A public service or a common good? The shifting boundaries of solid waste management in global South countries

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Abstract

For several decades, the public service for managing solid household and similar wastes has seemingly sported a clear-cut public health objective of offering an identical service across a given territory. Yet, empirical research conducted over recent years in global South countries shows that the perimeter of this public service is changing with respect to global environmental issues, multiple governance and social implications, as well as increasingly challenging technical and economic issues. These developments never equate to a firmly stated political project but are often veiled behind new recycling needs, a lack of public financing or the intervention of private players, informal actors or citizens. Yet, this implicit redefinition of the boundaries of what is seen as a "public service" has been reshuffling the cards the political game of waste. The idea of the public actors' role is shifting, whether the goal be to include informal wastepickers, reduce poverty or preserve resources. Although other forms of this phenomenon are visible in global North cities, this paper focuses specifically on cities in the global South.[1]

The six case studies (Lima, Bogotá, Lomé, Antananarivo, Delhi and Surabaya) offer a shifting picture of the boundaries of this public service. Sometimes, the perimeter of the service is reduced at the margins when recyclable and compostable wastes are removed ahead of municipal collection. In other cases, the service may be reduced upstream when a (more or less formal) primary collection scheme is set up. Some of the tasks are assigned to third-party actors, rather than simply privatising the service. Indeed, this does not call on either a market-economy rationale or an institutional logic. The notion of commons can then by introduced to analyse an increasingly composite form of solid waste management.

Since the 19th century, a public service for managing solid household and similar wastes seems to have had a clear-cut public health objective aimed at providing an identical service across a given territory (Coutard & Rutherford, 2016; Berdier & Deleuil, 2010). Yet, empirical research conducted in global South countries over the past few years (Jaglin *et al.*, 2018; Durand *et al.*, 2019) shows that the scope of this service is changing with respect to

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global environmental issues, governance and numerous social implications, as well as increasingly challenging technical and economic issues. These developments never correspond to a firmly stated political project, but are often veiled behind new recycling needs (Le Bris & Coutard, 2008), a lack of public financing or the intervention of private players (Luthra, 2019), informal actors (Scheinberg & Anschutz, 2016; Cirelli & Florin, 2016) or citizens (Salvaire, 2019). Nevertheless, this implicit redefinition of the boundaries of what is viewed as a "public service" has been reshuffling the cards of the political game of waste. The idea of the public actors' role is shifting, whether the goal be to integrate informal wastepickers, reduce poverty or preserve resources. Although other forms of this phenomenon are visible in global North cities, this paper focuses specifically on cities in the global South.[2]

This paper re-examines the notion of a public waste management service and the role of local policymakers. Drawing on the study of six global South cities, it analyses locally deployed organisational innovations designed to integrate activities previously seen as being outside of the municipal service, or even illegal, marginal or reprehensible. The first section explores the notion of "public service" through a historical prism, gradually focusing in on global South countries. The second section presents the methodology of the approach and the fields of study, while the third section describes the results of the innovations implemented by each city. Comparing our theoretical thinking with the field observations, in the fourth section we take a look at the relations that develop between the public waste management service, the municipal action and the activities that fall into the domain of the commons.

1. The notion of public service under debate

Since the 1990s, a great deal of research has been done on how networked urban services (water, sanitation, electricity, waste, etc.) are structured, mainly in view of analysing the interactions between public- and private-sector actions. Since then, the trends observed have continued to evolve, while also becoming more complex. We begin our literature review with the global North countries, which were the first fields of research, then go on to explore how the so-called "global South" countries have appropriated this notion of public service.

1.1. The incremental construction of the "public" service model of urban networks

Although global South countries are the focus of our research, the conception of public services that they applied at the end of the 20th century was forged by the industrialised countries of the late 19th century. Understanding this history is thus key aspect for analysing the difficulties of formalising the indigenous models of global South countries. In 19th-century Europe and North America, cities were gradually equipped to supply their residents with water and energy and remove the mounting volumes of solid and liquid wastes. The public service was first organised to supply water and power, and then replicated in the area of waste. From the 19th century until the end of the 20th century, the perception of these urban services developed in three main phases.

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[2] Building mainly on the results of the ORVA2D research project, led by Le Mans University and funded by AFD between 2014 and 2018.

The first phase (***1. The predominance of concessions***) developed in the second half of the 19th century with the urbanisation and industrialisation of West European and North American societies. Municipalities granted concessions to private companies, sometimes for very long stretches (99 years), to build networks and supply populations with water and power. This system helped to launch the first initiatives but proved to be only partly effective as in the early 20th century only 1% of France's (wealthiest) population had access to a water supply (Pezon, 2009). At the time, the notion of public service did not exist. As far as waste was concerned, the first street-cleaning concessions were also awarded to companies (Cavé, 2015b) serving the cities' most affluent neighbourhoods to tackle the "age of stenches" (Melosi, 2000) and meet basic health needs (Barraqué, 2014). In these years, recycling was totally out of the question, being reserved for the last of the rag-pickers, whose activities were deemed illegal.

In the wake of World War II,[3] economic recovery, a stronger desire for social equality, and spreading urbanisation created the need for massive intervention by public actors to extend access to networked urban services. As a result, municipalities were gradually assigned the legal responsibility for these urban services, whereas previously they had assumed this indirectly. For example, before the 1975 law in France, cities managed their waste in the name of public health and not waste collection as such. The second phase coincides with the "invention of urban waste" (Barles, 2005) and the gradual establishment of a public service for solid waste collection and removal. Following the needs expressed by the now more powerful municipalities, governments invested massively, thus enabling municipalities to extend access to all urban networks. During this second phase (***2. Direct management with national funding***), urban services became quite literally "public" (Pezon, 2009), meaning that they acquired a universal mission and were directly implemented by public actors.

In the 1980s, the third phase (***3. Affermage[4] and delegation***) ushered in a hybrid version of the two first models, creating a public service that can be partly delegated to private sector actors. This is the invention of affermage contracts, public service delegation and service provision, dubbed the "French model" (Lorrain, 2008). Private businesses came back into play, this time under stricter control of public actors. The authorities were facing stronger budget constraints and seeking to bring their budgets back into balance. The idea that the private sector was more economically efficient gained traction (Lorrain, 2008), even though re-municipalisation was a regular occurrence. Although the definition of partnership arrangements between public and private bodies (Petijean, 2009) were subject to very heated debates, this model now seems to have found a certain balance between a public service either directly managed by public actors or delegated to the private sector, with variations depending on the territories and services involved. The major challenge remains the municipalities' capacity to control and manage the implementation of these urban services, which are becoming more complex with the reintroduction of recycling.

These three phases of networked urban services developed mainly around the water supply service in global North countries, with waste management services being introduced only in the 1970s. Yet, the way in which waste is managed has been wholly based on these models. Spurred by international financial bodies, global South countries initially opted to

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[3] In fact, at the end of the 19th century for water networks.
[4] See https://ppp.worldbank.org/public-private-partnership/agreements/leases-and-affermage-contracts

replicate the third phase of affermage and delegation in order to balance public budgets and encourage private-sector participation.

1.2. In the 21st century, global South countries are taking new directions

In the third phase mentioned above, management approaches rely on centralised and capital-intensive schemes (Medina, 2005) that follow a top-down logic (Baud & Post, 2004) and are justified by the idea that waste treatment can benefit from economies of scale (Bartone, 1995). In this phase, private actors were viewed as having greater technological expertise than public administrations (Cointreau-Levine, 1994). This view still prevails in the 20th century in global South countries. The reconfiguration of the public service has thus hailed as a "modernisation" (UN-Habitat, 2010; Jaglin et *al.*, 2018). In the area of waste, this modernisation typically involves replacing dumpsites with controlled sanitary landfills as a final sink. In other words, what structures the whole management chain is no longer the collection of waste but the downstream process (controlled landfill), which can impact the choices of upstream waste management.

Even so, on the fringes of official management schemes, alternative methods have persisted, such as waste recovery and recycling by informal actors. When these informals are paid on a pro-rata basis for the tonnage they collect, they often compete with formal private operators: "The process of modernisation often creates competition between formal authorities and informal enterprises for materials" (Scheinberg, Simpson, Gupt et al., 2010, p. 8). In fact, informal recovery actors practice "skimming" (Bertolini, Foully, & Morvan, 1999), meaning that they extract the most lucrative items from the waste, leaving behind a waste stream for the most part depleted of its more easily recoverable materials. Gradually, their intervention increased and, as of 2010, several reports confirm the existence of conflicts: in addition to the emblematic case of "*contested*" waste in Cairo (Fahmi & Sutton, 2010; Florin, 2010), other "*hidden'* (Coffey & Coad, 2010, p. 127) or "*potential*" (Gerdes & Gunsilius, 2010, p. 25) conflicts emerged.

This context prompted wastepickers (informal waste recovery actors) to organise themselves internationally in the mid-2000s. Despite an evident lack of resources, the South-American wastepickers initiated this momentum based on the principle that because "just like the exploiters have overcome transnational borders, we wastepickers too won't have borders in our struggle".[5] The wastepickers received support from numerous local and international civil society organisations.[6] This mobilisation came to a head in 2008 with the first world wastepickers' conference held in Bogotá, Colombia. Today, national wastepickers' alliances are found in many countries (13 Latin American countries, Kenya, South Africa, India, etc.) and the movement's representatives attend a numerous international conference to defend their rights.

Little by little, the way that wastepickers were perceived has changed. During the 2000s, a consensus emerged advocating the integration of wastepickers into the restructuring of the waste management sector (Bernstein, 2004; Forsyth, 2005; Wilson et al., 2006; Scheinberg & Anschütz, 2006; Gupta, 2012). Certainly, it seemed absurd to exclude informal

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[5] http://globalrec.org
[6] Mainly from the Avina Foundation, the Association France Libertés, the network Women in Informal Employment, Globalizing and Organizing (WIEGO), the Participatory Sustainable Waste Management programme and the NGO Global Alliance for Incinerator Alternatives (GAIA).

recovery actors particularly in situations where the municipal system operated only one landfill and no form of waste treatment: "It would seem ironic to move forward by deliberately eliminating what can be a rather efficient existing recycling system" (Wilson et al., 2006, p. 798). Wastepickers thus gradually come to be described as economic agents (Scheinberg & Anschütz, 2006), waste management professionals or even global "cooling agents" by the Delhi-based NGO, Chintan (Chintan,[7] 2009). The integration of wastepickers was presented as offering three kinds of advantages (Gerdes, Gunsilius, 2010) with labour conditions often being the starting point: formalisation helps to improve their work conditions and ensure their inclusion and social protection; environmentally speaking, wastepickers achieve high recycling rates given their specific practical know-how and clearly because their livelihood depends on it; and lastly, at the economic level, the sector creates jobs and boosts a country's industrial activity.

The year 2010 saw the publication of three institutional reports (by UN-HABITAT, GTZ and GIZ-CWG) that made salient contributions to the thinking on how municipal waste management services in global South cities should be reconfigured. They show, for instance, that informal recyclers divert between 15 and 20% (in weight) of the cities' recyclable waste, which allows the municipal authorities to make a 15 to 20% savings on their waste management budget (Waste & Skat, 2010). This gradual recognition of the activities of informal recovery actors has helped to challenge the conventional idea of a public waste management service in global South countries, which in turn challenges the notion of public service as practised in former years. This first opening-up has made way for other practical initiatives supported by local actors.

2. Comparative research on six cities in global South countries

2.1. Policymakers' diverging appropriations of the "waste" question as a criterion for selecting the areas of study

Our line of thinking centred on the development of the public waste management service, taking into consideration both the related socio-environmental crises and the fiscal constraints involved. The objective was to study how social innovations are integrated into municipal waste management systems. The cities of Lima and Bogotá (Latin America), Lomé and Antananarivo (Africa) and Delhi and Surabaya (Asia) were selected as case studies as they encompass practices that range from a mimetic replication of the model for the public waste management service found in global North countries and the integration of spontaneous practices that are sometimes informal and illegal. Each city in its own way provides insights into how the public service is developing and how policymakers are implicitly appropriating the different models. The choice of case studies also took care to ensure that the cities were representative of the three so-called "global South" continents, and included agglomerations with varying population sizes (Figure 1) and social economic characteristics, as this leads to differences in their dedicated waste management budgets.

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[7] http://www.chintan-india.org/
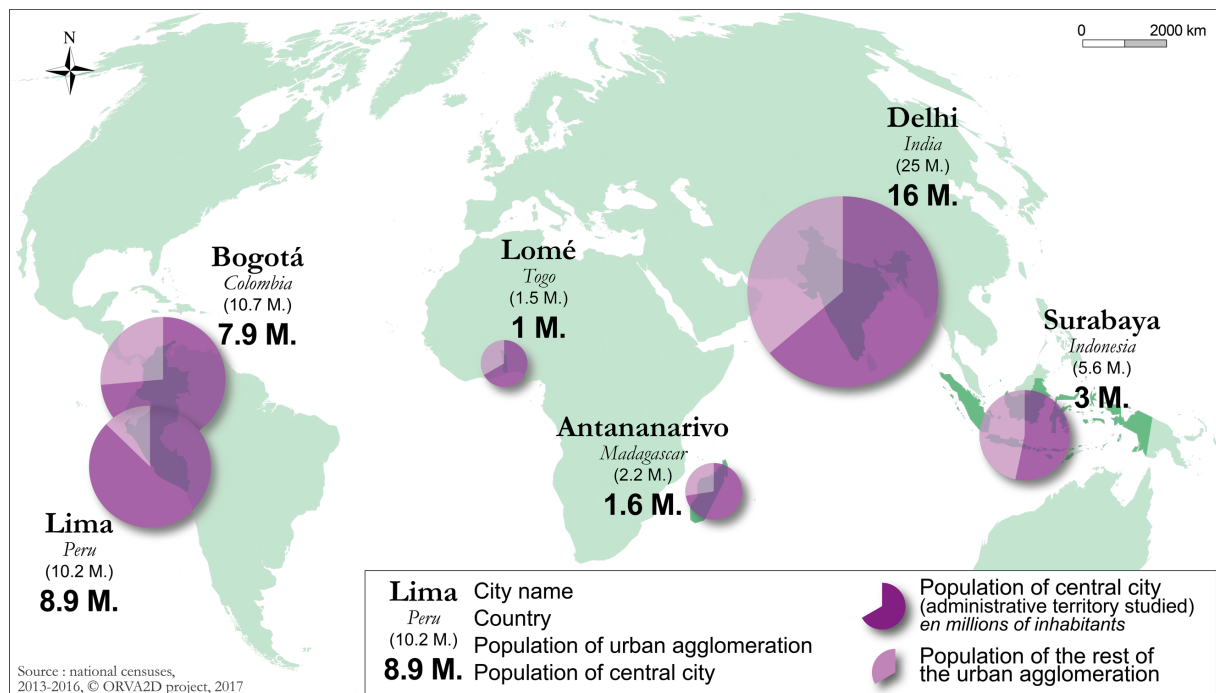
Figure 1.   Population of the reference cities (circa 2015)[8]

The methodological work involved developing a quantitative survey grid that was identical for each city with respect to waste streams, infrastructure, costs and the actors involved. These elements enabled us to apply a comparative approach (despite all the uncertainties and incompleteness of the data) and thus understand the real budgetary and logistical situations of the cities' waste management. These data were supplemented by interviews with the stakeholder operating in the fields under study and enabled us to use a qualitative vision to compensate for the absence of data and understand each actor's view of the public waste management service on its territory.[9] This paper focuses on the political aspect of waste management and on the ways in which socio-organisational innovations are integrated into municipal management. It aims to understand how changes in the perimeter of the public service in each city reflect a changing social and political conception of waste.

2.2. Multiple realities in global South countries

Although the reference cites may exhibit similar logics insofar as they challenge the mimetic model and seek to adapt to local specificities, the demographic, urban and rudological[10] reality of each city differs substantially.

Across all of the cities, the rate of household solid waste collected by the municipality (or its service provider) is satisfactory (over 70%) compared to what was the case only ten years previously (Figure 2). In the less cash-strapped cities, these rates hover around 90% (Surabaya, Bogotá, Comas, Delhi) and even reach 100% for the wealthiest neighbourhoods such as Surco (Lima). Only Antananarivo has a lower collection rate of 55%. This can be

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[8] As each city had very patchy data, the sources available cover the years 2013, 2014, 2015 or 2016.
[9] For more details on the methodology, see Durand et *al.*, 2019.
[10] Science of the systemic study of waste.

explained mainly by the city's primary collection and decentralised waste recovery methods, which result in much of the waste streams disappearing from the municipality's radars.

The quantity of waste generated per capita is also highly variable from one city to another and is directly correlated to the local standard of living. Whereas the Latin American cities, which have a higher level of development, produce 1 kg of household waste per capita per year, Antananarivo in Madagascar has a much lower rate of 0.4 kg. By way of comparison, the cities of Paris and Berlin reach 1.3 and 1.2kg per capita per year.[11]
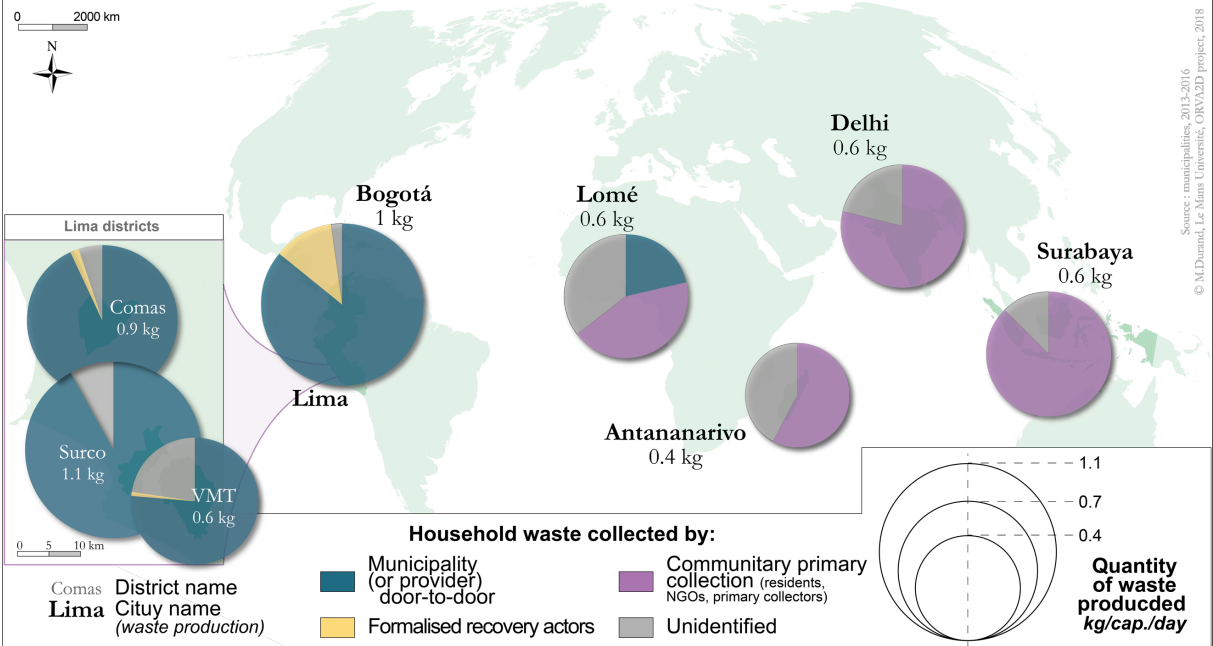


*VMT = district of Villa María del Triunfo

Figure 2.   Production and collection of household and similar wastes (circa 2015)

The financial resources available to each city for waste management vary greatly, generally in proportion to each territory's level of wealth (Figure 3). Bogotá is far ahead of the other cities with €19.68 per capita per year. Although Surco comes close to this budget, it should be noted that this district is the wealthiest in the city of Lima and not representative of the city as a whole. On the contrary, Lima's low-income districts, Comas and Villa Maria del Triunfo (VMT), highlight very marked intra-city inequalities as their budgets are equivalent to those of the other African or Asian cities. Antananarivo alone has an excessively low budget not only due to economic weaknesses but also because the municipality finds it difficult to exert political control over the territory.

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[11] Eurostat, 2016.
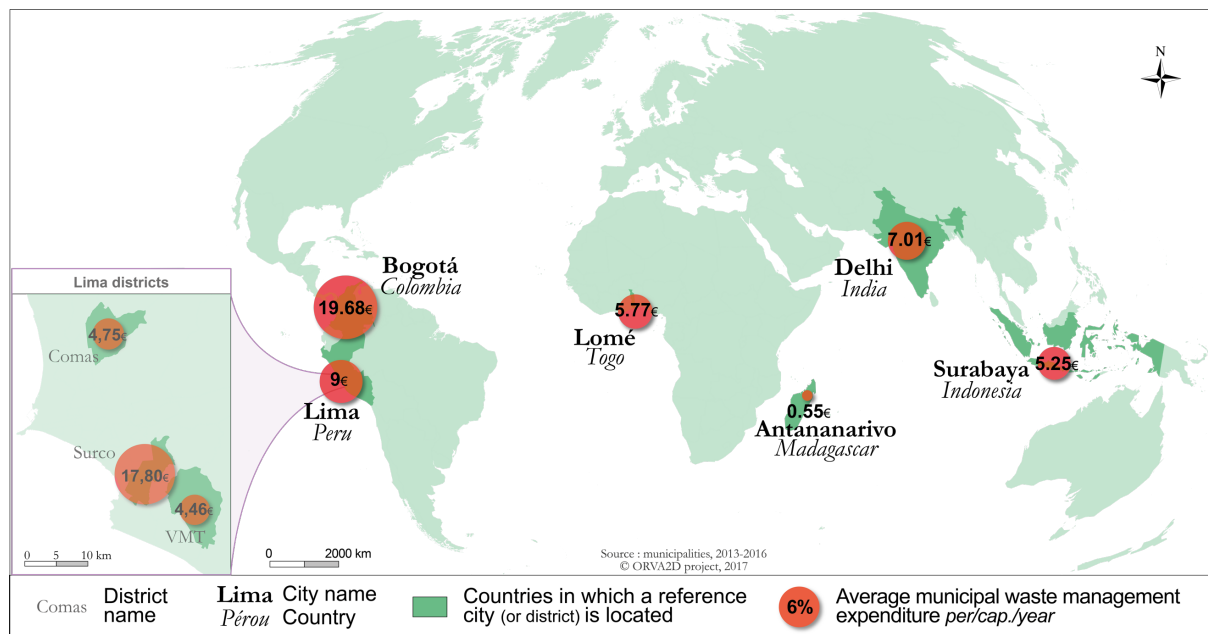
Figure 3.   Waste management expenditure varies widely across cities (circa 2015)

The characteristics of the cities outlined above give rise to public waste management services that differ substantially from one territory to another and illustrate distinct municipal policy strategies.

3. Global South cities invent new waste governance models

3.1. *Reducing municipal action upstream: primary collection in Africa and Asia*

To supplement the municipal service, some cities are trying to organise a longstanding informal practice: primary collection. Most of the cities are unable to offer their inhabitants a door-to-door service and, instead, limit their waste collection to pick-up along the main roads. As a result, primary collection emerges spontaneously in order to reach households. This is ensured either by the householders themselves, or entrusted to other neighbourhood residents, micro-enterprises or local residents' associations in exchange for a small fee.

Despite the legal obligation to service the whole agglomeration, only 10 to 15% of the neighbourhoods in Delhi city centre (*New Delhi Municipal Corporation*) had door-to-door collection in 2017.[12] Elsewhere in the city, informal primary collection is a vital complement to the municipal service, for a monthly cost to each household of €1–2 paid directly to the primary collectors. *Dhalaos* (transfer points for the primary collectors) are now managed by the municipalities so as to ensure the cleanliness of public spaces. Even so, this practice remains illegal and the collectors sometimes have their equipment confiscated.

In Surabaya (Indonesia), primary collection is highly organised, but also not officially authorised. It is carried out by large-scale neighbourhood associations (*Rukun Warga* or RW), which collect the waste using handcarts and transport it to transfer points, known as

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[12] Field survey carried out under the ORVA2D project by Rémi De Bercegol, 2016.

Temporary Shelter Facilities (TPSs).[13] The primary collectors (*tenanga penambil)* are paid by the RWs at rates that vary from one neighbourhood to another. Based on strong local solidarity and sociability, this system has received several international awards for its achievements. Collecting the primary collection service charge is relatively easy given that a relationship of trust exists between the collectors and the residents. On the other hand, it is often impossible to collect the taxes at city level given the inhabitants' mistrust of the municipal institution. Other cities have tried to introduce tighter management of this primary collection system.

Photo 1.   *Primary collectors (tenanga penambil) in Surabaya © Cavé, ORVA2D, 2016*

The primary collection service in Antananarivo has been integrated into the municipal service through the setting-up of transfer points in each neighbourhood (*fonkontany*).[14] Primary collection was officially authorised by a municipal decree in 2006, based on the RF2[15] scheme, which operates on the principle of assigning unemployed residents in each neighbourhood to the primary collection service. Households pay between €0.15 and €0.60 directly to the primary collector. Although this system officially operates in at least 145 of the city's 192 fonkontany, its efficiency varies across neighbourhoods, depending on the support from foreign NGOs.

The northern periphery of the city of Lomé (650,000 poor inhabitants representing two-thirds of the city's population) operates a primary waste collection scheme. In 2015, the municipality divided the territory into 25 lots,[16] each of which was assigned to a micro-enterprise following a competitive bidding process. The users pay a fee directly to the primary collectors, ranging from €2 to €4 per household per month. In principle, a small share of this

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[13] Field survey carried out under the ORVA2D project by Jérémie Cavé, 2016.

[14] Field survey carried out under the ORVA2D project by Clémence Lecointre, Romain Breselec and Adeline Pierrat, 2015.

[15] "*Rafitna Fikajana ny Rano sy ny Fakadiovana"* translates literally as "cleanliness and hygiene of my neighbourhood".

[16] Field survey carried out under the ORVA2D project by Julien Garnier, 2016.

amount (2–12% depending on the case) is paid to the municipality to finance collection from the transfer points, but in reality, the municipality struggles to recover these funds.

Linking primary waste collection with municipal waste management thus allows for the extension of the public service action without extending that of the municipal service. This development incurs a lesser cost as it only involves providing non-financial support to primary collection operators. As a result, public policies are able to take advantage of the trust between citizens and primary collectors, which in practical terms makes it possible to circumvent the distrust towards the municipal authorities.

3.2. Contracting out downstream services: reliance on informal recovery actors in Latin America and Indonesia

Waste recycling itself is rarely a profitable business (except for materials such as metals). Europe has chosen to impose a financial contribution on the companies producing goods and on the consumers who buy them to ensure that the waste management model is economically balanced (EPR[17] chains). Some global South countries are attempting to instead rely on informal recovery agents to complement the public service at a lesser cost. In fact, this informal activity remains "profitable" given the poor work conditions and pay.

In Peru, the Recyclers Law (2009)[18] established a national framework for wastepickers' activities, to be implemented by the district municipalities.[19] A municipality is responsible for identifying and registering the wastepickers, then organising their assignments (mainly spatial) in line with its source-segregation and selective collection programme or PSF-RS (*Programa de Segregación en la Fuente y Recolección Selectiva*). To this end, the municipalities receive subsidies from the government. The level of integration of the wastepickers varies from one district to another and the process is being applied gradually, since in Lima 90% of recovery and recycling is still done informally, with over 8,554 tonnes recovered monthly.[20]

Generally, the municipalities provide equipment (gloves, jackets, tricycles, and even premises) for the wastepickers, who are then required to comply with the constraints set by the public authority (sector, route, schedule). This equipment also plays a key role inasmuch as it enables the wastepickers to be identified by the residents and socially accepted. As a result, an illegal activity often perceived as dirty (even dangerous) is transformed into a formalised activity that delivers a (semi-public) service to the community, while also protecting the environment. To bolster the programme, Lima's Comas district (568,540 inhabitants) hired 17 people for awareness-raising activities and equipped the wastepickers, with support from the NGO, Alternativa. In VMT, another low-income district in south Lima (464,176 habitants), the operation officially covered 25% of the district's households in 2015. VMT municipality opted for an additional innovation to encourage residents to take part in the sorting: a 10% reduction in local taxes for participating households. In a completely optic, the wealthier districts such as Surco have set up municipal selective collection based on the European model, which introduces inequalities in waste treatment within the same city.

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[17] Extended producer responsibility.
[18] Law 29419 of 2009.
[19] Field survey carried out under the ORVA2D project by Mélanie Rateau, 2015.
[20] Data provided by the municipality of Lima, under the ORVA2D research project.

The informal recovery actors in Bogotá organised themselves into associations and took legal action against the Capital District authorities to oppose public procurement contracts for selective waste collection being awarded to private enterprises.[21] Arguing their constitutional "right to work, they successfully obtained legal standing for their cooperatives in municipal waste management. The 2003 ruling of the Constitutional Court of Colombia, reaffirmed by the courts in 2011, was finally enforced in 2012 by Mayor Gustavo Petro, who adopted a proactive policy of "zero waste" (*basura cero*). Of Bogotá's 13,771 wastepickers, 7,662 (55%) were recognised and registered by the municipality. Above all – and this was a first in Latin America – the wastepickers obtained payment for their services based on the quantity of waste collected, in return for the municipality's avoided costs. In 2014, 740 t/day of recyclable waste were weighed in authorised centres,[22] which represents 11% of the city's total waste and 80% of recycled waste (the remainder was recycled by informals). Formalised wastepickers were paid €27 per tonne, which cost the municipal authorities €7,252,753 in 2014.

In Surabaya, public policy turns a blind eye to the informal recovery sector, to the benefit of community-based waste management ensured by the residents themselves. This was the reasoning behind the creation of "waste banks" designed to encourage neighbourhood recycling. In 2016, there were 400 waste banks across the city (defined locally as "a 'social engineering tool' to involve citizens in waste-sorting"[23]) in which households can deposit their pre-sorted waste. The waste banks are managed at a community level by women's associations, which distribute the profits to the residents as they see fit and sometimes even remunerate a worker to manage the waste bank. The recyclables are sold on to informal local traders (some 50% of their total waste) or to a "parent" waste bank (*Bina Mandiri*) managed by the City of Surabaya. The city authorities provide support for the implementation and functioning of these structures, and estimate the annual turnover of each waste bank at between €20 and €330, which is equivalent to a yearly income of around €3 or €4 for each participating household. However, the vast bulk of waste in Surabaya is still recycled by informal wastepickers who capture most of the recyclable waste generated, as the waste banks capture no more than 0.62% of recyclables.

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[21] Field survey carried out under the ORVA2D project by Mélanie Rateau and Heduen Etrella Burgos, 2016.

[22] Out of 2,340,095 tonnes of municipal waste collected.

[23] ORVA2D field work.

Overall, we observe that the local authorities adopt two evolving approaches to municipal waste governance, particularly when it comes to recycling. In some cases, informal recovery actors continue to be stigmatised while so-called "community-based" management (by residents) is encouraged (Surabaya). In other cases, wastepickers have been integrated (Lima), either because local policymakers have understood that this will enable them to deliver a semi-public service at a lesser cost, or due to political mobilisation and the collective action of wastepickers' associations (Bogotá).

Here, the public service has extended its scope by incorporating the activities of informals without needing to broaden the municipal action itself. However, this is only feasible if the policymakers' positioning towards the formerly harassed street-pickers undergoes a sea change.

3.3. Ensure composting at source to limit the waste streams to be managed: high potential in global South countries

Although the recycling of dry waste (plastic, paper, metal, etc.) is often foregrounded, the fact is that over 50% of solid urban waste in global South countries is composed of organic materials (as much as 79% in Antananarivo). Organic waste recovery should therefore be a priority but its implementation is made difficult by the constraints of selective collection and transportation of putrescible waste. Among the cities studied by the ORVA2D project, only the Asian cities had experimented with composting at source. Surabaya has set up 23 composting units, which treat around 4% of organic household waste. In Delhi, many attempts have been made since 1985, with mixed results as composting generates no profits and the upstream waste streams are often of poor quality (a lack of sorting).

The most cost-effective method involves processing organic waste at source regardless of its level of profitability. Since 2005, this has been the case in Surabaya, where domestic composting is part of the city's policy to keep public spaces clean. Surabaya municipality distributed some 20,000 household composting bins which led to the recovery of 80 t/day of waste, equivalent to 6% of landfilled waste, although these results were likely overestimated.

Community composting has also been developed in Antananarivo, for example, around the RF2 primary collection scheme. Several community composting units have been created in collaboration with NGOs, like the unit set up in 2016 by the NGO Enda for 50 households in one of the city's districts. Receiving no resources from the city hall, its success basically depends on ad hoc support from external NGOs. The results thus differ greatly from one neighbourhood to another. Yet, "compared to other cities studies, such as Dakar or Addis Ababa, this type of organic waste recovery is particularly well-developed in Antananarivo" (Lecointre et *al.*, 2015). Composting is sometimes associated with micro-garden and market-gardening schemes in densely populated low-income neighbourhoods where the compost can easily and directly used for community gardens (which are numerous in Antananarivo).

Photo 4.   *Community composter at the Ambatomaity community garden in Antananarivo (50 households) © Pierrat, ORVA2D, 2015*

Composting obliges policymakers to reconsider several facts that are taken for granted in global North countries. First, waste valorisation must not focus exclusively on recycling dry waste (packaging) when the waste mainly comprises organic waste. Secondly, not all public waste management policies can be built on profitable economic models. This means that the authorities must accept that some public services will be loss-making and move towards the cross-subsidisation of different local services. Finally, the dogma whereby municipal actors should deliver a comprehensive municipal service breaks down in favour of a relationship of trust that needs to be built up with organized citizen groups or actors who are private but informal.

4. Reducing the scope of the public service to enhance its efficiency?

The previous examples have shown that in the global South countries studied, the framework for municipal action is gradually being redefined to make room for new ways of managing urban waste. As a result, the services ensured either directly by a public authority

or indirectly under its tight control are gradually being scaled back in scope to make way for other modes of organisation. This does not mean that the public authorities altogether disappear, but simply that the roles, competences and perimeters of public action are being redefined.

4.1. Redefining the public actors' fields of intervention: a solution for global South countries?

The study of the reference countries has shown how, in the poorest countries, the action of the municipality (or its service provider/delegatee) can be restricted to ensuring no more than the bare minimum (Figure 4), which basically boils down to responsibilities for public health: avoiding waste on public highways to reduce health risks for the population. In the case of emerging countries, this redefinition of municipal action is only partly developed.

This means, for example, that the removal of waste from neighbourhoods onto main roads may be outside the scope of municipal action and ensured, instead, by primary collectors paid directly by the residents. In this case, the municipal service is curtailed upstream.

A second restriction can intervene at the margins and exclude the municipal service from all the potentially profitable activities such as waste recovery, resale, recycling or composting. These are taken up by actors operating outside of the municipal contracting arrangements (informal recovery actors, primary collectors, neighbourhood organisations). In reality, given that waste recovery is rarely profitable (unless it relies on harmful working and environmental conditions), most of the reference cities are trying to support this activity either by co-financing it or by providing material assistance.

The third element that takes waste out of institutional sphere of action is the fact that community participation in waste management helps to stimulate neighbourhood sociability and create social ties. Although unprofitable, the services of primary waste collection, source separation or composting are conducive to creating ties between individuals within a given territory. This activity often provides some of a neighbourhood's poorest residents with a livelihood, based on the residents' solidarity. It is also a logistical element structuring the daily life of a neighbourhood (often managed by women, together with all the gender inequality issues that need to be tackled). The Indonesian waste banks, the Colombian cooperatives or the Malagasy composters are a few examples. The community aspect is pivotal in this approach to waste management as it enables some waste streams to be diverted upstream of the municipal service through spontaneous waste-reduction activities. Collective action is established to compensate for the shortcomings of municipal management.
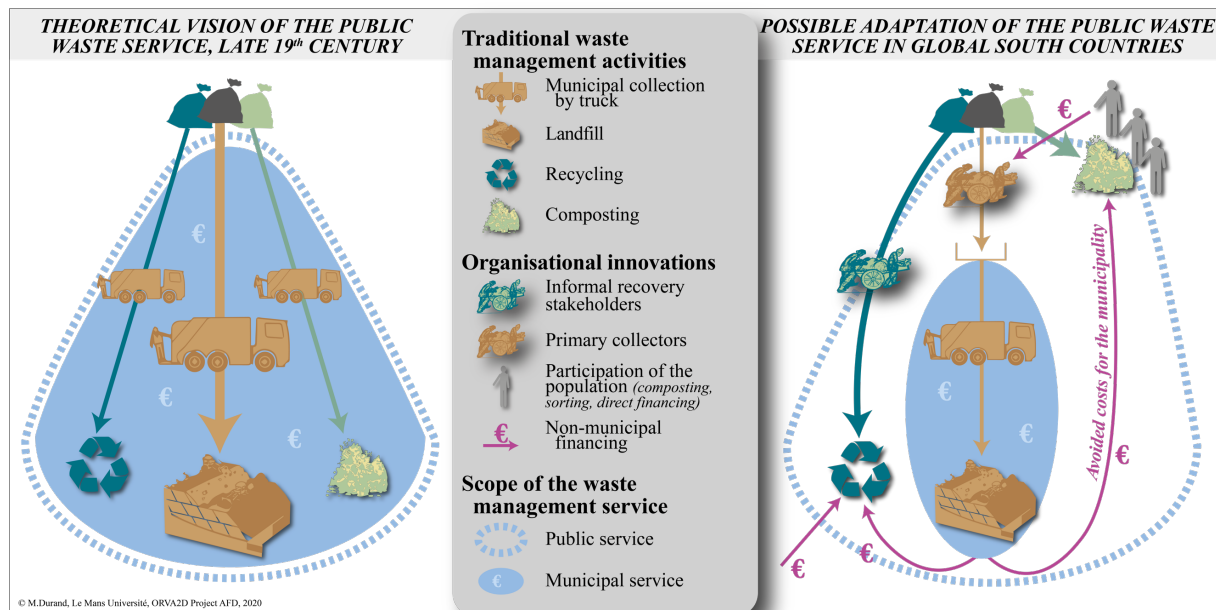
Figure 4. **An increasingly composite waste management model in the global South**

Limiting the field of municipal waste management thus relies on often precarious actors to ensure that the system functions. It creates the risk of environmental and ecological inequalities as well as heightening the vulnerability of some populations and the urban system (Durand, 2012) within a city. To avoid these pitfalls, the action of local authorities must not disappear entirely. In fact, municipalities have a key role to fulfil. They do not need to continue providing the whole of the service themselves, or even finance it (via charges and fees) or manage it (by contracting service providers). On the other hand, they need to take on a support and planning role in order to drive and coordinate stakeholders' actions. Among the reference cities, those that achieve the best results in terms of collection, recycling, cleanliness or sociability are Bogotá, Surabaya and, to a lesser extent, Lomé. In these three cities, a single institution offers a waste collection service to over 80% of the urban population and ensures coordination of all the actions. The public service is not more limited in scope, but the methods have changed radically, mixing municipal action (directly managed or via a private enterprise) and actions carried out by third-party providers.

## 4.2. From privatisation to commons: redefining the content of the public service

The previous section showed that the ambition of the municipal service has gradually been eroded on several fronts, and now stands in stark contrast with the classical representation of a public waste management service. Today, different modes of action undergird the municipal service in order to supplement it and jointly cover the entire scope of the public service. The question we then ask is what is the status of these para-municipal activities so crucial to the functioning of the public service as a whole.

The first part of this paper underlined the three historical phases that saw the conception of a public service for managing urban services develop. These three periods witnessed changes in the relations between public and private actors, evolving from

dependency to conflict and afterwards to collaboration. Today, these private actors are only one of the possible modes of action for the municipal service and do not call into question its scope. In fact, these three first phases are simply different expressions of the same model, in which the public service coincides with the municipal service and is politically unified under the umbrella of a local authority, technically centralised with primary goal of removing waste (Figure 5). The perspective is thus clearly focused on health (Barraqué, 2014) and hygiene (Deleuil & Berdier, 2010).

Yet, this whole model is now being challenged by the changing scope of municipal action. From the early 1990s, a "new philosophy of resource management is beginning to transform solid waste management" (Furedy, 1995). The shift is thus towards a logic of environmental engineering (Barraqué, 2014) and an economic model (Deleuil and Berdier, 2010) that is composite, circular and participatory (Durand et *al.*, 2019) and which brings multiple actors into play to tackle the question. Now the objective is not only to increase the valorisation of waste as a resource, but also to propose a realistic model in line with the actual availability of financial, technical and human resources on the ground. When waste management is viewed through this lens the very conception of a public service is called into question.
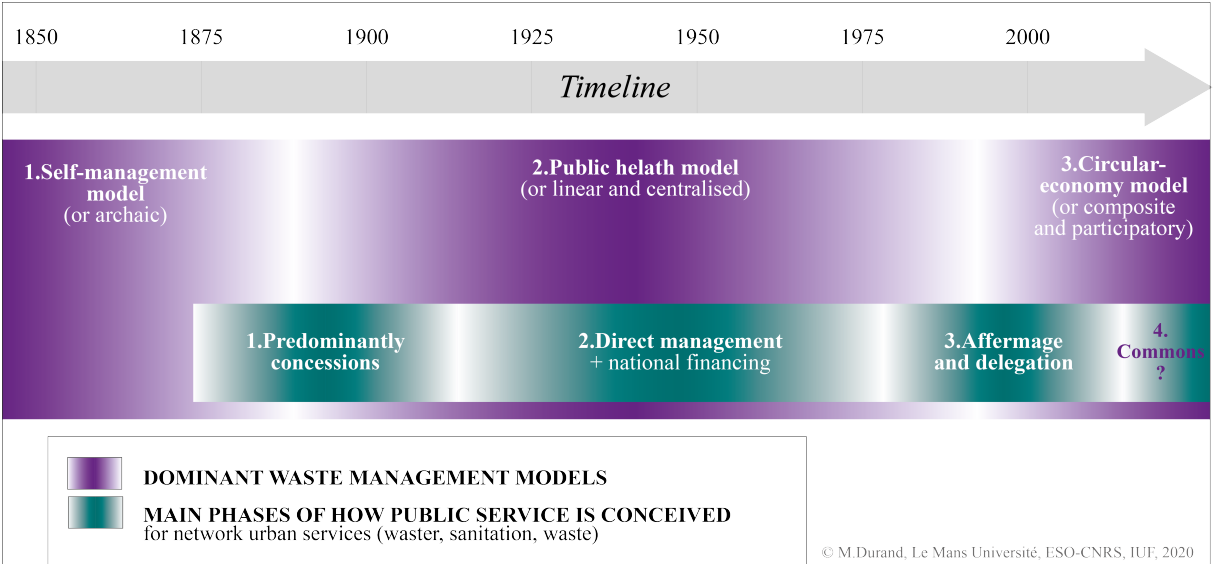
Figure 5.   Timeline of waste management models and conceptions of the public service

This is particularly the case in global South countries. After disregarding local contexts and seeking to copy the modalities of urban services management in global North countries, local authorities in the global South are now beginning to integrate the innovations that have spontaneously emerged on their own territories. This change stems from the strong financial pressures experienced by these local authorities, given that they have scant resources to spend on waste management. Whereas the cost of managing one tonne of waste averages €212 in France, it stands at only €38 in Bogotá or €8 in Antananarivo. These internal financial constraints, coupled with the relative weakness of public institutions (highly variable nonetheless from one city to another), are prompting the authorities in each country to redefine a new model for the public waste management service (Jaglin *et al.,* 2018).

This latest model now being developed is no longer restricted to the sole action of a city's local authorities (or its delegatee or service provider). Instead, it involves composite arrangements in which waste management no longer fully belongs to either the public realm or the market economy as it brings together multiple stakeholders within a shared management framework. In this sense, waste is a "fluctuating object" (Cavé, 2015a), that oscillates between a public good (the public cleanliness service itself), a public ill (nuisance) and a private good (recyclable, resalable waste) depending on its state and the surrounding context (Cavé, 2015a: 125), which then makes it an "impure public good" (Cavé, 2015a: 127). The most successful experiments aimed at integrating informal wastepickers or primary collectors or at structuring the residents' sorting and composting activities help to create "a community of commoners" (Micheaux & Aggeri, 2019) around waste. This user community, which jointly defines the rules for an urban territory linked to transforming waste into a resource, creates a common good in the institutional sense of the term (Zapata & Zapata Campos, 2015). The public service actions which do not belong to the municipal service category can thus fall under the category of "common pool resources", as described by the above-cited authors.

The public service then seeks "universality through other avenues" (Jaglin, 2012): the direct financing by public authorities is no longer systematic. Their involvement can take many forms as described above.

5. Conclusion

These six case studies (Lima, Bogotá, Lomé, Antananarivo, Delhi and Surabaya) provide a shifting reading of the boundaries of the public waste management service. The service is sometimes pared down at the margins due to the removal of recyclable and compostable waste ahead of municipal collection (by informal recovery actors or community composting). It can also be reduced upstream when a primary collection system (managed to varying degrees by public authorities) is put in place.

This redefinition of the boundaries of municipal action, whereby some tasks are contracted out to third parties, goes beyond simply privatising the service since it involves neither market-based nor institutional logics. Municipal action, which may include a private company as service provider or delegate, is supplemented by actions that belong to the category of common pool resources. As a result, a distinction is made between the (limited) municipal and (broader) public waste management service. The scope of the public service remains unchanged but the ambition of the municipal service is scaled back (compared to the standards applied in global North countries). The municipal service now has a narrower sphere of direct action – often due to a lack of resources and thus more attuned to a municipality's actual intervention capacities – and takes on a new role of metropolitan-scale coordination.

The highly developed federation of informal wastepickers (Bogotá) or the longstanding solidarity and cooperation within neighbourhood communities (Surabaya, Lomé) are crucial ingredients for shaping new waste management models. When policymakers acknowledge this grassroots influence and make it an integral part of their public policies, the results will open up excellent opportunities.

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