseen circumstances arise, a contractor may for example use contract re-negotiation to force the government to accept a price increase – commonly referred to as 'hold-up.' However, a contract can deal with many agency problems and transactions costs by creating an incentive structure that aligns the interests of the principal and the agent, and to overcome information asymmetries. As explained by Jensen and Stonecash,[79]

The observation that efficient contracts involve balancing risk and incentives is well known in labour and information economics, but is often overlooked in the outsourcing literature. In the presence of uncertainty, the principal is not able to distinguish between the effects of the agent's effort and random events on output. In this case, contractual relationships involve a moral hazard problem. To overcome the moral hazard problem, the government may transfer risk to the private sector, but this comes at a price, because risk-averse firms will charge a premium for bearing risk. As the level of uncertainty increases, the risk premium increases, and risk-sharing arrangements become more efficient. In other words, contract theory predicts a trade-off between risk and incentives.

To put it in simpler terms, the contractual relationship between the municipal government and the contractor must be beneficial to all parties by finding a balance that lowers uncertainty, shares risks and rewards, and ensures good quality service provision.

Box 15: No Contract is Perfect

According to the incomplete contracting paradigm, no contract between two entities can ever be "complete" because, in practice, a contract cannot possibly specify conditions for every conceivable contingency. According to Hart (1995), "an incomplete contract has gaps, missing provisions, and ambiguities and has to be completed (by renegotiation or by the courts) with strictly positive probability in some states of the world." This opens up the way for opportunistic behavior by either one or both parties, especially in the long term, as the nature of the task may change. However, opportunism may be mitigated by, for example, choosing a suitable ownership structure in case of a public-private partnership or by aligning the incentives of the principal and the agent.[80]

It is important that the tendering process for a contract is competitive. Although MSW management services are often outsourced to one contractor for an entire city (due to it being treated as a natural monopoly), competition can still be introduced in the tendering process by making it open and transparent. In other words, it should be possible for any firm to make a bid for the contract, and the contract details should be available for public scrutiny. This encourages firms to offer higher quality service at a lower cost than potential competitors. In a similar vein, the contract duration should be made for the shortest time possible, i.e. the time it will take the contractor to recuperate the capital invested in buying equipment. After the time period, the contract should be re-tendered to ensure that the service is provided at the lowest possible cost.

Box 16: Rewards and Incentives

In the context of contract theory and waste management, rewards refer to the user fees paid for garbage collection which are typically collected by the government. However, in countries like Myanmar where user fees are low and irregularly collected, the municipal authority is effectively subsidizing waste collection, and may need to continue to do so if/when outsourcing, to avoid price hikes. In the spirit of creating a mutually beneficial relationship, this means that the government may need to offer additional incentives to contractors to expand coverage if user fee revenues are too low. Incentives are what motivate an individual or firm to act in a certain way, and for firms typically refer to a financial gain (although they can also be non-monetary motivations, such as social status).

Contractors face other uncertainties such as incomplete fee collection, congestion, "acts of god" (i.e. natural disasters like flooding), etc. A sustainable contract should be designed so that these risks are shared with the government while maintaining sufficient incentive (income) for the contractor to maintain normal profits. Otherwise, contractors may pass the risk premium on to consumers in the form of higher fees or lower service provision. Fortunately, MSW collection enjoys relatively low so-called volume uncertainty because the user base is consistently large, and even expanding. This enables firms to better utilize economies of scope and scale, but requires a level of flexibility in the contract design.

It should be noted that it is harder to write a complete contract for service provision than construction provision, i.e. it is more difficult to contract out the building of, for example, a prison than to run one, because the quality of the building can be more readily specified than the quality of managing it. In practice, this means it will be significantly more costly to administer, write, tender, and monitor a continuous service contract for MSW collection than for managing the contracts for, say, constructing a road or new office building. Results-oriented service contracting is, simply put, cumbersome.

v. Organizational Constraints

Organizational reform and capacity building is a key component of development but is neither easy nor straightforward. This is even more pronounced in Myanmar where public organizations suffered from neglect for more than half a century. Many municipalities therefore lack both the money and the administrative capacity to undertake large capital-intensive projects such as waste collection reform.

Municipalities in Myanmar have limited budgets. Urban waste collection is expensive and is typically one of the single largest current expenditure items for DAOs. Moreover, DAOs tend to be understaffed and have weak human resource capacity, which makes it difficult for them to administrate complex projects. On the one hand, this makes it difficult for municipalities to improve the waste management supply chain all on their own. On the other hand, it also makes them unlikely to be able to effectively plan, design, tender, and monitor complex outsourcing contracts.[85] To put it in slightly more technical terms, many DAOs will be unable to meet the transactional costs of undertaking proper waste collection reform, regardless of whether it is done internally or by an external contractor.

Moreover, Myanmar's economy is still undergoing early market reforms. The private sector may therefore be too nascent to have the capacity to provide the necessary service coverage or raise sufficient capital for investment, particularly in smaller townships. As noted by Anderson (2011: 13), "in many developing countries the private sector solid waste management industry is not well developed and the ethical framework [of society] is often inadequate to minimize collusion and procurement irregularities."[86] If both public organizations and the private sector are weak, then neither can facilitate effective service provision with low transaction costs.

A legal system is also an important institutional requisite for developing a market-based economy.[87] Without a well-functioning legal system,[88] contracts are difficult to enforce and disputes cannot be readily resolved. (In the World Bank's 2019 Ease of Doing Business report, Myanmar was ranked 171 out of 190 economies, and scored most poorly in enforcing contracts, at 188 out of 190). This may make both the private sector and municipal government sceptical about their mutual ability to prevent abuse or neglect of a legal contract. In particular, abuse of government contracts is very likely in "criminogenic" environments that have endemic corruption and inadequate transparency.[89] This makes it even harder to develop or enforce sufficient controls to avoid abuses of tendering processes. In, for example, Kampala, the capital of Uganda, corruption harmed MSW collection efforts by public and private sector operations alike.[90] Municipal governments therefore need to take steps to ensure sufficient transparency before contracting out service provision

Box 17: Transparency in Outsourcing of Public Services

There are many ways in which outsourcing municipal waste collection can be made more transparent. The chief ways are to announce the tendering process in advance, make relevant documents available for free, and make the eventual contract publicly available for scrutiny. However, the local community can also be brought in as a third-party stakeholder to improve monitoring and transparency: directly, by setting up supervisory committees or communal waste collection associations, or indirectly, by setting up residents' reporting mechanisms. Moreover, increasing residents' participation through community monitoring creates a sense of ownership in the management of public spaces. In the long term, building a relationship with the community based on transparency and mutual trust can create other positive results such as, for example, making it easier to create campaigns to sort and reduce waste.

vi. Problems with Outsourcing

In spite of the many benefits promised by champions of outsourcing, the practice has many critics. This is because outsourcing may lead to increased costs for the government and/or lower-quality service delivery. This section will briefly explain four potential pitfalls of outsourcing waste collection.

1. Quality Shading

Outsourcing a given service may lead to so-called quality shading, which refers to deterioration in the quality of service. This occurs either because the contractor has a stronger incentive to cut costs than to increase quality[91] or because it focuses on one main activity that is easy to measure (to increase its reward) while reducing efforts in other areas.[92,93] An example of the former would be to cherry-pick the easiest households to collect garbage from. An example of the latter would be to expand collec-

tion service to more neighborhoods, but reduce collection frequency. Quality shading may arise as a resultof poor contract design that failed to include appropriate quality specifications or adequate monitoring, in which case it is (theoretically) preventable.[94] Savings may also be transitory, which means that they are gradually eroded over time when, for example, firms ratchet up prices once the government has gotten rid of its own municipal waste workers.[95]

2. Reduced Worker Compensation

Another potential pitfall is that cost savings are gained through reducing worker compensations, either due to a reduction in real wages or by increasing demands on worker effort. This is also known as the redistribution hypothesis, since it constitutes a transfer payment from workers to managers.[96] If savings are grounded in redistribution as opposed to technology or productivity gains, then net social benefit may very well be negative.[97] Empirical studies across the outsourcing literature have shown that outsourcing contractors effectively pay their workers less (in monetary and non-monetary terms) than public servants, and expect more work effort,[98,99,100,101] creating poorer work conditions[102] that may lead to an increase in work-related injuries and industrial accidents.[103]

3. Public Service Motivation

Another potential reason for why outsourcing may fail to improve performance is that it relies on an assumption that the private sector always has stronger incentives to improve delivery than the public sector.[104] Research shows that human motivation is contingent on many psychological and social factors other than monetary compensation.[105] Public servants motivated by a concern for e.g. status or social impact may put in more effort, creating efficiency gains.[106] Thus the public sector may provide certain services more efficiently than the private sector, in spite of the fact that the benefits do not flow directly to the bureaucrats employed to handle them.[107,108] The lesson for government bureaucracies is that they may wish to keep certain services 'in-house' if they enjoy (or can create) a motivating work environment.

4. Costs are Unlikely to Fall

In some contexts, outsourcing may create efficiency savings.[109] A number of studies in Europe find cost savings of 10 percent to 33.5 percent - but most often around 20 percent – after taking into account quality shading and labor reductions.[110,111,112,113] However, a large-scale literature review determined that cost is ultimately not determined by whether or not MSW collection is provided in-house by the government or by an external contractor.[114,115] Evidence from developing countries similarly shows that outsourcing is unlikely to cut costs; this is why the ADB concludes that outsourcing waste management should only be considered as a stop-gap solution for when municipal governments have insufficient capacity to provide full service coverage.[116]

The often contradictory results in the MSW outsourcing literature arise from various data limitations plus the fact that MSW is an inherently context-driven process. One data problem is that there is an inherent heterogeneity in the quality and quantity of service levels in different places.[117] Furthermore, the public sector often lacks data on its operating costs and outputs.[118] Much of the literature on MSW management and outsourcing relies on empirical studies from Western Europe, Australia, and other high-income economies which may not translate to lessons for developing-country economies. Success or failure of outsourcing experiments will necessarily depend on local political and economic context.

Overall, it is difficult to draw conclusions on whether or not outsourcing can offer cost reductions or improved services to a given municipality. As highlighted in this chapter, results depend on extremely varied factors, including the local political-economic context, the respective motivations of each stakeholder, the construction of financial and immaterial incentives, and various skill, resource, legal and institutional capacity constraints. Therefore it may be concluded that the best way forward for those townships in Myanmar that are short on capacity and wish to implement outsourcing is to keep experimenting with different contract designs in an open and accountable manner – based on the lessons summarized in this chapter – and to avoid large, inflexible, or long-term contracts.

vii. Policy Lessons

This sub-section provides a summary of practical lessons that can be gleaned from economic theory and relate to how municipalities can best approach, design, implement and monitor outsourcing contracts. Although the literature is based on economic research abroad, care has been taken to structure the findings in the political economic context of Myanmar.

1. View outsourcing as a solution to weak public sector capacity, not as a cost-saving mechanism. When properly conducted with thorough tendering, contract design and continuous monitoring and evaluation, outsourcing MSW collection is unlikely to lower the administrative burden or cost for the municipal authority. Similarly, proper waste collection coverage is expensive and private contractors are usually unable to undertake it at a lower cost than the municipal government. Outsourcing may nevertheless still be effective if it improves the quality or scope of service delivery. It should therefore primarily be viewed as a stop-gap solution to weak public sector capacity (i.e. small budgets and small garbage truck fleets) when municipalities do not have the means to improve service provision.

2. Yet firms in Myanmar are also likely to face considerable challenges in operating large scale collections. Setting up city-wide waste collection infrastructure requires the ability to leverage sufficient capital investment to purchase necessary equipment and hire capable human resources. This is unlikely to be the case amongst small to medium sized firms, as are present in smaller towns in Myanmar, due to difficulties in accessing credit. However, unlike advanced economies where waste collection forms a natural monopoly,[119] Myanmar has cheap labor and experience using small collection vehicles, which means that municipalities may achieve efficiency by contracting waste collection at a smaller scale, such as the ward level.

3. Carefully design contracts to align the incentives of the contractor and the municipality. This is done by sharing risks and rewards in such a way that both groups find the arrangement works for them. For risks, for example, this means taking into account how to deal with unforeseen circumstances and the likely future changes in the size and complexity of cities. For rewards, it means that both parties benefit from improved service provision by making sure the contractor is rewarded fairly. A common way of achieving this is to build performance-based contracts combined with a continuous monitoring system. When incentives are misaligned, contractors will reduce the reach or frequency of their collections because it is not profitable for them. The quality of the monitoring mechanism is often a key determinant of how successfully a contract is governed.

4. Municipal authorities should re-evaluate existing practice of outsourcing the collection of fees to private contractors. DAOs relinquish financial control when they do not collect fees on behalf of private contractors and undermine incentives for performance. DAOs give up their ability to impose the fines written into their contracts for poor performance – and DAOs are unlikely to take contractors to court due to deficiencies in the legal system. Outsourcing fee collection removes the immediate frustration faced by DAO staff who often struggle to collect fees. However, this may result in lower overall collections and so lower coverage. An argument can also be made that DAO collection of fees helps reinforce the social contract between residents and the city. It also gives the municipality complete information about revenues, which makes it easier to negotiate, monitor, and evaluate contracts.

5. Make the tendering processes competitive and transparent. Competitive tendering creates competition between potential contractors, thus lowering costs and/or improving the quality of bids. Transparency creates better contract scrutiny, which may improve contract design.

6. Limit contract duration to the time required to recoup the contractor's capital investment costs. It is in the interest of the municipal government to keep contracts short so that the market remains competitive and allow new contractors – which may be able to operate more efficiently – to make bids. Conversely, however, a contract that is too short – such as a year or two – does not offer the contractor an opportunity to recuperate capital costs. The municipality should therefore limit the contract to the cost recuperation period (based on projected earnings) because it is the minimum duration contractors may be willing to commit to. Another alternative is to include a break clause within contracts so that at a predetermined point in time both parties to the contract can decide whether or not they want to continue with the contract. This can also provide a point for them to re-negotiate elements of the contract in light of the changes that will have occurred since the initial contract was signed.

7. Develop strong relations with different stakeholders to create better contract enforcement and improve overall waste management. Building a good relationship with the contractor based on mutual trust will encourage the contractor to perform better, while continuous community engagement will make people more likely to engage in good waste management practices. Collaboration with local communities can also improve contract monitoring.

Bibliography

Acemoglu, D., Kremer, M. and Mian, A. 2004. Incentives in markets, firms, and governments. *The National Bureau of Economic Research, NBER working paper 9802.*

Ahmed, S. A., and Ali, M. 2004. Partnerships for Solid Waste Management in Developing Countries: Linking Theories to Realities. *Habitat International, 28(3): pp. 467–479.*

Anderson, B. 2011. Privatisation: a formula for provision or perversion of municipal solid waste management. *Clear Impression Documentation Services.*

Arnold, M., Aung Y. T, Kempel, S. Saw, K. P. C. 2015. Municipal Governance in Myanmar: An Overview of Development Affairs Organizations. *The Asia Foundation, Policy Dialogue Brief Series no. 7.*

Aubert, B. A., Rivard, S. and Patry, M. 2003. A tale of two outsourcing contracts. *Wirtschaftsinformatik,* 45(2): pp. 181–190.

Aubert, B. A., Rivard, S., and Patry, M. 2004. A transaction cost model of IT outsourcing. *Information & management,* 41(7): pp. 921–932.

Asian Development Bank (2016. Integrated Solid Waste Plan – Mandalay. Prepared by AECOM on behalf of ADB.

Asian Development Bank 2017a. Integrated Solid Waste Management for Local Governments: *A Practical Guide.*

Asian Development Bank 2017b. *Case Studies in Private Sector Participation: Solid Waste Management.* Pacific Private Sector Development Initiative.

Bel, G. and Warner, M. 2008. Does Privatization of Solid Waste and Water Services Reduce Costs? A Review of Empirical Studies. *Resources, Conservation and Recycling,* 52(12): pp. 1337–1348.

Bissinger, J. 2016. *Local Economic Governance in Myanmar.* The Asia Foundation.

Climate and Clean Air Coalition (CCET). 2017. *Planning and Implementation of Integrated Solid Waste Management Strategies at Local Level: The Case of Surabaya City.* IGES Centre Collaborating with the United Nations Environment Programme (UNEP) on Environmental Technologies (CCET).

Chen, M. and Ijjasz-Vasquez, E. 2016. A virtuous circle: Integrating waste pickers into solid waste management. *World Bank: Voices – Perspectives on Development*, accessed 22 February 2019. *http://blogs.worldbank.org/voices/virtuous-circle-integrating-waste-pickers-solid-waste-management.*

Cope, S. 1995. Contracting-Out in Local Government: Cutting by Privatising. *Public Policy and Administration,* 10(3): pp. 29–44.

Deccan Herald 2015. "Residents protest reopening of Mavallipura landfill site." DeccanHerald.com, accessed 29 March 2019. *https://www.deccanherald.com/content/452974/residents-protest-reopening-mavallipura-landfill.html.*

Dijkgraaf, E. and Gradus, R. H. 2003. Cost Savings of Contracting Out Refuse Collection. *Empirica,* 30(2): pp. 149–161.

Dobermann, T. 2016. *Urban Myanmar. International Growth Centre.*

Domberger, S., and Jensen, P. 1997. Contracting out by the public sector: theory, evidence, prospects. *Oxford Review of Economic Policy, 13(4): pp. 67–78.*

Domberger, S., Jensen, P. H. and Stonecash, R. E. 2002. Examining the Magnitude and Sources of Cost Savings Associated With Outsourcing. *Public Performance & Management Review,* 26(2): pp. 148–168.

Fairris, D. and Brenner, M. D. 2001. Workplace Transformation and the Rise in Cumulative Trauma Disorders: Is There a Connection? *Journal of Labor Research* 22(1): pp. 15–28.

Fehr, E. and Falk, A. 2002. Psychological Foundations of Incentives. *European Economic Review,* 46(4-5): pp. 687–724.

Francois, P. 2000. 'Public Service Motivation' as an Argument for Government Provision. *Journal of Public Economics,* 78(3): pp. 275–299.

Glaeser, E. L. 2010. "Introduction." In *Agglomeration economics* (pp. 1–14). University of Chicago Press.

Glaeser, E. L. and Joshi-Ghani, A. 2013. *The Urban Imperative: Toward Shared Prosperity.* The World Bank.

Golooba-Mutebi, F. 2003. Devolution and Outsourcing of Municipal Services in Kampala City, Uganda: An Early Assessment. *Public Administration and Development,* 23(5): pp. 405–418.

Gooptu, N. 2013. Servile Sentinels of the City: Private Security Guards, Organized Informality, and Labour in Interactive Services in Globalized India. *International Review of Social History,* 58(1): pp. 9–38.

Gray, C. W. 1997. Reforming Legal Systems in Developing and Transition Countries. *Finance and Development,* 34: pp. 14–16.

Haas, A. and Collier, P. 2017. Financing Fast-Growing Cities. IGC: *Growth Brief,* accessed 22 February 2019.
https://www.theigc.org/reader/financing-fast-growing-cities/tapping-well-administered-diverse-local-sources-revenue-can-decrease-cities-reliance-central-government-transfers/

Hart, O. 1995. Firms, Contracts, and Financial Structure. *Clarendon Press.*

Hart, O., Shleifer, A., and Vishny, R. W. 1997. The Proper Scope of Government: Theory and an Application to Prisons. *The Quarterly Journal of Economics,* 112(4): pp. 1127–1161.

Hart, O. 2003. Incomplete Contracts and Public Ownership: Remarks, and an Application to Public Private Partnerships. *The Economic Journal,* 113(486): pp. C69–C76.

Holmstrom, B. and Milgrom, P. 1991. Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design. *Journal of Law, Economics and Organization,* 7(Special): pp. 24–52.

Holmstrom, B. and Milgrom, P. 1994. The firm as an incentive system. *The American Economic Review,* pp. 972–991.

Hoornweg, D. and Bhada-Tata, P. 2012. *What a waste: a global review of solid waste management* (Vol. 15). World Bank, Washington, DC.

Huisman, H., Breukelman, H. and Keesman, B. 2017. *Myanmar Waste Scoping Mission Report.* Netherlands Enterprise Agency.

JFE. 2018. Waste to Energy Plant for Yangon City in Myanmar. *JFE Engineering Corporation/Kawasaki City.*

Jensen, M. C., & Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics,* 3(4): pp. 305–360.

Jensen, P. H. and Stonecash, R. E. 2005. Incentives and the efficiency of public sector-outsourcing contracts. *Journal of economic Surveys,* 19(5): pp. 767–787.

Jeske, F. 2017. *Waste Audit Report for Mandalay's Two Dumpsites.* ALARM.

Katusiimeh, M. W., Mol, A. P., and Burger, K. 2012. The Operations and Effectiveness of Public and Private Provision of Solid Waste Collection Services in Kampala. *Habitat International,* 36(2): pp. 247–252.

Kavčič, K. and Tavčar, M. I. 2008. Planning Successful Partnership in the Process of Outsourcing. *Kybernetes,* 37(2): pp. 241–249.

Lobina, E. and Hall, D. 2009. Thinking Inside The Box: *Why The World Bank is Not Learning.* Public Services International Research Unit, University of Greenwich.

Logan, M. S. 2000. Using agency theory to design successful outsourcing relationships. *The International Journal of Logistics Management,* 11(2): pp. 21–32.

MoLIP. 2017. Thematic Report on Population Projections for the Union of Myanmar, States/Regions, Rural and Urban Areas, 2014–2050 (Census Report Volume 4–F). *Ministry of Labour, Immigration and Population.*

Morton, J. 2017. Time to rethink how to harness the private sector to improve sustainable solid waste management. *World Bank: Sustainable Cities Blog,* accessed 22 February 2019. *https://blogs.worldbank.org/sustainablecities/time-rethink-how-harness-private-sector-improve-sustainable-solid-waste-management.*

McDonald, L. and Hein, A. 2017. *Managing the Challenges of Rapid Urbanisation:* A Review of the Existing Property Tax System in Myanmar. Renaissance Institute.

Merickova, B. M., Nemec, J. and Soukopova, J. 2014. The Economics of Waste Management: Evidence from the Czech Republic and Slovakia. Lex Localis – *Journal of Local Self-Government, 12(3).*

MIT (n.d.). 2019. Solid Waste. *Environmental Strategies for Cities,* accessed 22 August 2019. *http://web.mit.edu/urbanupgrading/urbanenvironment/sectors/solid-waste-landfills.html.*

MNCR. 2014. 840 Waste Pickers Contracted to Recycle During the World Cup. *Movement of Brazilian Waste Pickers,* accessed 22 February 2019. *http://globalrec.org/2014/06/11/840-waste-pickers-contracted-to-recycle-during-the-world-cup/.*

Morton, J. 2017. Time to rethink how to harness the private sector to improve sustainable solid waste management. *World Bank: Sustainable Cities Blog,* accessed 22 February 2019. *https://blogs.worldbank.org/sustainablecities/time-rethink-how-harness-private-sector-improve-sustainable-solid-waste-management.*

News 18. 2011. “Review of outsourcing of solid waste management." News18.com, accessed 29 March 2019. *https://www.news18.com/news/india/review-of-outsourcing-of-solid-waste-management-430218.html.*

OECD. 2013. *Waste Management Services.* Policy Roundtables, DAF/COMP(2013)26.

Olson, M. 1971. *The logic of collective action: public goods and the theory of groups* (2nd ed.). Harvard University Press.

Pack, J. R. 1989. Privatization and Cost Reduction. *Policy Sciences* 22: pp. 1–25.

Passas, N. 2007. *Corruption in the Procurement Process/Outsourcing Government Functions: Issues,* Case Studies, Implications. Institute for Fraud Prevention.

Poppo, L., and Zenger, T. 1998. Testing alternative theories of the firm: transaction cost, knowledge-based, and measurement explanations for make-or-buy decisions in information services. *Strategic management journal,* 19(9): pp. 853–877.

Premakumara, D. G. J., Hengesbaugh, M. Onogawa, K. and Hlaing O. M. T. 2017. *Waste Management in Myanmar: Current Status, Key Challenges and Recommendations for National and City Waste Management Strategies.* Institute for Global Environmental Strategies.

Quiggin, J. 1994. The Fiscal Gains From Contracting Out: Transfers or Efficiency Improvements. *Australian Economic Review,* 27(3): pp. 97–102.

Quiggin, J. 2002. Contracting Out: Promise and Performance. *Economic and Labour Relations Review,* 13(1): pp. 88–204.

Rastogi, V. 2018. *Minimum Wage Levels Across ASEAS.* ASEAN Briefing, accessed 22 February 2019.*https://www.aseanbriefing.com/news/2018/08/30/minimum-wage-levels-across-asean.html.*

Savas, E. S. 2000. *Privatization and Public-Private Partnerships.*

Sclar, E. 2000. *You Don't Always Get What You Pay For: The Economics of Privatization.* Cornell University Press.

Sharma, A. 1997. Professional as agent: Knowledge asymmetry in agency exchange. *Academy of Management review,* 22(3): pp. 758–798.

Starr, P. A. 1987. The Limits of Privatization. *Economic Policy Institute.*

The Asia Foundation. 2018. *City Life Survey: Myanmar 2017 Pilot Initiative.* The Asia Foundation.

The Asia Foundation. 2019. *Insight Into Urban Well-Being in Myanmar: The 2018 City Life Survey.* The Asia Foundation.

UCLG 2010. Surabaya, Indonesia: *Clean and Green Initiative.* United Cities and Local Governments.

Valley, I., Kyaw, H. A., Sandi, N. and McDonald, L. 2018. *Where the Rubber Hits the Road: A Review of Decentralization in Myanmar and the Roads Sector.* International Growth Centre/Renaissance Institute.

Walsh, J., and O'Flynn, J. 2000. Managing Through Contracts: The Employment Effects of Compulsory Competitive Tendering in Australian Local Government. *Industrial Relations Journal,* 31(5): pp. 454-470.

Winter, M. and Thin, M. N. 2016. *The Provision of Public Goods and Services in Urban Areas in Myanmar: Planning and Budgeting by Development Affairs Organizations.* The Asia Foundation/ Renaissance Institute.

Endnotes

[1] Daniel Hoornweg and Perinaz Bhada-Tata, What A Waste: A Global Review of Solid Waste Management (World Bank, 2012), ix.
[2] The slightly broader term Solid Waste Management (SWM) refers to the collection, treatment, and disposal of all solid waste material. However, in light of the fact that there are no waste disposal systems in rural areas, this paper prefers the term MSW or MSW management.
[3] It is worth noting, however, that liquid or industrial waste management facilities in Myanmar are inadequate. According to a 2016 study by the Institute for Global Environmental Strategies (IGES), "with the exception of central business districts, there is no conventional central waste water and sewerage collection and treatment system in the three major cities [of Yangon, Mandalay and Nay Pyi Daw]," which means that only a fraction of waste water in Myanmar is treated. Most industrial waste across the country is deposited in landfills without prior treatment.
[4] Hoornweg and Bhada-Tata, What A Waste; and own data.
[5] Dickella Gamaralalage Jagath Premakumara et al., Waste Management in Myanmar: Current Status, Key Challenges and Recommendations for National and City Waste Management Strategies (Institute for Global Environmental Strategies, 2017), iv.
[6] Hoornweg and Bhada-Tata, What A Waste, ix.
[7] Premakumara et al., Waste Management, 7.
[8] Friedor Jeske, Waste Audit Report for Mandalay's Two Dumpsites (ALARM, 2017).
[9] Premakumara et al., Waste Management.
[10] As pointed out by Winter and Thin in a 2016 report for The Asia Foundation, "DAOs effectively under-charge for key urban services [including waste management], and use the proceeds of license auctions to subsidize urban expenditures" (2016: 62-63). Given that auctions on for example butchery licenses extract revenue from both urban and rural residents, people living in rural areas are effectively subsidizing urban services. This represents a serious funding mismatch which could be solved by developing a self-financing MSW management model.
[11] Matthew Arnold, Ye Thu Aung, Susanne Kempel and Kyi Pyar Chit Saw, Municipal Governance in Myanmar: An Overview of Development Affairs Organizations (The Asia Foundation Policy Dialogue Brief Series no. 7, 2015), 6–7.
[12] Michael Winter and Mya Nandar Thin, The Provision of Public Goods and Services in Urban Areas in Myanmar: Planning and Budgeting by Development Affairs Organizations (The Asia Foundation/ Renaissance Institute, 2016).
[13] Ministry of Labour, Immigration and Population, MoLIP, (2017), Thematic Report on Population Projections for the Union of Myanmar, States/Regions, Rural and Urban Areas, 2014–2050 (Cen-

sus Report Volume 4-F).

[14] Edward L. Glaeser, "Introduction" in Agglomeration Economics (University of Chicago Press, 2010), 1–14.

[15] Edward L. Glaeser and Abha Joshi-Ghani, The Urban Imperative: Toward Shared Prosperity (The World Bank, 2013).

[16] Tim Dobermann, Urban Myanmar (International Growth Centre, 2016).

[17] Premakumara et al. (Ibid.), viii.

[18] Garbage transfer stations are developed as part of strong secondary collection infrastructure and not only make waste collection more efficient but can also be the site of basic upgrades to waste sorting, by, for example, installing conveyer belts to more efficiently segregate recyclable materials.

[19] Herman Huisman, Hans Breukelman, and Bert Keesman, Myanmar Waste Scoping Mission Report (Netherlands Enterprise Agency, 2017).

[20] Taunggyi, Muse, Lashio, Nyaung Shwe, Aye Thar Yar, Gine Thoke, and Tachileik in Shan State, and Monywa and Pyin-Oo-Lwin in Sagaing Region and Mandalay Region (respectively).

[21] Asian Development Bank, Integrated Solid Waste Management for Local Governments: A Practical Guide (ADB 2017a).

[22] Astrid Haas and Paul Collier, Financing Fast-Growing Cities (IGC: Growth Brief, 2017).

[23] Source: The Asia Foundation (2019).

[24] The only exception to this, according to the author's knowledge, is Mandalay, where the Mandalay City Development Committee (MCDC) has a secondary collection network with proper transfer stations, although it is not explicitly referred to as such.

[25] According to a recent report by the Renaissance Institute, in fiscal year 2016 – 2017 Union government transfers accounted for an average of 69 percent of sub-national government revenues or around MMK 50,000 per capita (see Valley and Kyaw, ibid.).

[26] Source: Dr. Thit San, Mandalay Municipal Horizontal Learning Workshop 2018, organized by The Asia Foundation and the Renaissance Institute.

[27] Some DAOs have supplementary income streams from special collection orders of solid waste (usually MMK 10,000 or 15,000 per truck load) or septic tank pumping (which in e.g. Taunggyi costs between MMK 30,000 and 50,000).

[28] This is perhaps not surprising given the generally poor capacity of the private sector in small and mid-sized towns in Myanmar, where there is only likely to be one (if any) local firm able to take on a relatively ambitious public service contract. However, open and transparent tendering procedures are vital for creating accountability, public scrutiny, and – in the long run – increased competition amongst potential contractors.

[29] Interview with Deputy Staff Officer (DSO) of Taunggyi DAO, on 7 July 2018.

[30] 70 percent was the estimate provided by the DSO while the private contractor estimated 75 percent.

[31] At the time of writing, a new company had been contracted to collect waste in Aye Thar Yar while Shwe Nyang is in the process of outsourcing.

[32] In two separate clauses the contract also mentions that "the service provider must comply with particular regulations for garbage collection services" and that "the service provider must deliver services that must satisfy local residents," although no specific details or standards are prescribed.

[33] MIT, Solid Waste (Environmental Strategies for Cities, n.d.).
[34] ADB (ibid.), 3.
[35] Herman Huisman, Hans Breukelman, and Bert Keesman, Myanmar Waste Scoping Mission Report (Netherlands Enterprise Agency, 2017), 36.
[36] Interview with DAO Deputy Director.
[37] Overall, 46 percent of respondents expressed satisfaction (agreed or strongly agreed) while 32 percent expressed dissatisfaction (disagreed or strongly disagreed).
[38] Most ward administrators in Myanmar are appointed officials, although some wards have begun experimenting with local elections.
[39] According to the DAO administrative staff, this official figure is slightly outdated, most likely based on the 2014 census. The DAO has about 50,000 registered for property tax purposes (Source: author interviews).
[40] This took place under a previous administration and none of the DAO managers interviewed worked there at the time, hence the lack of detailed information about the contract.
[41] These are Phone Soe, Tharlar, and Chanmyawaddy wards.
[42] In Aung Mingalar, local leaders collected MMK 500 from each household which went into a community fund that covered about half the MMK 600,000 it cost to run the scheme each month (including two laborers). The DAO subsidized the deficit with 16 gallons of fuel. Aung Mingalar, however, only ran this model for a couple of months in 2013 before the DAO's cleansing department expanded coverage and took over waste collection.
[43] 7.5 percent of the property tax goes to waste collection. Businesses are charged between MMK 5,000 and 10,000 a month for garbage collection, but cleansing department officials estimate that only 40 percent of businesses actually pay a fee.
[44] Lack of local government accountability can create a vicious cycle. Trust is required to improve tax and fee collection, without which DAOs are unable to improve service delivery. In turn, inadequate service delivery is likely to undermine public trust.
[45] Brooks Anderson, Privatisation: A Formula for Provision or Perversion of Municipal Solid Waste? (Clear Impression Documentation Services, 2011).
[46] Ibid.
[47] News 18, Review of outsourcing of solid waste management (News18.com, 2011)
[48] Anderson (Ibid.)
[49] Deccan Herald, Residents protest reopening of Mavallipura landfill site (DeccanHerald.com, 2015).
[50] CCET, Planning and Implementation of Integrated Solid Waste Management Strategies at Local Level: The Case of Surabaya City (IGES Centre Collaborating with UNEP on Environmental Technologies, 2017).
[51] Ibid.
[52] UCLG, Surabaya, Indonesia: Clean and Green Initiative (United Cities and Local Governments, 2010).
[53] Small-scale community compost centers can cost as little as a few hundred dollars. They can be cross-subsidized by a combination of municipal authorities, NGOs and private sector actors. Alternatively, the municipal government can invest in regional compost centers in strategic sites where organic waste and manure can be collected through informal waste-picking networks.

[54] UCLG (Ibid.).
[55] In a natural monopoly, barriers to entry such as high capital costs make it inefficient to have multiple contractors (including the municipal government) supplying a single area. In advanced economies which use expensive equipment, this means that large areas – typically an entire city – need to be outsourced in one go for the contractor to be able to achieve economies of scale.
[56] See for example John Morton, Time to rethink how to harness the private sector to improve sustainable solid waste management (World Bank Sustainable Cities Blog, 2017).
[57] Emanuele Lobina and Dave Hall, Thinking Inside The Box: Why The World Bank is Not Learning (Public Services International Research Unit, University of Greenwich, 2009).
[58] Rooks Anderson, Privatisation: a formula for provision or perversion of municipal solid waste management (Clear Impression Documentation Services, 2011).
[59] Paul H. Jensen and Robin E. Stonecash, Incentives and the efficiency of public sector outsourcing contracts (Journal of economic Surveys, 2005), 768.
[60] Ibid.: 769.
[61] Emanuel S. Savas, Privatization and Public-Private Partnerships (2000), 7.
[62] OECD, Waste Management Services (Policy Roundtables, 2013), 5–6.
[63] However, even if one centralized entity (whether public or private) takes care of all household waste collection in a given area, smaller companies can still be sub-contracted to take care of specialized waste management such as industrial or toxic waste, or the separation and sale of recyclable materials.
[64] Known as diseconomies of scale.
[65] See ASEAN Briefing (Rastogi 2018).
[66] Klemen Kavčič and Mitja Tavčar, Planning Successful Partnership in the Process of Outsourcing (Kybernetes, 2008), 241–249.
[67] Laura Poppo and Todd Zenger, Testing alternative theories of the firm: transaction cost, knowledge-based, and measurement explanations for make or buy decisions in information services (Strategic Management Journal, 1998), 853–877.
[68] Anurag Sharma, Professional as agent: Knowledge asymmetry in agency exchange (Academy of Management Review, 1997), 758–798.
[69] Mary S. Logan, Using agency theory to design successful outsourcing relationships (The International Journal of Logistics Management, 2000), 21–32.
[70] Anurag Sharma (Ibid.).
[71] Anurag Sharma (Ibid.), 785.
[72] In theory, this principle applies regardless of whether the contractor or the municipality take ownership of the vehicles after the end of the contract. If the contractor purchases its own assets, the fact that the contractor can sell them at the end of the contract duration can be used as a bargaining chip by municipal authorities to get a lower service cost.
[73] Benoit A. Aubert, Suzanne Rivard, and Michel Patry, A Transaction Cost Model of IT Outsourcing (Information & Management, 2004), 922.
[74] Klein, Crawford and Alchian (1978) and Williamson (1985), cited in Laura Poppo and Todd Zenger, Testing alternative theories of the firm: transaction cost, knowledge based, and measurement explanations for make-or-buy decisions in information services (Strategic Management Journal, 1998), 19.
[75] Popp and Zenger (Ibid.).
[76] Elliott Sclar, You Don't Always Get What You Pay For: The Economics of Privatization (Cornell University Press, 2000).
[77] Asian Development Bank, Integrated Solid Waste Plan – Mandalay (prepared by AECOM, 2016), 116.
[78] Ibid.
[79] Jensen and Stonecash (Ibid.),777.
[80] See for example Jensen and Stonecash (ibid.).
[81] E.g. Shafiul Azam Ahmed and Mansoor Ali, Partnerships for Solid Waste Management in Developing Countries: Linking Theories to Realities (Habitat International, 2004), 467–479.

[82] Jensen and Stonecash (ibid.), 777–78.
[83] Mary S. Logan (Ibid.), 25.
[84] Oliver Hart, Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships (The Economic Journal, 2003), C69–C76.
[85] See for example Golooba-Mutebi, Devolution and Outsourcing of Municipal Services in Kampala City, Uganda: An Early Assessment (Public Administration and Development, 2003), 405–418.
[86] Cointreau-Levine (2000: 26), cited in Rooks Anderson (ibid.), 13.
[87] See for example Cheryl W. Gray, Reforming Legal Systems in Developing and Transition Countries (Finance and Development, 1997), 14–16.
[88] By which well-functioning refers to independence, impartiality, and the possession of technical/financial capacity to enforce the law.
[89] Nikos Passas, Corruption in the Procurement Process/Outsourcing Government Functions: Issues, Case Studies, Implications (Institute for Fraud Prevention, 2007).
[90] Mesharch W. Katusiimeh, Arthur P. J. Mol, and Kees Burger, The Operations and Effectiveness of Public and Private Provision of Solid Waste Collection Services in Kampala (Habitat International, 2012), 247–252.
[91] Olver Hart, Andrei Shleifer, and Robert Vishny, The Proper Scope of Government: Theory and an Application to Prisons (The Quarterly Journal of Economics, 1997), 1127–1161.
[92] Bengt Holmstrom and Paul Milgrom, Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design (Journal of Law, Economics and Organization, 1991), 24–52.
[93] Bengt Holmstrom and Paul Milgrom, The Firm as an Incentive System (American Economic Review, 1994), 972–991.
[94] Simon Domberger and Paul Jensen, Contracting out by the public sector: theory, evidence, prospects (Oxford Review of Economic Policy, 1997), 67–78.
[95] Williamson (1976), Schmalensee (1979), and Krugman (2002), cited in Jensen and Stonecash (ibid.), 776–777.
[96] Jensen and Stonecash (ibid.), 773–775.
[97] John Quiggin, Contracting Out: Promise and Performance (Economic and Labour Relations Review, 2002), 88–204.
[98] Janet Rothenberg Pack, Privatization and Cost Reduction (Policy Sciences, 1989), 1–25.
[99] John Quiggin, The Fiscal Gains From Contracting Out: Transfers or Efficiency Improvements (Australian Economic Review, 1994), 97–102.
[100] Janet Walsh and Janine O'Flynn, Managing Through Contracts: The Employment Effects of Compulsory Competitive Tendering in Australian Local Government (Industrial Relations Journal, 2000), 454–470.
[101] Nandini Gooptu, Servile Sentinels of the City: Private Security Guards, Organized Informality, and Labour in Interactive Services in Globalized India (International Review of Social History, 2013), 9–38.
[102] See for example Stephen Cope, Contracting-Out in Local Government: Cutting by Privatising (Public Policy and Administration, 1995), 29–44.
[103] David Fairris and Mark Brenner, Workplace Transformation and the Rise in Cumulative Trauma Disorders: Is There a Connection? (Journal of Labor Research, 2001), 15–28.
[104] Jensen and Stonecash (ibid.), 781.
[105] Ernst Fehr and Armin Falk, Psychological Foundations of Incentives (European Economic Review, 2002), 687–724.
[106] Patrick Francois, 'Public Service Motivation' as an Argument for Government Provision (Journal of Public Economics, 2000), 275–299.
[107] Ibid.
[108] Daron Acemoglu, Michael Kremer, and Atif Mian, Incentives in markets, firms, and governments (The National (Bureau of Economic Research, 2004), working paper 9802.
[109] Efficiency savings are here taken to refer to cost reductions that can achieved from better organization of operations, communications, human resources, partnerships, and other innovations. In turn, this can – in theory – allow a firm to increase its output (i.e. collect waste from more house-

holds).
[110] Domberger and Jensen (ibid., 1997).
[111] Simon Domberger, Paul H. Jensen and Robin E. Stonecash, Examining the Magnitude and Sources of Cost Savings Associated With Outsourcing (Public Performance & Management Review, 2002), 148–168.
[112] E. Dijkgraaf and R. Gradus, Cost Savings of Contracting Out Refuse Collection (Empirica, 2003), [149]–161.
[113] Irish Competition Authority 2006, cited in OECD (ibid.), 22.
[114] Germà Bel and Mildred Warner, Does Privatization of Solid Waste and Water Services Reduce Costs? A Review of Empirical Studies (Resources, Conservation and Recycling, 2008), 1337–1348.
[115] See also Beata M. Merickova, Juraj Nemec, and Jana Soukopova, The Economics of Waste Management: Evidence from the Czech Republic and Slovakia Lex Localis - Journal of Local Self-Government, 2014).
[116] Asian Development Bank (ibid).
[117] Paul Starr, The Limits of Privatization (Economic Policy Institute, 1987), 6–7.
[118] Jensen and Stonecash (ibid.), 770.
[119] In a natural monopoly, barriers to entry such as high capital costs make it inefficient to have multiple contractors (including the municipal government) supplying a single area. In advanced economies which use expensive equipment, this means that large areas – typically an entire city – need to be outsourced in one go for the contractor to be able to achieve economies of scale.

The Asia Foundation

No. 11, Ko Min Ko Chin Yeik Thar Street
West Ngar Htet Kyi Ward, Bahan Township, Yangon, Myanmar

www.asiafoundation.org