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*Corresponding author: Mario Emmanuel Villalba Ferreira, Institute for Housing and Urban Development Studies, Erasmus University Rotterdam, Burgemeester Oudlaan, 50, 14th Floor, Rotterdam 3062 PA, The Netherlands
E-mail: villalbaferreira@ihs.nl

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POLITICS & INTERNATIONAL RELATIONS | RESEARCH ARTICLE

Towards a typology of inter-municipal cooperation in emerging metropolitan regions. A case study in the solid waste management sector in Ecuador

Mario Emmanuel Villalba Ferreira^{1*}, A. Geske Dijkstra², Laura Quadros Aniche¹ and Peter Scholten¹

Abstract: Inter-municipal cooperation (IMC) is a widely studied governance solution. Most literature defines IMC as a particular service delivery arrangement. However, we argue that IMC manifests itself in several forms and thus a broader definition is necessary. To explore this, we conducted a case study in the solid waste management sector of the emerging metropolitan region in Cuenca-Azogues, Ecuador. Emerging metropolitan regions are particularly suitable for analysing IMC, and so far, there are few studies on IMC in Latin America. Based on the discrepancy between previous studies and the results of our research, we develop a new definition and a new typology of IMC, which can be related to multiple service delivery arrangements.

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Keywords: inter-municipal cooperation; solid waste management; governance; Ecuador; emerging metropolitan regions



Mario Emmanuel Villalba Ferreira

ABOUT THE AUTHOR

Mario Emmanuel Villalba Ferreira is a Doctoral Candidate and Researcher at The Institute for Housing and Urban Development Studies (IHS) of Erasmus University Rotterdam (EUR) in The Netherlands. He is also a Lecturer at the International Public Management Programme of The Hague University of Applied Sciences and Innovation Consultant at 4MYCITY Urban Consulting. His main research focus is on inter-municipal cooperation, multi-stakeholder engagement, emerging metropolitan regions, integrated sustainable waste management and governance of urban commons in Latin America and The Caribbean. Mario holds a Master of Science in Urban Management and Development from IHS, Erasmus University Rotterdam and a BA in Political Science from the University of Richmond in VA, USA.

PUBLIC INTEREST STATEMENT

Municipalities are under constant pressure from complex urban issues such as solid waste management, local economic development, and climate change. Managing waste is both a challenge to and an opportunity for sustainable development. Waste can be a pollutant of rivers or the source of electricity in cities. Waste management is thus of paramount relevance for global agendas such as biodiversity protection, climate mitigation, and the circular economy. Since municipalities play a fundamental role in the implementation of global goals, the demand for effective service delivery is likely to increase. Meeting this demand is a costly and complex effort. To respond to rising demands and limited resources, Inter-Municipal Cooperation (IMC) provides a governance solution. This paper offers a new framework to understand IMC and how cooperation can transform the waste management sector.

1. Introduction

Municipalities, particularly in emerging metropolitan regions, are under constant pressure from complex urban issues such as solid waste management, local economic development, and climate change. Managing waste is both a challenge to, and an opportunity for sustainable development. Waste can be a pollutant of rivers or the source of electricity in cities. Waste management is thus of paramount relevance for global agendas such as biodiversity protection, climate mitigation, and the circular economy (Galicía et al., 2019; Marshall & Farahbakhsh, 2013; Stahel, 2016). While these agendas are universal, in most societies waste management is the responsibility of local governments (Hoorweg & Bhada-Tata, 2012).

Since municipalities play a fundamental role in the implementation of global goals, the demand for effective service delivery is likely to increase. Meeting this demand is a costly effort. Therefore, taking advantage of economies of scale could help in making services more efficient. Economies of scale reduce the average cost of providing a service as the volume of production increases (Hefetz et al., 2012). However, while municipalities have the advantage of bringing the political institutions closer to the people, their limited territory and population size might affect their ability to generate economies of scale to provide services efficiently. Studies have shown that highly densified cities may benefit from economies of scale (Docherty et al., 2004). On the other hand, small and intermediate cities with lower population density, which generally are not the main centres of urbanization and investment, might find it more difficult to provide adequate services on their own because they serve smaller populations and have fewer options for scaling-up service delivery.

To respond to rising demands and limited resources, local governments resort to management and, more recently, governance solutions (Coy et al., 2018). So far, scholars have largely studied inter-municipal cooperation (IMC) as a regional governance solution. Previous studies provide a robust theoretical background to understand some elements of IMC (Bel et al., 2018; Bel & Warner, 2015; Hülst & Montfort, 2007). However, we found three important research gaps that have yet to be resolved.

The first issue refers to the way scholars have defined and classified IMC. Most research defines IMC as a particular form of service delivery that involves the public cooperation between municipalities. The focus of the analysis is on comparing economic performance of IMC against other forms of service delivery such as privatization and in-house management. While this research may be helpful for municipalities that want to evaluate service delivery options, it does not dig deeper into how municipalities exactly cooperate and to what extent there is variation among types of IMC.

The second gap is related to the limited geographical coverage of studies on IMC. Most studies focus on Europe and North America and few (Ali et al., 2019; Silvestre et al., 2019) deal with developing countries where, due to lower financial capacity, IMC might be more urgent (Kim, 2018). In addition, new theoretical insights may arise from studying different contexts. Latin America and the Caribbean is the most urbanized region in the Global South, and yet IMC has received little academic attention in the region (United Nations, 2015).

The third gap regards to the types of cities where IMC has been analysed. Population trends indicate that world urbanization is happening mainly in small and intermediate cities of emerging economies (Roberts, 2014). While smaller than megacities, increasing interaction among these cities generates clusters that potentially become metropolitan regions. Some scholars have conducted research on small and intermediate cities in Latin America (Maturana et al., 2017; Da Silva et al., 2019) but without exploration of IMC in the context of emerging metropolitan regions.

Emerging Metropolitan Region is a socio-territorial term describing the transition of small and intermediate cities towards becoming metropolitan. The process of becoming a metropolitan region increases the complexity of interactions. Some studies (i.e. Feiock, 2007) indicate that

stakeholder heterogeneity within urban networks reduces the opportunities for cooperation. However, it could also open doors for regional cooperation due to a higher awareness of the interdependence between actors (Klijn & Koppenjan, 2012). Because of still relatively low regional interaction, small and intermediate cities are likely to present fewer examples of IMC than consolidated metropolitan regions. Similarly, metropolitan regions may have already chosen a particular type of IMC after processes of trial and error in the transition phase. In both cases, scholars have fewer chances of finding different types of IMC. Therefore, emerging metropolitan regions, which are in a transition phase, may provide a suitable environment for finding a wider IMC variation before the region follows a particular cooperation path (Buuren et al., 2012). They present an opportunity to early advise which type of IMC provides the best regional results.

Within the Latin American region, Ecuador is an interesting case because it has recently made developments favourable to IMC in the waste management sector. In the past ten years, Ecuador had some political reforms, such as a new national Constitution in 2008 and new urban environmental regulations such as the Código Orgánico de Organización Territorial, Autonomía y Descentralización (Government of Ecuador, 2011), hereafter COOTAD. Our preliminary document review identified Cuenca in the Azuay province as an interesting case study because of its particular successful waste management performance. However, the snowball interviews led us to expand the research and include Azogues and the neighbouring Cañar province because of three reasons. First, the beginning of fieldwork (June 2018) coincided with Cañar obtaining the certificate of the first province in Ecuador free of open-air dumps (Castillo, 2018). Second, our initial interviews indicated that IMC played an essential role in that success. Third, our observations showed a strong interaction between Cuenca and Azogues, which fits the characteristics of an emerging metropolitan region.

In light of this context, the objective of this paper is to understand the types of IMC in emerging metropolitan regions and provide a basic categorization that may be helpful in future studies. This paper follows the central research question: what are the types of IMC in Cuenca-Azogues emerging metropolitan region applied to the Solid Waste Management sector? It starts by exploring what the different approaches in SWM are. This process allows mapping the different waste management arrangements in the region. However, we argue that while there are many arrangements in different contexts, grouping them based on common IMC characteristics may lead to a better typology.

The next section presents the literature review and discusses earlier attempts to provide IMC typologies. In the third section, the researchers describe the methodology. The results follow in chapter four. The paper ends with conclusions and recommendations for further research.

2. Literature review

2.1. Governance in emerging metropolitan regions

Defining Emerging Metropolitan Regions requires an understanding of the connection between intermediate cities and metropolitan regions. The Cambridge Dictionary (2018) defines the word emerging as “starting to exist.” Metropolitan Region refers to the concentration of urbanized areas with high levels of population, urban function, and landscapes (Fang & Yu, 2017). Combining these two concepts, we argue that an Emerging Metropolitan Region is a socio-territorial phenomenon that happens when intermediate cities are in a regional transition towards becoming metropolitan.

Our focus on intermediate (or secondary) cities responds to their increasing relevance in urbanization trends. Urbanization is mainly occurring in intermediate cities, which are second-tier cities of less than a million people, less populated and with lower socio-demographic dynamics than primary cities such as country capitals and megacities (Roberts, 2014). United Nations (2015) reports that half of the world’s urban dwellers live in cities of less than 500,000 inhabitants, while only one in eight reside in 33 megacities of more than 10 million people. Therefore,

understanding the urban dynamics of secondary cities is of global relevance because of the potential for large scale impact.

While there is no universal agreement on the concept of secondary cities, a recent publication (Roberts, 2014) provides a clear summary of the main ideas on this concept. Roberts (2014) first discusses the general size of secondary cities. While new trends and technology are making it more diffuse to draw a clear line between the size of primary and secondary cities, most authors provide a range that goes from 100,000 to 1 million inhabitants (Roberts (2014)). However, the size provides only a general indication since sizes vary from region to region, and thus, sharper definitions require other criteria.

In terms of spatial and economic typology, (Roberts, 2014) categorizes secondary cities in (a) subnational (c) corridors and (c) metropolitan.

Subnational secondary cities are the most common type, generally serving as provincial capitals, manufacturing and transport hubs, or natural resource centres (Roberts, 2014). Examples include cities such as Belo Horizonte (Brazil), Kumasi (Ghana), Vancouver (Canada) and Basel (Switzerland). Authors such as Steel (2013) also recognize world heritage centres such as Cusco and Cajamarca in Peru as intermediate or secondary cities because of how their tourism and mining industry has generated internal and transnational migrants, massive foreign direct investment and socio-spatial transformations.

Corridor secondary cities refer to a cluster of cities along a trade or transport corridor (Roberts, 2014). For instance, the development of highways and railways between cities in China generated opportunities for the establishment of new growth poles along trade routes for manufactured products.

Metropolitan secondary cities develop as a given core city grows, and rising land prices push industries and investments to relocate or expand to the outskirts. New secondary cities emerge as part of this economic and spatial situation, eventually forming a metropolitan region of secondary cities. In the LAC context, rural-urban migration and the formation of large informal settlements in the periphery of cities are common trends such as the case of Ciudad del Este, Paraguay (Vázquez, 2013).

Other authors (Fang & Yu, 2017; Gottmann, 1957) also investigated the development of urban agglomerations. Wang (2002, as cited in Fang & Yu, 2017) suggests that the development of urban morphology follows steps from single cities to metropolitan areas, urban clusters, urban agglomerations, and greater metropolitan areas. To explain this process, Wang coined the term “metropolitanization.” Fang and Yu (2017) argue that the current forces of economic globalization and the information era follow a spatiotemporal path that goes from city to metropolitan area, metropolitan area belts, urban belts, and megalopolis. Aligned to this concept, Emerging Metropolitan Region is a new way to indicate the *early stage* of metropolitanization within a particular territory.

The process of becoming a metropolitan region increases the complexity of interactions. Some scholars (i.e. Feiock, 2007) indicate that stakeholder heterogeneity within urban networks reduces the opportunities for cooperation. Nevertheless, it could also open doors for regional cooperation due to a higher awareness of the interdependence between actors (Klijn & Koppenjan, 2012). Because of still relatively low regional interaction, small and intermediate cities are likely to present fewer examples of IMC than consolidated metropolitan regions. Similarly, metropolitan regions may have already chosen a particular type of IMC after processes of trial and error in the transition phase.

The character of Metropolitan Regions and their governance challenges have been studied at least for over a century (Wallis, 1994). In the past, the main issue metropolitan regions faced was the coordination of services to strengthen the competitiveness of the bigger city in a region. However, with an increasingly globalized economy, the current challenge is to harmonize efforts, so the entire region becomes competitive and not only the central city (Wallis, 1994). Therefore, interdependency between cities and the need for governance solutions such as inter-municipal cooperation have both increased. In consequence, big and small municipalities aiming to succeed in a highly urbanized global economy should align their efforts in aspects such as service delivery, environmental protection and regional sustainable development.

However, if municipalities fail to anticipate regional strategies, the increasing complexity of interactions or the rigidity of path dependency (Buuren et al., 2012) may reduce opportunities for effective cooperation. For instance, Coy et al. (2018) indicate that despite the institutionalization of nine metropolitan regions in Brazil, governance efforts in service delivery and policy coordination failed. This failure was because of “institutional weaknesses, a lack of clear responsibilities (municipal vs regional), political conflicts between different levels, and, last but not least, a total lack of democratic legitimization” (Coy et al., 2018, p. 38).

Overcoming these challenges requires long-term planning. Abbott (2009) argues that effective metropolitan planning presupposes a shared common knowledge among stakeholders. This previous knowledge is needed because it facilitates the management of expectations, which is essential for maintaining stakeholder engagement towards a common goal. Therefore, an ideal scenario for testing metropolitan endeavours should minimally involve enough inter-municipal experience (common knowledge).

In sum, the transitional nature of Emerging Metropolitan Regions may provide a suitable environment for testing cooperation endeavours, accumulating common knowledge and facilitating long-term planning of metropolitan regions. Furthermore, studying this type of regions provides an opportunity to early advise on the most appropriate governance solutions.

2.2. Inter-municipal cooperation as a governance solution

While there are small variations in the definitions of IMC, all share similar concepts and characteristics. Agranoff (2004) define IMC as a process involving [but not limited to] joint agreements and co-production among municipalities as a means to gain economies of scale, improve service quality, and promote regional service coordination.

In an analysis of eight European countries, Hülst and Montfort (2007) explain that due to developments in the past 50 years, local governments are under pressure in terms of domain, performance, and existence. They (Hülst & Montfort, 2007, p. 4) highlight three central pressures: “the increasing technical scale of production, the growing scale of social and economic processes and the pressures of the (European) market.”

Municipalities resort to different strategies to cope with these burdens (Hülst & Montfort, 2007). Some, for example, in the United Kingdom, chose territorial reforms where municipalities amalgamate into bigger administrative units. A second strategy is to reduce the responsibilities of cities and redistribute power to other levels of government (Norton, 1994). However, this last strategy is not widespread regarding service provision. The third strategy, inspired by the New Public Management movement, is the outsourcing of public service delivery to the private sector or public-private partnerships (Bel et al., 2010; OECD, 2000). While this strategy might help improve the efficiency of services, it creates issues of accountability and of the protection of public interest (Hughes, 2012). The fourth strategy is IMC. Since this is the topic of the paper, we focus in exploring this concept in more detail.

In the USA, IMC has been a form of service delivery for a long time (Warner, 2006). Warner argues that after direct public production, and privatization, IMC is the third most popular form for service delivery. Here, the hidden assumption is that IMC is not present in direct production and privatization, although theoretically, municipalities that choose these forms of service delivery may be cooperating as well.

In both European and North American literature, there is a common pattern in defining IMC in terms of a particular service arrangement where two or more municipalities set up an associative structure. Dijkgraaf and Gradus (2013) make it explicit that in the Netherlands, IMC involves maintaining public production. Following this assumption may be useful for comparing IMC against other arrangements but does not address the different cooperation patterns that may exist within and across service arrangements independently of the public or private nature of the arrangement. To summarize the different arrangements found in the literature, we created Table 1.

In Latin America, there are two studies (Helmsing, 2001; Quintero, 2006) that systematize some of the experiences of IMC in the region but they do not focus on service delivery. Quintero (2006) focuses on describing the experiences of federations of municipalities, being institutions that represent the municipalities' interest at a national level. He examines the cases of eighteen Latin-American countries and highlights that 23 associations have been created since 1940. These associations mainly provide information and coordination services to access technical and financial cooperation. Helmsing (2001) conducts a meta-analysis of 12 case studies of public-private partnerships and the formation of meso-institutions for local economic development in Argentina, Chile, Colombia, Mexico, and Perú. One of the key findings is that in all cases, a process of collective learning was present as the predominant manifestation of cooperation. While a recent study (Meza et al., 2019) compares the influence of federalism on IMC in metropolitan regions of Brazil and Mexico, the phenomenon of IMC for service delivery in Latin America has not yet been studied.

2.2.1. IMC in solid waste management

The literature on Solid Waste Management focuses on comparing privatization of services and IMC on cost reduction in service delivery (Bel & Mur, 2009). The results are mixed. For instance, using panel data for almost all Dutch municipalities between 1998 and 2010, Dijkgraaf and Gradus (2013) compared different arrangements in waste management including private enterprises, IMC, municipality-owned enterprises and in-house collection. They conclude that privatization leads to higher cost-savings than other arrangements in most situations. However, the only exception arises when comparing privatization and IMC on long-term contracts (over 10 years). In this case, IMC is the best cost-reduction alternative. They did not find significant differences between

Table 1. Service arrangements and characteristics

Service arrangement	Characteristics
(1) Re-allocation to other levels of government	Transfer of responsibilities to the sub-municipal, regional or national government
(2) Privatization	Transferring of responsibilities to private companies
(3) Direct public production	Service delivery within the municipal structure (in-house)
(4) Municipality-owned firm or agency	Service delivery remains in the public realm but through an independent firm or agency
(5) Inter-municipal cooperation	Association of two or more municipalities for service delivery (or another particular purpose) in the public domain
(6) Amalgamation	Two or more municipalities fusion into a single structure

Source: Authors based on Bel and Warner (2015), Dijkgraaf and Gradus (2013), Hülist and Montfort (2007), and Warner (2006).

the other arrangements. However, other studies found either no significant or a negative correlation between IMC and cost-reduction (Bel & Warner, 2015; Soukopová & Vaceková, 2018). These contradictory findings may be because IMC for service delivery may take different forms.

2.2.2. IMC beyond service delivery

The literature on IMC in general, so not related to service delivery, does recognize that there are different modalities of IMC (Hülst & Montfort, 2007). The different categories are based on five dimensions. The first dimension is the degree of institutionalization, which, as Warner (2006) indicates, falls in a spectrum from informal to formal arrangements. The second dimension is the task performed, which could be operational (i.e. service delivery), or policy-related (Bel & Warner, 2015). Third, the number of functions could either be single purpose or multipurpose. Fourth, the governance structure permits a categorization into a single entity (i.e. public company) or multi-governmental when, for instance, inter-municipal councils deal with the cooperation. The last dimension refers to the form of representation in which either elected officials or appointed managers embody the municipalities in cooperation arrangements. Table 2 summarizes the main dimensions and types of IMC found in the literature.

Combinations of different types and dimensions, such as a formal and single purpose or informal and multi-purpose are possible. Also, there might be hybrid versions as part of a continuum between extreme types (Hülst & Montfort, 2007). This classification provides a solid basis for exploring the types of IMC in the Solid Waste Management sector in the Cuenca-Azogues emerging metropolitan region. Given that we focus on just one task (operational) and one function (single purpose), the dimensions task performed, and quantity of functions are less relevant for our aim.

3. Methodology

We chose the case study as our research strategy. A case study is a widespread strategy used in social science research to understand different phenomena within a particular context (Yin, 2014). This type of strategy allows a detailed explanation of the context and generates depth in the analysis (Van Thiel, 2014). Cuenca-Azogues is an interesting case because it fits the characteristics of an emerging metropolitan region with a variety of solid waste management arrangements. We first investigated the site *urbandashboard.org* where the Inter-American Development Bank highlights a list of emerging cities in Latin America with the potential for sustainable growth. Each of these cities has an Action Plan, which consists of a series of technical studies on economic, social, environmental, and governance parameters. Based on a review of the various Action Plans, we identified Cuenca, because of its particular successful waste management performance, and the Azuay province- the potential zone of expansion of

Table 2. Dimensions and types of IMC based on literature

Dimension	Types of IMC	Examples
(1) Degree of Institutionalization	Informal	Policy networks
	Formal	Joint Corporations or Contractual agreements
(2) Task performed	Operational	Service delivery
	Coordinative	Regional Planning
(3) Quantity of functions	Single purpose	Waste Management
	Multi-purpose	Fire and security services.
(4) Governance structure	Single entity	Public company
	Multi-governmental	Inter-municipal councils
(5) Representation	Elected	Representatives
	Appointed	Managers

Source: Authors based on Bel and Warner (2015), Hülst and Montfort (2007), and Warner (2006).

Cuenca- as an interesting case for study. Also, Cuenca fitted the characteristics of a sub-national secondary city with the potential to become metropolitan (Terraza & Beltrán, 2014). However, the snowball interviews (Van Thiel, 2014) led us to expand the research and include Azogues and the neighbouring Cañar province because of their relevance regarding IMC developments.

After the case selection, we conducted more specific desk research of official Ecuadorian documents and relevant secondary publications. We reviewed legal documentation such as the *Texto Único de Legislación Ambiental/Unique Text on Environmental Law*, hereafter TULSMA, which establishes integrated solid waste management as a national priority of public interest (Government of Ecuador, 2012). We also studied the Organic Code of Territorial Order, Autonomy, and Decentralization, hereafter COOTAD, to explore available options and legal frameworks for IMC arrangements. Also, we consulted the National Institute of Statistics and Censuses for SWM and socio-demographic data. Official websites of municipalities, the Association of Ecuadorian Municipalities (AME) and of national ministries such as the Ministry of Environment provided other complementary information on SWM arrangements and cooperation endeavours. Local newspaper publications complemented our search for relevant stakeholders to include them as the first interviewees.

A one-month immersion (24th of June to 26th of July 2018) in CA-EMR allowed a general observation of the metropolitan dynamics in the region. Similarly, the on-site presence facilitated the conduction of face-to-face semi-structured interviews with stakeholders and informants from five municipalities, civil society, public, private, and academic sectors (see Appendix A1, Table A2 for detailed profile of interviewees). The interview questions focused on understanding the characteristics of service arrangements to manage waste (Table 1) and the types of cooperation (Table 2) in the region.

We conducted a total of 15 interviews, out of which 14 were recorded and transcribed. The first three respondents included one from a municipality, one from a civil society organisation and one from the Ministry of Environment to include diverse perspectives. These respondents were chosen based on the relevance of their work in the solid waste management sector. The next interviewees were chosen following the recommendation of the previous respondents; applying the snowball technique. We guaranteed the anonymity of respondents in order to reduce socially acceptable or politically correct answers. One interview we did not record at the request of the respondent, and while we took notes, we did not code the results since no new information was added also confirming saturation of information (Van Thiel, 2014).

For the data analysis, we used the software Atlas TI, which allowed a systematic process of analysing the interview responses. After each interview, conducted in Spanish, we transcribed and uploaded the transcription to the software in the original language. We coded the respondents as R1 to R14. With all the interview documents, we created specific codes related to the research questions as well as some other relevant information collected during the interviews (see Appendix A1, Table A1). After the coding, we did a translation of all quotes to include them in a separate document. The codes allowed a comparison of relevant information, grouping of ideas and organisation for a more lucid qualitative analysis.

4. Results

The analysis of empirical data follows three steps that are divided into sub-sections. The first subsection provides a general policy framework that regulates Ecuadorian municipalities in solid waste management (SWM) and cooperation aspects. Next, the characteristics of service delivery arrangements in the region are described in the second subsection. Finally, the last subsection explores the distinction between service delivery arrangements and types of inter-municipal cooperation, which results in a new IMC framework.

4.1. A catalyser for new governance arrangements: The national programme for the integral solid waste management

2008 was a pivotal year for the beginning of new forms of SWM arrangements and cooperation patterns. Respondents repeatedly mentioned that the Ecuadorian government has historically focused on the development of Quito and Guayaquil, and the rest of regions and municipalities (or cantons) had not received much attention. However, since the establishment of a new Ecuadorian constitution in 2008, which was followed by policy documents such as the COOTAD, the role of municipalities or Autonomous Decentralized Governments became more relevant, and the national government became more involved in transferring responsibilities and resources to the municipalities.

The COOTAD (Government of Ecuador, 2011) established that municipalities could merge and form metropolitan regions or cooperate through regional enterprises and alliances for the provision of services. However, by July 2018, when the fieldwork finished, only Quito had the official status of Metropolitan Region, and we did not find a new project of amalgamation. A variety of examples of inter-municipal cooperation exists in Ecuador, but academic analysis of these experiences is rare. One of the relevant findings in the COOTAD is that there is a variety of legal options available for municipalities to cooperate at an inter-municipal and regional level besides amalgamation. The challenge, therefore, rather than being legal, is related to governance and implementation aspects. Another important aspect of the COOTAD is that it establishes that municipalities are the main responsible institutions to manage solid waste.

Despite this new legal framework that allows governance innovations in the SWM sector, the Ministry of Environment analysed data from 2002 to 2010 and concluded that few improvements were accomplished regarding SWM (Government of Ecuador, 2012). From a total of 221 Ecuadorian municipalities, 160 disposed their waste in open-air dumps which contaminated water, soil, and air resources. This environmental hazard harmed the health of citizens and in particular that of people making a living by collecting and reselling garbage in poor conditions. Considering this, the Ministry of Environment created the National Programme for the Integrated Solid Waste Management known as PNGIDS (Ministerio del Ambiente, 2019). The main objective of PNGIDS is to implement an environmental policy of Integrated Solid Waste Management in Ecuador, focusing on inclusive recycling and sustainable disposal of waste following the environmental legislation (Government of Ecuador, 2012).

A specific objective of PNGIDS is the promotion of the creation of associations of municipalities known as *mancomunidades* for the joint provision of SWM services, particularly between small municipalities. Within this new context, municipalities had to find creative governance solutions to transition towards more sustainable forms of SWM. The next two subsections discuss the results regarding the governance aspects in terms of service delivery arrangements and IMC processes.

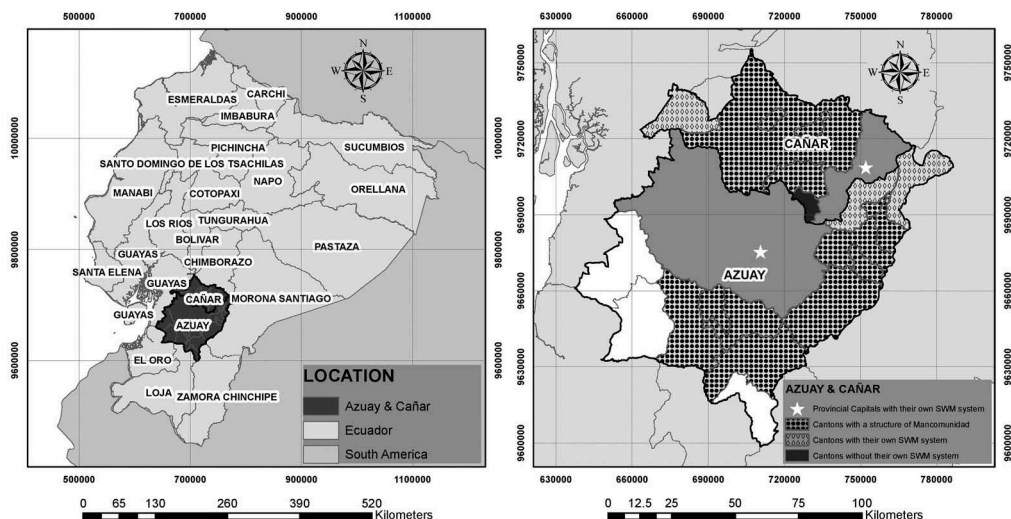
4.2. SWM arrangements in CA-EMR

Analysing SWM service arrangements in Cuenca-Azogues Emerging Metropolitan Region (CA-EMR) followed three steps. First, the research delimited the territorial reach of CA-EMR. The interviews and observations revealed that the emerging region includes 12 municipalities (out of 15) from Azuay province and all seven municipalities from Cañar province. The white area in Figure 1 indicates the municipalities (Camilo Ponce Enriquez, Pucara, and Oña) that, according to the relevant respondents, have less interaction with Cuenca-Azogues because of either a mostly rural condition or their lack of infrastructure to connect with other municipalities. However, given the dynamic urbanisation processes in the region, the emerging metropolitan region could soon cover both provinces.

The second step of analysis consisted of locating the different SWM arrangements in a regional map (Figure 1). The grey areas with white stars in Figure 1 indicate the provincial capitals (Cuenca and Azogues). The black-dotted area indicates municipalities that formed *mancomunidades*. The

Figure 1. Azuay and Cañar Provinces, Ecuador.

Source: Departamento Interdisciplinario de Espacio y Población, Universidad de Cuenca based on authors findings.



Coordinate System: WGS 1984 UTM Zone 17S

Map author: Departamento Interdisciplinario de Espacio y Población. Universidad de Cuenca, Ecuador

area with diamond patterns represents municipalities that manage waste in a traditional way (In-house Public Management) but are not a provincial capital. The black area indicates the municipality of Deleg which buys services from both Cuenca and Azogues for waste treatment and disposal.

The third step consists of describing the characteristics of the different SWM arrangements. The interviews indicated that municipalities in the region use four types of arrangements (Table 3).

A first arrangement is that of In-house Public Management. Through this arrangement, the waste management resources come from allocations by the municipal legislative branch in the annual budgets which the municipal structure (later) manages. Here it is important to differentiate Azogues, which has better economies of scale to build and maintain a modern landfill, from smaller municipalities like Paute that must subsidize the service to provide a basic landfill site.

The second type of SWM arrangement is External Public Provider. Under this method, a municipality disposes its waste at a landfill site of another municipality for a service fee. This option is useful, particularly for municipalities with low levels of solid waste generation such as Deleg. Instead of creating an internal waste management system, this municipality has arrangements with both Cuenca and Azogues.

Is Cuenca planning to form a mancomunidad? We have not made progress on that idea but let us say that in practice, we are receiving waste from other cantons. In practical terms, yes but we have not really brought that topic to the mayor's attention. **R4**

A third arrangement is a Municipal Public Company. Cuenca was a pioneer in implementing this structure in the region through the creation of the Municipal Cleanliness Company of Cuenca (EMAC). This arrangement gave the company autonomy to directly collect the waste tariffs through an agreement with the public energy company and work on making the company financially self-sustainable. Cuenca now is a best practice case because of their environmental, technological, and managerial achievements. One example is that Cuenca is the only municipality in the region whose waste management system transforms landfill material into electricity.

Table 3 summarizes the SWM arrangements and their characteristics:

Table 3. SWM arrangements and characteristics

SWM arrangement	Municipalities	Characteristics
(1) In-house Public Management	Azogues and La Troncal (Cañar); Paute and Sevilla de Oro (Azuay)	Traditional management of SWM. A department administers the waste within the municipal structure. The city council assigns a budget to the SWM services.
(2) External Public Provider	Deleg (Cañar)	When one municipality does not have an internal system of SWM and buys the service from an external provider.
(3) Municipal Public Company	Cuenca (Azuay)	When one municipality decides to create a public company to organize the SWM service. The budget, which often comes from a unique tariff, is administered separately from the municipal structure.
(4) Joint Municipal Public Company (mancomunidad)	EMMAIC-EP Pueblo Cañari (Cañar, Biblian, Suscal, El Tambo). Cañar province.	Various municipalities create a separate structure to share management, costs, and benefits.
	EMMAICJ-Rio Jubones (Santa Isabel, Nabon, Girón, San Fernando). Azuay province.	
	EMMAICP (Gualaceo, Chordeleg, Guachapala, Sigsig, El Pan). Azuay province.	

Source: Authors

The fourth type of arrangement are *mancomunidades* (Joint Municipal Public Company). These are associations of various municipalities that create a shared structure to manage their waste together. The main difference between this arrangement and the Municipal Public Company is that in a public joint venture more actors (not just from a single municipality) are involved, and complexity and opportunities for IMC are assumed to increase. In other words, the arrangement is similar to a public company, but the cooperation patterns are different. In the past ten years, three Joint Municipal Companies were created in the region. However, in 2018 one of them already closed and another one was immersed in an administrative crisis. According to respondents, this was due to bad administrative management and lack of political will and leadership to sustain the initial cooperation. Currently, after these unsuccessful experiences in the Azuay province, the former municipal partners either buy services from neighbouring municipalities or went back to the traditional In-house Public Management model. On the other hand, the *mancomunidad* from Cañar province (first in the table) succeeded and is now considered a best practice case for Ecuador and even obtained international recognition.

In fact, *mancomunidades* have been formed, and the idea is those small municipalities that are in a geographical area, in a province, they can come together and solve the problem that is common to them. **R9**

To conclude the analysis in this subsection, we contrast the SWM arrangements found in literature with our empirical findings. Previous studies found six options for SWM service delivery (Table 1). The empirical findings in the Cuenca-Azogues emerging metropolitan region reveal four SWM arrangements (Table 3). The other arrangements mentioned in literature, re-allocation to other government levels and privatization, are not present in the region.

Overall, the results on SWM arrangements indicate that the PNGIDS served as a catalyser for the exploration of various service delivery options, not only for *mancomunidades*. However, as

indicated in the difference between the methods chosen by Cuenca and the joint public venture in Cañar, while the service delivery design can be similar (i.e. municipal company) the cooperation patterns (i.e. individual vs. collective) can also differ. Therefore, unlike previous literature, making a clear differentiation between these two concepts is relevant for understanding how IMC works. The next section focuses on describing the types of IMC found in the region.

4.3. Types of IMC

To classify the types of IMC in CA-EMR, the analysis follows three phases. Firstly, we contrast the literature review with the pattern of responses in our empirical findings. Secondly, we describe the characteristics of each type of IMC within a new framework. Thirdly, we explore how different SWM service arrangements relate to this IMC framework in CA-EMR.

Regarding the first phase, an important finding of our literature review is that scholars writing on municipal service delivery conceptualize IMC as a particular type of service delivery arrangement, next to e.g., privatization or having a municipal company (Table 1). This wrongly assumes that cooperation between municipalities is absent in other arrangements. Other authors developed a more general typology for IMC, based on five dimensions (Table 2). Out of these dimensions, we excluded two (task performed and quantity of functions) because our research focuses on one type of task (service delivery) and one function (waste management). We took the other three dimensions (Institutionalization, Governance, and Representation) into account and found them useful because they are closely linked to cooperation processes. Additionally, our interviews indicated that that two other dimensions are also relevant: the type of interaction and the level of commitment. Furthermore, the pattern of responses in our empirical analysis revealed that there are three overarching types of IMC: Indirect, Transactional, and Collaborative. The three types differ on all five dimensions and these differences provide more precise indicators to categorize different cooperation process.

Table 4 provides the basis for a new theoretical classification of IMC types and their dimensions.

In the second phase, we explain the new framework shown in Table 4 and describe the characteristics of each type of IMC. The first type of IMC is categorized as Indirect. Indirect IMC refers to one extreme of the spectrum of possibilities where the presence of IMC is the lowest. Solid Waste Management arrangements where only one municipality is involved in the process, such as In-house Public Management, still present IMC characteristics in the form of trainings and open information sharing (i.e. website or brochures) with other municipalities. Since no contract is present, there are no specific commitments, representation is unclear, and the institutionalization is informal. The cooperation ends when municipalities close all channels of information exchange.

Table 4. Types of IMC

Dimensions/Types of Cooperation	Indirect	Transactional	Collaborative
(1) Type of interaction	Knowledge exchange	Buying/Selling	Shared management
(2) Commitment	Uncommitted	Contractual	Partnership
(3) Governance complexity	Low	Middle	High
(4) Representation	Unclear	Managers	Elected officials
(5) Degree of institutionalization	Informal	Formal	Formal

Source: Authors

We always cooperate. For example, the mancomunidad of Cañar, which has a lot success, it was served by Cuenca on many occasions. They started their solid waste management restructuring process, the tariff structure and the ordinance (based on Cuenca). **R8**

The second type, Transactional IMC, indicates a type of IMC where there is a formal channel of cooperation and where at least two municipalities are involved. Cities with transactional IMC cooperate based on contractual agreements with neighbouring municipalities where one is the seller of the service and the other one is the buyer. Each municipality designates a manager to represent their interests, negotiate a contract, and ensure implementation within a time frame. There is a middle level of governance complexity around the application of contracts. The cooperation concludes when the contracts expire.

Collaborative, the third IMC type, represents the highest level of governance complexity. This category requires two or more municipalities to formalize a shared structure of long-term cooperation. In Cuenca-Azogues, joint ventures in the form of *mancomunidades* are examples of collaborative IMC where municipalities involved share investments, risks, responsibilities, and gains. Elected officials (mayors) of each municipality form a council that oversees the management of the partnership. The cooperation ends when the partnership is dissolved.

For the third and last phase, we indicate how the IMC types while still connected to waste management arrangements correspond to a separate category. Table 5 shows how the waste management arrangements found in the region align with the types of IMC. In the service delivery category of In-house Public Management, Azogues cooperates with other municipalities in both indirect (open knowledge sharing) and transactional (selling of hazardous waste treatment for a fee) manners. However, in other municipalities with similar arrangements (i.e. Paute), the type of IMC is only indirect, manifested mainly through knowledge sharing and training events.

Table 5. Types of SWM arrangements and types of IMC in CA-EMR

SWM arrangements	Municipalities	Characteristics of IMC	Type of IMC
(1) In-House Public Management	Azogues (Cañar)	Open knowledge exchange + selling treatment of waste	Indirect and Transactional
	Paute (Azúy), Sevilla de Oro (Azúy), La Troncal (Cañar)	Open knowledge exchange	Indirect
(2) External Public Provider	Deleg (Cañar)	Open knowledge exchange + buying solid waste management service from Cuenca and Azogues	Indirect and Transactional
(3) Municipal Public Company	Cuenca (Azúy)	Open knowledge exchange + selling treatment of waste	Indirect and Transactional
(4) Joint Municipal Public Company	EMMAIC-EP Pueblo Cañari (Cañar, Biblian, Suscal, El Tambo). Cañar province.	Open knowledge exchange+ municipalities created mancomunidades to share management, costs and benefits	Indirect and Collaborative
	EMMAICJ-Rio Jubones (Santa Isabel, Nabon, Girón, San Fernando). Azúy province.		Indirect and Collaborative
	EMMAICP (Gualaceo, Chordeleg, Guachapala, Sigsig, El Pan). Azúy province.		Indirect and Collaborative

Source: Authors

In the case of the Municipal Public Company that Cuenca operates, various municipalities from Cuenca-Azogues regularly request some assistance (indirect and transactional). For instance, when two *mancomunidades* in Azuay struggled, Cuenca agreed to receive and treat their solid waste in exchange for a service fee. This rearrangement implied a change from a collaborative to a transactional mode of IMC for the struggling municipalities. The main risk of this transactional type of IMC for small municipalities is that they have no control over service prices or other decisions other than leave or remain in the IMC arrangement where the service provider has more leverage. The same risk holds for municipalities that chose the arrangement External Public Provider, such as Deleg, where the type of IMC is indirect and transactional.

The last SWM arrangement found in the region is Joint Municipal Public Company. Under this arrangement, besides indirect IMC, the process is collaborative because all members have a share and decisions regarding the management of the *mancomunidad* must be continuously analysed and are jointly made. We found three different cases of *mancomunidades* in Cuenca-Azogues. However, the governance complexity of these arrangements is high, and as a result, only one remained fully active in 2018.

Overall, when comparing the governance arrangements between municipalities of Azuay and Cañar we found five main reasons for choosing cooperation types. First, the role of the Ministry of Environment in enforcing the PNGIDS (i.e. imposing sanctions for non-compliance) was an incentive for all municipalities to improve SWM services and cooperate at least at the most basic level (Indirect). Second, Cuenca and Azogues, attempting to benefit from their economies of scale and their role as provincial capitals, chose the transactional type of cooperation to sell their services to smaller municipalities. Third, most other municipalities chose collaborative IMC through the formation of *mancomunidades*. These municipalities were motivated by the potential efficiency gains that this governance approach could bring. Fourth, the other municipalities chose the Indirect, Transactional or a combination of both IMC types. Of these municipalities, Deleg was initially the only one that chose transactional IMC (as buyer of services). Deleg decided this after doing a cost-benefit analysis comparing In-House Public Management and External Public Provider. However, after two *mancomunidades* failed, municipalities from Azuay that in the beginning chose the collaborative type also moved to the transactional one as an alternative. Fifth, three municipalities (Paute, Sevilla de Oro and La Troncal) chose to remain only in the most basic Indirect IMC type and preferred to continue with their traditional In-House Public Management.

Incorporating these findings, we provide an alternative IMC typology after a detailed empirical study in CA-EMR. The analysis included an exploration of solid waste management as well as cooperation policies relevant to the region. Besides, our case study provided a new testing ground for differentiating service delivery arrangements from cooperation types. The results provide strong evidence that serves as basis for redefining and re-categorizing IMC.

5. Discussion: How do the findings in CA-EMR provide a new framework to study IMC in emerging metropolitan regions and beyond?

The findings in CA-EMR revealed that Emerging Metropolitan Regions (EMR) provide a suitable testing ground for studying IMC. In an EMR context, municipalities are likely to try various cooperation models before they adhere to a fixed IMC type. This provides a learning arena both for researchers and practitioners before the complexity of metropolitan challenges increases. For instance, in CA-EMR some municipalities first experienced collaborative IMC and later transitioned to the transactional model. Similarly, municipalities that first chose indirect IMC may learn from the successes of collaborative endeavours from their neighbours and later explore this option.

Our study in CA-EMR also provides four other important insights. One of them is the relevant role of external stakeholders, such as the Ministry of Planning, in promoting new governance strategies toward development goals. Without the active role of key external stakeholders, EMR may not have sufficient incentive for widespread testing of governance models. It will be worth exploring the role of other actors such as civil society organizations, business organizations and academic community as catalysers for governance innovations in other regions and other contexts beyond waste management.

The second insight is the importance of applying a general conceptualization of IMC. By doing so, our research allowed a deeper analysis of the cooperation phenomena. The results indicate that IMC goes beyond a particular service delivery. While in previous studies IMC was classified as a particular service arrangement, it would be better to use the term Joint Public Venture (i.e. Joint Municipal Public Company) for such a specific collaborative arrangement. In further studies, IMC could be left to indicate various types of cooperation.

The third insight is that reducing complexity in the classification of IMC could be helpful to allow effective cross-case comparisons. There are various service delivery alternatives that could be classified under three overarching IMC types. The literature classifies types of IMC according to five dimensions (Table 2). However, on the basis of our empirical study, we propose a revised version with five dimensions and three types of IMC: informal, transactional and collaborative (Table 3). Although the number of dimensions remains the same, we excluded two and added two for reasons explained above.

Our final insight is that different cooperation types are not necessarily mutually exclusive. Within our study, results indicate that municipalities can simultaneously have different types of IMC. We found that all cases included some form of indirect IMC. We also found examples that combine indirect with either transactional or collaborative IMC. However, we did not find combinations of transactional and collaborative IMC within a particular SWM arrangement. This might imply that after trying basic forms of cooperation (indirect), municipalities have the option of choosing either a transactional (i.e. selling services among each other) or collaborative (i.e. creating a Joint Public Venture) IMC.

This paper provides a clear categorization of types of IMC within Cuenca-Azogues waste management sector, which can also be used in other contexts. Although the arrangements may vary, the types of IMC can remain the same. Furthermore, we believe that this new typology of IMC has the potential to be used for other types of municipal service delivery or functions more broadly. Stakeholders interested in exploring IMC can use this framework to evaluate how different governance arrangements facilitate or hinder development outcomes.

6. Conclusions

Inter-Municipal Cooperation (IMC) is a regional governance solution to which scholars are giving increasing attention. While previous studies provide robust theoretical foundations, the concept has ample room for development. Our research identified three important literature gaps. The first issue refers to the way previous scholars have defined and classified IMC, which limited the debate within service delivery parameters. The second gap is the limited geographical coverage of studies on IMC. The third gap regards to the types of cities where IMC has been analysed may not provide enough IMC variation. In our attempt to fill these gaps, the objective of this paper was to understand the types of IMC in Cuenca-Azogues Emerging Metropolitan Region (CA-EMR) in Ecuador through a case study in the Solid Waste Management (SWM) sector.

This study addresses the first issue by conceptualizing IMC not as a particular service delivery arrangement but as a wide range of cooperation possibilities between municipalities. With this conceptualization of IMC, we explored the different service delivery arrangements in CA-EMR. The results have shown that there are four types of arrangements: In-house Public Management, External Provider, Municipal Public Company, and Joint Municipal Public Company. In previous conceptualizations, only municipalities under Joint Municipal Public Company arrangements were considered to engage in IMC. However, our empirical study contribution indicates that municipalities under other arrangements also engaged in IMC. On this basis, we argue that it is inaccurate to refer to IMC as a particular SWM arrangement. Rather, we should leave the concept of IMC to refer to the diverse cooperation processes municipalities can choose from to work together across different service arrangements.

Based on these findings, the paper proposes a new framework to understand and classify IMC. It suggests three types of IMC: a. indirect, b. transactional, and c. collaborative. These types of cooperation have clear characteristics that differentiate them from each other based on five dimensions: (1) type of interaction, (2) commitment, (3) governance complexity, (4) representation and (5) degree of institutionalization. These typologies build upon previous theoretical contributions on IMC (Ansell & Gash, 2007; Bel & Warner, 2015; Feiock, 2007; Hülst & Montfort, 2007; Lintz, 2016; Swianiewicz & Teles, 2018). However, these contributions go beyond them by combining theoretical analysis and qualitative empirical evidence in a previously unexplored setting.

Regarding the limitations to the variety of IMC testing grounds, the majority of previous studies focused on Europe and North America. Our research in Ecuador provides a new geographical perspective from a region where IMC has hardly been studied. With this new perspective, municipalities in Latin America and the Global South now have empirical evidence on IMC that can more closely relate to their contexts.

Furthermore, the focus on Emerging Metropolitan Regions provides a new angle from where a new line of comparative research could emerge using the variation of IMC types. For policy purposes, municipalities and other agencies could take advantage of the living laboratory that EMRs provide and test various cooperation formats before choosing permanent structures.

With this new IMC typology, studies may be better able to grasp the different cooperation dynamics. Although SWM arrangements and terminologies will be different in other regions, this new typology may remain relevant for future research as a basic (yet clear) differentiation between different types of IMC. This also opens up possibilities for research comparing the three types of IMC and linking them to performance outcomes. Nevertheless, we recognize that studies in other Emerging Metropolitan Regions in Latin America or elsewhere could provide new theoretical insights and may lead to changes in this typology. For instance, in this study, we did not find SWM arrangements that combined transactional and collaborative IMC. In future studies, this may occur, and the theoretical implications are worth exploring. In addition, further qualitative work may provide insights into the reasons why certain municipalities choose particular types of IMC for solid waste management or in other policy areas.

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Author details

Mario Emmanuel Villalba Ferreira¹

E-mail: villalbaferreira@ihs.nl

ORCID ID: <http://orcid.org/0000-0001-5707-7154>

A. Geske Dijkstra²

E-mail: dijkstra@essb.eur.nl

Laura Quadros Aniche¹

E-mail: quadrosaniche@ihs.nl

Peter Scholten¹

E-mail: scholten@ihs.nl

¹ Institute for Housing and Urban Development Studies, Erasmus University Rotterdam, Rotterdam, The Netherlands.

² Department of Public Administration and Sociology, Erasmus University Rotterdam, Rotterdam, The Netherlands.

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Appendix A1. Codes and profiles of interviewees

The following table summarizes the codes used in the analysis of the interview transcriptions.

Table A1. Codes for analysis

Codes	Code group
<ul style="list-style-type: none"> - Institutional arrangements - Non-institutional arrangements - Other arrangements 	Solid Waste Management arrangements
<ul style="list-style-type: none"> - Common Institutional Characteristics of IMC - Common Characteristics of Processes - Common characteristics of stakeholders - Other common characteristics 	IMC typologies

Source: Authors.

Table A2. General profile of interviewees

No.	Sector	Characteristics	Municipality/Level
1	Civil Society	Expert on Solid Waste Management (SWM) and active member of SWM networks.	CA-EMR
2	Private	Entrepreneur in the SWM business sector.	CA-EMR
3	Public	High-level position in SWM at a municipality	Azogues-Cañar
4	Public	A key technical level civil servant	Mancomunidad Rio Jubones—Azuay
5	Public	High-level public servant from the Ministry of Environment.	National government
6	Public	High-level public servant from the regional government.	Cañar Province
7	Public	High-level manager at SWM company	EMAC-Cuenca
8	Public	Technical professional at SWM company	EMAC- Cuenca
9	Civil Society	High-level representative of civil society organization within the SWM sector at the National Level.	National
10	Public	High-level manager of SWM company	Mancomunidad Pueblo Cañari—Cañar
11	Private	Informal SW collector	Paute-Azuay
12	Academia	Academic/expert in SWM.	CA-EMR
13	Academia	Academic/expert in Governance.	CA-EMR
14	Public	Technical level manager of SWM	Paute-Azuay
15	Public	Representative from PNGIDS (National program of Solid Waste) —unrecorded	National

Source: Authors.



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