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When urban modernisation entails service delivery co-production: a glance from Medellín

Catalina Duque Gómez and Sylvly Jaglin

Laboratoire Techniques Territoires et Sociétés (LATTS), ENPC - Université Paris Est, Champs sur Marne, France

Through the example of Ciudadela Nuevo Occidente, a large social housing district in Medellín, this article describes a process that primarily involves co-learning and micro-negotiations that help produce the cognitive alignment necessary to the management of services. The hypothesis put forward in this article is that the frictions caused by the residents' difficulties in adapting to the socio-economic, cultural and cognitive frameworks of their new environment, imposed by urban modernisation running processes, engender forms of service co-production that ultimately strengthen the utility's capacity to extend and adapt its delivery model while enhancing the quality of services.

Keywords: Co-production; residential services; urban modernisation; social housing

1. Introduction

The processes of urban transformation underway in the city of Medellín since the early 2000s are driving changes in ways of life and necessary adjustments to urban management. Here, we examine the rehousing of populations – often from informal districts – in apartment buildings, exploring how it puts pressure on the provision of residential services, on the nature of the relations between providers and users, and the distribution of responsibilities in the day-to-day management of the service.

Whereas the literature on networked services in cities of the South, especially in South America, has emphasised the challenges of supplying services in poor and informal – not to say illegal – neighbourhoods (Moretto 2010; Pilo' 2015; Pérez 2013) and discussed at length the effects of privatisation and liberalisation reforms (Botton 2004, 2007; De Gouvello and Fournier 2002; López Rivera 2013; Pérez 2000), this paper has a different point of view. It examines the role of residential services (water, sewerage, electricity and gas) in urban modernisation, highlighting their contribution to three processes of change: the formalisation of relations between residents and urban institutions; the extension of individual social benefits associated with homeownership in apartment buildings; and the integration of new groups of dwellers in the provision of residential services, thereby producing adjustments in their management.

The notion of co-production of urban networked services in cities of the South is often associated with different forms of partnership between state and non-

state actors like CBOs and NGOs in contexts of fiscal constraints and/or weak public authorities (Allen 2013; Allen, Dávila, and Hofman 2006; Batley and Mcloughlin 2010; Jaglin 2005; Joshi and Moore 2004; Moretto 2014). Recently, it has also been associated with delivery of services by informal private providers (Ahlers et al. 2014). We argue that Medellín offers another configuration of the 'multiple facets of co-producing' (Alford 2014) under the 'classical interpretation of co-production as the involvement of individual citizens and groups in public service delivery' (Verschuere, Brandsen, and Pestoff 2012, 1086). In the case of Ciudadela Nuevo Occidente (subsequently referred to as 'Ciudadela'), a new social housing district for first-time buyers, the provision of residential services brings together residents, as direct consumers; their representatives in the condominiums (the building leaders); the municipal service operator, Empresas Públicas de Medellín (EPM); as well as the municipality (mainly through its social housing institute, ISVIMED). We use the concept of co-production to define this configuration, in which interactions between heterogeneous actors involved in the provision of service (Ostrom 1996) entail forms of coordination and processes of co-learning and micro-negotiations that help produce the cognitive alignment necessary to the management of services in social housing estates where EPM meets heterogeneous public.

The focus is on those processes of interactions that produce particular service modalities: we look at the 'small' arrangements that make the service work, including for those who, otherwise, would be excluded by formal rules. This is based on the premise that 'the production of a service, as contrasted to a good, [is] difficult without the active participation of those supposedly receiving the service' (Ostrom 1996, 1079). Therefore, we understand co-production as 'an essential and inalienable core component of service delivery' (Osborne and Stokosch 2013, S32), and we analyse how it manifests in operational terms as a 'consumer co-production' according to Osborne and Stokosch's typology (2013, S37). Our approach combines three levels of analysis.

The first one focuses on the household and its living space, where residential services are a vehicle for the routinisation of 'proper' consumer's practices associated with home-ownership and official connection to the municipal networks. The relationship with EPM (through individual subscription, metering and billing) is thus part of a 'regularisation' process (Pilo 2015) through which residents and the utility jointly contribute to the advent of a 'modern' city. Co-production appears here in the way households juggle with service delivery conditions, shifting exceptional commercial measures into daily and recurrent solutions in order to cope with formal service.

The second level is the condominium. Co-production is in this case related to the distribution of responsibilities regarding fraud and payment of communal bills, leading to the gradual construction of a semiformal framework of collaboration between agents – residents, building leaders and service providers – who need to find shared collective rules, mechanisms of social control and methods of conflict settlement in the management of condominiums.

At the third level, we examine how service delivery in Ciudadela is an outcome negotiated between EPM, local institutions and the new dwellers rather than one dominated by the utility alone. This shows that, although inhabitants of

social housing do not take part directly in the delivery of residential services, they contribute to it: their input is decisive to build trust and facilitate the process of cognitive alignment required for more efficient and affordable services. Even though inhabitants bear the greater part of the effort to adapt their behaviour and consumer practices, the service arrangements that really work result from a co-construction with EPM and other institutional actors, whose compromises are also necessary. More than 'technologies of government' enacted through disciplinary and regulatory devices by EPM, the co-production of services then becomes an experimental method for stabilising and regulating the techno-commercial relationship established between the utility, local housing actors and residents both as individuals (households) and collectives (condominiums).

The paper is divided into four parts. The first situates the Ciudadela district in relation to urban modernisation policies, the residential pathways of the households surveyed and the methods and theoretical framework of the argument. Each of the next three considers the arrangements for the co-production of services at a different level: the household level, the apartment building level and the social housing district. The study's main findings about the co-production of services in southern cities are summarised in the conclusion.

2. Systems of co-production and urban modernisation

Medellín attracts international attention because of the 'urban transformation' underway since the early 2000s. The municipal programmes of recent years¹ have applied a vision of the modern city based on planning urban development (control of urban sprawl, densification, regularisation of land ownership and economic activities, construction of amenities and public spaces. . .), restoring institutional presence in working-class neighbourhoods, involving the private sector in the making of the city and producing 'decent' living conditions for the whole population (education, health, housing, employment, transports, etc.). 'Sharing the benefits of development' and correcting a 'historical debt' to the inhabitants of working-class districts abandoned by the State are at the heart of political discourses explaining urban policies. Since the term of office of Sergio Fajardo (2004–2007) and the implementation of a communication and urban marketing strategy around the 'social urbanism model', transformations combining competitive modernisation and inclusion have become more visible and have acquired significant international recognition.² Physical transformation – through *Proyectos Urbanos Integrales* (PUI), the modernisation of transport infrastructures (Metrocables and Metroplus) and the construction of educational facilities – is to 'achieve the urban integration of neighbourhoods and increase opportunities for those who live and work there' (Dávila 2012, 12) and is recognised as a lever of social transformation (Brand 2013, 6).

2.1. Co-production: collaborative learning for urban integration

Strategic as it is, however, the material transformation of the built fabric alone is not enough to accomplish all the changes involved in the urban modernisation plan. Changes in urban ways of life, in the use of public space and in

consumption practices of services are equally important, and require the support of the city's inhabitants. We focus here on inhabitants rehoused in an area of social housing condominiums. Since many come from precarious neighbourhoods where they had access to services (water, electricity) on a collective and informal basis, they face a steep learning curve on issues such as apartment life, formal homeownership and its consequences (in particular taxes and meters), the individualisation of commercial relations with the operator and the collective management of condominiums. But, even when the principle of payment and the disciplining mechanisms associated with a 'modern' urban life are not contested, a meter, a water tap or an electrical connection do not guarantee that users are able to manage the socio-technical chain that constitutes a properly operating service (Akrich 1998, 2010). In Medellín, as in many other southern cities, urban policies of modernisation targeting low- and middle-income neighbourhoods combine two components: the commodification of many urban goods and services that were previously free in informal settlements and the formalisation of citizenship. The implementation of this 'social compact' through urban networked services has been well documented (Jaglin 2005, 2014; Luque-Ayala 2016; Pilo, 2015), and studies on Colombian utilities also emphasise how they combine reforms associated with neo-liberalisation, extension of (water) supply and the modernisation pursued by urban policies (Acevedo Guerrero, Furlong, and Arias 2015; Furlong 2013; López Rivera 2013). Against this backdrop, we question how strategic policies are developed into workable actions by utilities in a social housing district in Medellín: we examine the material effects, places and modalities of EPM–dweller interactions, the content of their everyday negotiations to domesticate the conditions of service delivery, their results and limitations.

We consider the activities of both dwellers, supported by political actors, and EPM's and ISVIMED's (municipal social housing institute) staff contributing to the provision of services in social condominiums to be a form of co-production that is an unstable and pragmatic process of collaboration between heterogeneous actors. At first sight, it follows the general definition provided by Ostrom: 'By co-production, I mean the process through which inputs used to produce a good or service are contributed by individuals who are not 'in' the same organization' (1996, 1073). Under this definition, the notion covers the processes observed in Medellín but fails to describe them accurately and distinguish them from those found in other urban situations.

In the South, the concept has multiple meanings and has been associated with different policies and objectives. In the 1970s and 1980s, the co-production of services was mainly associated with a substitutive principle in which government inputs were replaced by contributions in money and in kind from communities in poor neighbourhoods. From the 1990s onwards, in the wake of the so-called privatisation reforms, co-production was conceived more as a form of cost sharing between utilities and consumers, the last being considered as active asset-holders in the service relationship. More recently, it has been suggested 'that informality in the water sector is best understood as a process of co- production' (Ahlers *et al.* 2014, 5), while the formalisation of hybrid delivery configurations through micro-partnerships is the route taken by many African urban authorities to 'regularise' the informal economy of services (Jaglin 2016).

This background explains why the co-production of services is mainly documented in the context of urban regularisation of poor and insecure neighbourhoods (Baron and Bonnassieux 2013; Moretto 2010; Naulet, Gilquin, and Leyronas 2014). As a form of participatory engineering, it arises from a more general interest in the management of common-pool resources and services as well as in the conditions of emergence and consolidation of norms of cooperation between public operators and citizen organisations at a community scale (Ostrom 1996; Tandler 1997). Some studies highlight the political dimension of co-production (Mitlin 2008), or the spatial and political integration brought about by institutionalised co-production when it goes together with the recognition and regularisation of illegal neighbourhoods (Jaglin 2005; Moretto 2010, 2014), while others emphasise the ‘subversive’ power of co-production when it requires interactions which, far from being collaborative, are instead ‘tense and riddled with power asymmetries and political aspirations, thereby producing uneven and highly contested water service provisioning’ (Ahlers et al. 2014, 2).

The processes we describe as co-production in Medellín are taking place in a significantly different context, since service supply is almost universal and provided by a conventional operator; social condominiums surveyed are formal, and the people live there with a legal status. Co-production is therefore neither about extending incomplete and failing public provision, nor developing a participatory way of jointly producing services, let alone sharing strategic decisions with users. Nevertheless, consumers receiving services from EPM need to incorporate new rules while the utility also needs to adapt to these new consumers: in that sense, co-production refers to a process having similarities with what, for instance, Jeannot defines as a co-produced service in France, in which users are involved in the definition of the ‘actual’ rules that govern the service daily (Jeannot 1998). It also bears similarities with what Verschuere *et al.* call co-management, ‘meaning that non-governmental actors have a say in the design of the service, or put time or other resources (e.g. money, skills, expertise) in the delivery of public services’ (2012, 1086). In Medellín, it refers to a non-formalised (and non-institutionalised) cooperation between the residents and EPM, focusing on routine management operations (connection/disconnection, metering of consumption, billing, aftersales service) relating to the provision of individual services (at household scale) and collective services (at the scale of social condominiums). It is therefore an example of ‘consumer co-production’ (Osborne and Strokosch 2013), with a character that is ‘undefined, informal, and renegotiated almost continuously’ (Joshi and Moore 2004, 40), of which we scrutinise the retroactive learning effects both on household consumption practices and on EPM’s operations, thereby adapting the service delivery scheme through modest adjustments.

The hypothesis put forward in this article is that the frictions caused by the residents’ difficulty in adapting to the socio-economic, cultural and cognitive frameworks that constitute the urban modernisation project engender forms of service co-production that ultimately strengthen the utility’s capacity to extend and adapt its delivery model while enhancing the quality of services, which is one outcome identified in the literature (Duque Gómez 2015; Verschuere, Brandsen, and Pestoff 2012). However, our surveys do not show other expected outcomes

often outlined in literatures situating 'co-production as a normative alternative to prevailing funding or structural models used to deliver public service' (Osborne and Stokosch 2013, S33). In the social condominiums surveyed, co-production is neither something claimed by the residents nor sought by the operator; it is rather a pragmatic outcome of learning to negotiate the sharp edges of a mutual adaptation. Transforming the model of supply and placing the inhabitants at the heart of a more democratic decision-making process are not expressed in explicit requests. As in other cities of the South (Criqui 2015; Pilo' 2015), households' consent to EPM model is primarily an expression of their will to participate in a threefold movement: of formalisation (of residential statuses and modes of access to services), of extension of individual social benefits associated with homeownership and of urban integration through the regularisation of service delivery (Jaglin 2016). Co-production is thus driven by a mutual desire for the gradual establishment of rules that maintain long-term service delivery in a context where the users and the provider do not, in principle, share the same technical culture or the same representations of urban 'modernity'.

Under this definition, the co-production of services fits within a particular temporal scheme: associated with regularisation processes, it tends to not only regress to 'lighter' forms as inhabitants get used to the urban norm of modernity, but also re-emerge in the event of sudden changes in services (new technical systems, change of operator, institutional reforms...) or in the conditions of residents (rehousing, impoverishment...). The formal and norm-based framework of service supply in Ciudadela requires a two-way domestication process that is neither smooth nor instantaneous, and co-production supports this transition: it is neither an end in itself nor an idealised issue of participation or 'empowerment'. Its purpose is collaborative learning and the marginal adjustment of shared and acceptable rules for the day-to-day management of services in social condominiums. Coupled with and subordinate to the urban modernisation project, the purpose of co-production is less to promote participatory democracy than to boost the effectiveness of public services and facilitate the urban integration of a heterogeneous citizenry.

2.2. *Ciudadela Nuevo Occidente: our fieldwork location*

The construction of Ciudadela Nuevo Occidente goes back to the early 2000s, with the Plan Parcial Pajarito project (2002, reviewed in 2012), which plans the development of one of the last remaining areas of unbuilt land on the northwest side of Medellín. This former rural area was earmarked for social housing in order to remedy a significant housing shortage³ going back several decades and exacerbated by the need to rehouse some of the inhabitants of districts where urban and infrastructure projects had been carried out as part of the 'transformation' of the city. This sector, built on the model of big apartment building estates for first-time buyers, is ultimately intended to house between 110,000 and 150,000 people⁴ (Plan Parcial Pajarito, 2012). It accounts for a significant proportion of local housing policy implementations and of the national policy for '100,000 free homes'.⁵ The first dwellings were delivered in 2006,

and construction work is still in progress.⁶ This sector is divided into 18 sets of tower blocks (*urbanizaciones*), each containing between 42 and 86 apartments, generally seven floors in height. The residential services in these buildings are provided by the EPM, the municipal multi-utility firm (water, sewerage, electricity, gas and telecoms (through its subsidiary company UNE)) and the main service provider in the metropolitan region. It transfers to the municipality (its sole owner) at least 30% of its annual benefits, allocated to social investment programmes (public amenities, educational and health programmes, etc.). Medellín's mayor presides the company's board and chooses the board's members and the company's CEO.

The apartments, measuring 42–45 m², are delivered with the necessary installations for all residential services: water, sewerage, gas, telephone and Internet. However, only water, sewerage and electricity connections are active when the apartment is delivered, with the connection costs being included in total construction costs. The gas installation is in place, but households have to pay the connection costs directly to the supplier (financed over 36 or 48 months) if they wish to activate the service. The same is true for telecommunications. In addition, the social housing blocks also receive bills for drinking water, sewerage and electricity services for consumption in the communal areas.⁷

While the construction of this district represents a pragmatic response to housing shortage, it has multiple consequences for the households and institutions involved in its day-to-day management. For the former, the sense of security linked with homeownership is quickly counterbalanced by a sense of geographical exclusion and isolation, reinforced by the lack of amenities, shops and job opportunities. In response, many households have converted part of their apartments into moneymaking premises (workshop, mini market, hairdresser, bar, recycling material storage, etc.). This 'informality' is one of a series of learning processes through which households adjust income to expenditure in this new environment, their consumption practices and billing in 'modern' dwellings, interactions with neighbours, in the quest for temporary or more lasting solutions. For the latter, we could at least name two main consequences. The first one is having to manage an ex-centred⁸ and highly dense area, with important needs in terms of urban amenities (education, health, transports, economic activities, etc.) that were insufficiently taken into consideration by the urban project and its building schedule (not enough classrooms were ready on time, health facilities were constructed 8 years after the first apartments were delivered). The second one is having to face conflicts related to the transposition of the co-ownership legal frame to an inexperienced and not always consenting community. This has a direct impact on service delivery, as it will be developed further.

There are two mechanisms by which households move to Ciudadela⁹: one is by rehousing after expropriation associated with an urban development operation (22% of the households interviewed) or a de-urbanisation of high-risk areas¹⁰ (15% of the households interviewed); the other by allocation to housing benefit recipients who have signed up with family service funds (19% of the households interviewed) or as beneficiaries of local and national social programmes (44% of the households interviewed) for low-income households¹¹ or households

classified as displaced by armed conflict. These different residential pathways have implications for the way households appropriate their homes and their new living environment: among the relocated populations, some have to face paying bills for residential services for the first time; almost all the inhabitants 'discover' the constraints of apartment life (limited space, proximity of neighbours, impossibility of changing accommodation conditions) and the obligations associated with the status of owner and co-owner, which include paying the bills for the communal areas of the building.

2.3. Study methodology

In a city where access to services is almost universal according to local statistics (Encuesta de Calidad de Vida 2013), and where service delivery is based on a highly stabilised commercial and legal model, the case of Ciudadela allows us to analyse how substantial changes on living conditions affect this apparent stability. The field study¹² sought to identify and analyse the processes contributing to the different levels of adjustment needed to reconcile individual situations (material, financial, cognitive and cultural) with the objectives of the political modernisation project, for which service delivery plays an important role. To do this, we chose to observe the difficulties, tensions and conflicts encountered by households in their use of residential services after settlement in a social housing apartment, with attention to three levels: the domestic residential unit, the condominium, the service operator EPM.

The household surveys required a particular approach.¹³ Contact was first established with activist community leaders working to draw the authorities' attention to the situation in Ciudadela. They enabled us to attend internal meetings among building leaders, meetings with institutional representatives and a variety of meetings between inhabitants. These meetings were essential to understanding the problems facing the inhabitants and institutions, and to observing some of the processes adopted to try to develop appropriate solutions. Semi-directive interviews with building leaders (12) and households (27) were then employed to explore the individual and collective experiences of these adaptation processes. Institutional interviews with town hall officials and employees of the service provider (EPM) rounded off these approaches, by soliciting the views of the institutional actors.

3. Residential services: learning about 'regular' urban life while juggling with commercial measures

The services are very important, because no one can live without water, and in any case if you let the bills accumulate, you have to pay interest and penalties! It's only now that I realise that it is very important to pay for the services. It was starting to be counterproductive, because since we didn't have individual bills I almost wasn't given an apartment. [. . .] [At the time of rehousing] they [the municipality] stopped paying the rent for people who had never paid for their services and had had their services cut off, and they were not allocated a home. In any case, we have to pay, because if no one pays the company won't be able to operate anymore and we'll find ourselves without a service provider! [. . .] there are a lot of people who have

left here, who have abandoned their apartment and put it up for rent, because they didn't have the means to pay. EPM sent somebody to educate people, because they have a lot of problems paying. (Female resident of El Tirol, rehoused from Sinaí, interviewed in May 2013)

Service delivery in Ciudadela entails three relative novelties for households: connection, along with metered payment; new, less subsidised prices; and a bigger range of services included in the residential package. In this part, we examine how households adapt their practices to their new living conditions through a learning process that supposes their capacity to understand and make their service delivery rules. This results in a first type of co-production that relates to the bypass of commercial rules, and results in the perpetuation and normalisation of 'specific' or 'exceptional' measures.

3.1. Facing conventional multiservice delivery: a learning process

Households have experienced different kinds of access to services before coming to Ciudadela: from self-built networks to conventional connections, including along the way nonconventional systems such as *pilas públicas*¹⁴ or 'community aqueducts' (Table 1). The move to Ciudadela represented for some of them a 'forced' shift from informal to conventional access, leading to new types of relations with service consumption and with the provider. One former inhabitant of the informal district of Vallejuelos, who lives on the Las Flores estate (interviewed in April 2013), gave us her account of the change: 'I wasn't used to paying! It was at an [information] meeting that they told us that here we have to respond responsibly, it's not like where we used to live.' This means learning to manage money differently:

We knew that for the services, we would have to pay, that it's not like at Oasis. [. . .] I have paid the bills with the money I won playing 'chance' [lottery] and by selling a piece of jewellery. I pay for the services even if I have to go hungry. I keep my money for the services, my daughter gives me some to pay for groceries. (Residents of La Cascada, a household relocated from El Oasis, Moravia. Interviewed in April 2013)

Furthermore, being billed for actual consumption is also a novelty for half the households interviewed (52%).

Table 1. Ciudadela: regularisation and uniformisation of residential connections.

	Type of connection in previous dwelling					Connection in Ciudadela
	Informal	<i>Pila pública</i>	Conventional	Shared conventional	None	Conventional
Electricity	5	6	12	4	0	27
Water	9	3	11	4	0	27
Gas	0	0	6	0	21	27
Telephone	0	0	16	0	11	26
Internet	0	0	2	0	25	15

In Moravia, EPM made us pay a flat fee and not for actual consumption. What we were interested in was the average and the flat fee, not our consumption. EPM would come and count how many people lived in the house, and charged us on that basis. That way, we had no disconnection problems [service suspended for non-payment]. But here we know that we have to find the money to pay for the services. We have to do everything we can, but it's more difficult because it's more expensive. (Residents of La Huerta, former inhabitants of El Morro, Moravia, Interviewed in May 2013)

In addition to this, households have to manage a broadening of the range of residential services (provided by a single company and generally combined in a single bill, except for telecommunications) and cope with the reduction in subsidies, which are based on the socio-economic strata system. This system classifies housing into six categories (strata), according to the physical characteristics of the building (materials, communal spaces) and the neighbourhood (infrastructures and urban amenities). Roughly, as shown in [Table 2](#), households living in strata 1 to 3 housing beneficiaries from subsidies, applied in the form of discounts on the basic prices below the 'subsistence consumption' threshold defined by the government. In contrast, households living in strata 5 and 6 pay a surcharge on the real price for their whole consumption that goes into the equalisation funds.

Because the physical conditions of the accommodation and facilities in Ciudadela are better than those in their previous location, 52% of the households interviewed undergo a 'level increase'. While most of the households interviewed expressed a wish to keep up-to-date with their bill payments, they also described the problems: according to the accounts given, 63% of the households had encountered payment difficulties since settling in Ciudadela and had been obliged to pay late, to put off other spending or to borrow money, whereas only a third had experienced similar difficulties in their previous accommodation.

This broad spectrum of services and 'regrading' contribute to households' greater expenditure, at a time when they have to assume higher costs on housing (home loans¹⁵ and property taxes), and household revenues and benefits are falling (lack of local economic tissue, the need to use transportation to find an economic activity). If households claim their willingness to respect these new service delivery conditions, this doesn't happen submissively. As we will see it on the following sections, households go through a process of individual appropriation of commercial conditions.

Table 2. Subsidies for residential services based on socio-economic strata.

	Electricity*	Water and sewerage**	Gas**
Strata 1	-60%	-60%	-50% *
Strata 2	-50%	-40%	-37% *
Strata 3	-15%	-15%	Real price
Strata 4	Real price	Real price	Real price
Strata 5	+20%	+50%	+20%
Strata 6	+20%	+60%	+20%

Note: Subsidy in the form of a discount on the real price up to a basic consumption threshold of 130 kWh for electricity and 20 m³ for water and gas. Consumption above this threshold is billed at the real price.

+ Contribution, a surcharge on the real price that goes into the equalisation funds that finance the subsidies.

* No fixed charge.

** Subsidy set by the municipal councils, can vary from year to year. Water and gas price rates applied by EPM for the city of Medellín in February 2015.

3.2. From exceptional measures to day-to-day commercial arrangements: a first level of co-production

In order to face these changes and to meet their obligations as clients (i.e. paying their bills), households have to understand the rules imposed by the EPM. A learning process takes place through experimentation and experience transfer between neighbours. This process allows households to balance service delivery rules with their own needs and constraints, making some exceptional measures become routine, which we claim is a way of co-production. Our investigations identified two main categories.

In the first, households aim to regain their capacity to make their own choices and designate their spending priorities, as they (do their best to) continue to meet their paying obligations. In a context where connection to all services is imposed, households introduce priorities and selective connection/disconnection practices. Some choose to cancel service supply contracts or to let the service they consider less essential be 'cut off', sometimes letting the arrears build up until they are disconnected (after two consecutive unpaid bills). This is mainly true for telecommunications services and gas, which are seen as low priority.

In the second, households seek to manage their budget, adopting their own paying rhythm, coping with deadlines and other commercial measures. In order to meet their needs (groceries, housing, transport, education...) and ensure their capacity to pay their bills, households learn to juggle with payment deadlines. This allows them to report expenditures from one month to the other, according to their priorities. So we find that 41% of the households interviewed build up two months of arrears,¹⁶ during which they focus on other spending, even if it means having to make an additional effort to pay off their debt. Similarly, 41% pay a few days late, often when they receive the second monthly wage, with the penalty of paying interest on the arrears.¹⁷ Some households, however, use non-payment to apply for a prepay electricity meter.¹⁸ Households see prepay meters as a way to control their spending and make their money go further. These attempts are not always successful but, even when they end in a return to informal

connection, they reflect an underlying wish to become part of the norm, at least in the first instance.

These juggling acts show that household budgets are under pressure and that paying for services gives rise to various tactics for bypassing the commercial rules, depending on how they are understood by households. The households in Ciudadela therefore demonstrate a gradual and pragmatic adaptation to their new living environment, and to the new rules that regulate it. One main conclusion can be made so far: co-production is related to a reciprocal learning process, by which households acquire knowledge to control and prioritise EPM's service delivery rules. In doing so, they are not directly involved in the delivery of the services, but they contribute to creating the conditions for it.

4. Learning about co-ownership and communal services in condominiums

The second level we have analysed is the condominium, where co-production leads to collective arrangements about the distribution of responsibilities related to service delivery in communal areas. When they become owners of their apartments, households also become co-owners of a building, something none of the households in the sample had previously experienced. Despite the information given by the Medellín Housing Institute (ISVIMED) and the family welfare funds during the housing allocation procedure, many households were not given sufficient information and did not understand their collective obligations as co-owners.¹⁹ For them, the urban regularisation embodied in the move to Ciudadela very quickly led to inflated new obligations and expenditure, which included paying the bills for water, sewerage and electricity for the communal areas, as well as the building maintenance costs.

The new residents are therefore required to assume collective responsibilities that demand a preliminary understanding of the collective issues and a minimum of consensus around shared rules of occupancy and management for communal areas and assets. Co-owners are supposed to build an administrative structure to cope with these new responsibilities. Certain residents, the so-called 'building leaders',²⁰ have become dominant in condominium management, while in a few buildings, 'manager teams' have formed and shared out the roles: budget management and payments, resolution of conflicts between neighbours and monitoring of compliance with the building rules (*convivencia* committee) and building maintenance (cleaning, repairs, improvements). In some cases, the building leaders are compensated, but most work free of charge, except for certain activities such as cleaning. With very limited management skills, they are the main agents in the construction of collective norms and the primary interlocutors with the institutions. Some of them have approached the *Comités de Desarrollo y de Control Social de los Servicios Públicos Domiciliarios* (utility service users' associations), which insure a legal and political support to their demands. These associations are directly or more discreetly linked to political parties, and are main bodies for democratic control over EPM. Service billing for communal areas (corridors, stairwells, technical equipment) exposes the building

leaders and co-owners to complex situations: refusal to pay collective service charges, wire-tapping of the electrical connections in the communal areas and meter fiddling. These situations play an essential role in the collective learning of condominium management and co-production of service under specific conditions of sharing responsibilities between co-owners, EPM and local authorities. Below, we describe two situations that illustrate how these tensions and the negotiations and adjustments to which they give rise contribute to the co-production of a more suitable supply of services in collective areas. We will focus on two types of situations regularly handled by the utility in traditional (non-collective housing) districts: tapping and unpaid bills.

4.1. Facing disconnection: social outsourcing or co-responsibility?

As we saw earlier, households have to assume higher charges once they arrive in Ciudadela, leading for some to unpaid bills and service disconnection. Whereas informal reconnection is common in the traditional neighbourhoods (townhouses; small, self-build apartment buildings) and is considered as part of the utility's 'commercial losses', it becomes a sensitive matter in Ciudadela since in social housing buildings these fiddles have an impact on collective costs.

Urban planning standards and the architecture of collective housing provide less opportunity for fiddling. For example, the power poles are not near the apartments, the water pipes are buried and it would be a considerable feat to route a wire or a pipe to the fourth floor illegally without being noticed. The solutions are of two types: fiddling the meters (reopening the valve, 'turning back' the water meter) and direct connection to installations in the communal areas of the building. These two solutions have a direct impact on the collective billing, since a 'general meter' calculates the total amount of services supplied to the building, and the consumption from the communal areas is calculated by deducting the consumption of individual apartments. When a household 'turns back' the water meter, for example, their consumption is not measured by their individual meter, and is therefore reported as part of the communal areas' consumption. Co-owners have to deal with these temporary or semi-temporary fixes put up by households that have been disconnected for non-payment or that try to reduce the amount they pay by tapping on communal areas' connections.

While there are moralistic responses to reconnections or connections to the communal areas, there is also a general awareness of the social difficulties of many families. One woman resident of Chagualón explains that 'there are people who previously paid 5000 pesos for a fraud, but now have to pay bills of 80,000 pesos per month and communal charges. Some of them cannot afford all those expenses' (inhabitant of Chagualón, former resident of Las Margaritas, interviewed in March 2013). In the same way that, according to the accounts given, EPM shows (temporary) tolerance regarding informal connections in certain parts of the city, there are cases where connection to the communal areas is tolerated by the co-owners for households in particularly difficult circumstances, after a death or in the case of single-parent families. This tolerance, always temporary, depends on the building leader's capacity to arouse solidarity between neighbours. It can also be allowed in return for services such

as cleaning the building.

These situations can be understood as a form of social outsourcing, where co-owners face a collective action problem to deal locally with disconnections and illegal connections while, in other housing contexts, they would be considered to be part of EPM's commercial responsibilities. Co-owners become an 'external manager' for EPM, controlling and informing on tapping, and assuming the financial consequences.

4.2. *Negotiating a 'payment culture' with or without legal condominium associations*

According to a former official at Gerencia de Ciudadela (interviewed in January 2012), 80% of conflicts between neighbours are associated with the payment of electricity, water and sewage bills for the communal areas. In some buildings, unpaid communal bills summed up quite high, as is the case with one building in La Cascada where the debt for water bills reached 13 million pesos (leaders' meeting, January 2013). Co-owners' resistance to pay collective bills is based on a mix of mistrust and misunderstanding, as is illustrated by this leader comment: There are people who say that they are not going to pay the communal service charge, because in any case if they lose [the apartment] it doesn't matter, since in any case it didn't belong to them before, and they can move back into a shack. (Building leader, La Cascada, interviewed in April 2013)

In response, the building leaders develop different strategies aiming to promote what they call a 'payment culture': displaying the name of the non-paying household and the amount owed at the entrance to the building, cutting off the electricity or water service to the whole building to put collective pressure on bad payers, exclusion of households from activities such as Christmas parties or building improvements, etc. These social control tactics are partly inspired by the spread of examples from middle-class and wealthy buildings, which the building leaders have access to not only via their personal or professional networks, but also by EPM's commercial practices.

While co-owners struggle to recover unpaid contributions for collective bills, contributions for collective bills, leaders, EPM and ISVIMED agreed after long discussions to "individualise" them, meaning that EPM includes into the individual bill for an apartment a part of the collective bill corresponding to the consumption in the communal areas.²¹ There are, however, two prerequisites for the adoption of this system: the negotiation of the debt with EPM and the creation of a legal condominium association. Such an association is needed for legal pathways to be employed in the event of disputes among co-owners as well as between co-owners and other entities, such as builders or service providers, but not all co-owners agree to create the legal figure.

Individualisation provides a certain degree of 'comfort' for the building leaders and offers a guarantee of collection for EPM, since the households cannot separate the two bills. Nonetheless, not all the building leaders and residents agree on this. Some express a certain mistrust of the billing mechanisms and believe that individualisation limits their collective capacity to monitor consumption and the amounts billed. They explain that it is only when they

receive bills for the communal areas that they can identify any variation in consumption, which may be explained by an informal connection in the corridors or other problems. When the amount billed is divided by 80 apartments, this usually represents slightly under 1000 pesos, an amount that is usually invisible to households, particularly because of fluctuations in service tariffs.

It is therefore largely through informal exchanges between the building leaders that learning takes place, that 'good practices' circulate, that problems and their solutions are discussed and management skills gradually developed. During discussions between the building leaders, sometimes very heated debates take shape around subjects such as the payment of utility bills or the assignment of responsibility for maintenance work. One of the issues that came up several times in the interviews is the following: 'given that they are the ones [the municipality, ISVIMED] who put us here and in this situation, why should it be up to us to deal with all this?' By 'all this', the leaders mean the maintenance of the buildings, the work needed to tackle their rapid deterioration, informal connections by households who cannot or will not pay for services, etc. Through these discussions, the residents question the assignment of responsibilities in urban management, challenge the legitimacy of each stakeholder role and assess their own share of work, calling on the local institutions when the task is beyond their control. The latter, in their turn, try to promote the autonomy of the inhabitants, which begins with the legal establishment of condominium associations. For example, in response to the deterioration of the stairways and corridor railings in a building that had been occupied for a little over six months at the time of our interview, one leader exclaimed: 'as long as we have no legal status [for the condominium] they won't do anything!' (leader of El Tirol, interviewed in April 2013). In March 2013, ISVIMED organised a one-day meeting to promote the creation of condominium associations in all the social housing buildings. The results were mixed: some buildings reached agreements with ISVIMED about repairs and agreed on the payment of their debts with EPM but others expressed 'resistance'.

5. Service delivery in social condominiums: an emerging framework resulting from collective learning

While households and co-owners gradually adapt to their new environment, the utility also adapts its professional routines and practices to the conditions of its activities in the social housing districts. At this level, however, service delivery is also affected by technical and political choices made by actors beyond EPM and households, and who include constructors, local authorities, the housing institute and civic movements. All of them play an essential role in stabilising the emergent arrangements and therefore contribute to the co-production of services by strengthening the utility's capacity to extend and adapt its delivery model while enhancing the quality of services. We will review how these other actors contribute to service co-production at the household and condominium levels.

5.1. *Towards transitional arrangements?*

In their efforts to adapt, households interact in different ways with the utility as well as other institutional players: both dialogue and conflict promote a mutual recognition, and in certain cases lead to shared innovations and reciprocal adaptations. As said earlier, households arriving in Ciudadela then face a reduction in the tariff subsidies, which are calculated according to the socio-economic strata system. This system is based on a national methodology and set of criteria that determine the buildings' classification and directly impact the bills that households have to pay for their service consumptions. This issue was a subject of discussion and negotiation at the time of the rehousing of the former residents of two informal settlements: Moravia and La Iguaá. In order to reach an agreement on the rehousing, the municipality agreed on an exceptional measure on the socio-economic strata methodology. According to this agreement, Moravia and La Iguaá former dwellers benefit of a level 1 strata for 10 years (Decreto n°2586 of 2013), although they live in buildings that are classified as strata 2 or 3. In this case, negotiations between local leaders and the municipality bypassed service delivery regulations, granting a special status to a group of households because of their residential past. This temporary measure smoothens the cost of households' adaptation to their new living conditions while at the same time reducing the risk of non-payment. We suggest that this example emphasises a case of co-production where users were able, through resistance and negotiations, to involve the local political authorities alongside the utility in order to deliver affordable services.

5.2. *From treating to preventing problems in condominiums' collective services*

What both co-owners and EPM have learnt in co-producing services, particularly in the communal areas of social condominiums, and the resulting arrangements have had real impacts on new housing projects. Increased coordination between the constructors, the housing institute or the family service funds (that are legally responsible for the buildings until the co-owners' association is created) and EPM has also been institutionalised.

Rising debts, residents' refusals to pay and also the involvement of political actors and consumer rights organisations have led to the opening of a dialogue between ISVIMED, EPM and the Municipality. The inhabitants' difficulties in adopting the legal framework for condominium management (Act 765 of 2001) made legal avenues difficult: in the absence of official condominium associations, many buildings have remained under the responsibility of ISVIMED, the legal holder of utility bills and unpaid bills, which in the case of water amounted to around €100,000 in 2013 (265 million pesos). In response, in 2012, ISVIMED launched the *Vecinos y amigos* programme to encourage the creation of condominium associations and provide them educational material on their rights and duties. Moreover, to convince the residents, ISVIMED also agreed that, once a condominium association was set up, the building's water bills would be definitively settled and the maintenance and repair works

completed. According to the accounts of the building leaders and the *vocales de control*,²² it was the pressure from EPM, in response to the unsustainable increase in debt, that led to the opening of a stable and serious dialogue between all the stakeholders.

This has resulted in concrete arrangements. Thus, apartment buildings constructed after 2013 are delivered with an 'individualised' billing system, which includes consumption for the communal areas in the individual household bills. In order to reduce the part of collective consumptions, electricity installations in communal areas have also been redesigned in some of the new buildings. For example, those in El Tirol were designed so that the corridor lighting is controlled from inside the apartments: a bulb is located opposite the entrance door of each apartment with a switch inside the home. Each household chooses to illuminate or not the corridor, reducing part of the collective billing but reinforcing individuality in the buildings' day-to-day management. Arrangements have also been made in order to protect meters from tapping.

None of these new arrangements is perfect and most have side effects, but the difficulties encountered in the years following the delivery of the first social housing buildings have served as a learning experience for adapting the conditions of service supply to the socio-economic realities of their occupants. They also highlight the long-standing ability of EPM to successfully meet and accompany urban change: with the *Habilitación Viviendas* programme in the early 1960s, the *Pilas Públicas* system in the 1980s and the prepay meters from 2007. What seems to be new in Ciudadela, compared to the company's responsiveness and capacity for innovation demonstrated in earlier experiences, is the co-production of services in which both the users and the utility agree to get involved in the name of a common vision or at least one shared 'desire' of urban modernity.

6. Conclusion

The process of urban modernisation in Medellín has given rise to numerous analyses of the physical transformations to the city (Blanco and Kobayashi 2009; Brand 2013; Dávila 2012; Echeverri Restrepo and Orsini 2012; Martin and Corrales 2009; Quinchía-Roldán 2013), but the living conditions of inhabitants rehoused into the new social housing districts and their interactions with the municipal utility are less well known. Our case study of Ciudadela Nuevo Occidente highlights both the challenges of a reciprocal 'domestication' and the extent of informal cooperation between the residents and EPM. We suggest that the resulting arrangements are a form of co-production of services supported by a dynamic of formalisation of citizenship and of regularisation of access to networks.

As stressed by Verschuere, Brandsen, and Pestoff (2012), there is still 'conceptual confusion' in studies that refer to co-production and more empirical evidence is needed. By focusing on everyday practice and experience of service delivery, we highlight and discuss in this case study three important aspects of collective action which, in our opinion, contribute to add texture to our

understanding of co-producing services.

First, we find that residential services involve constant negotiations and contestation (about payment of the bill, delays, temporary informal connections, arrears, etc.) that contribute to shaping the service delivery configuration in social housing. Second, we emphasise that enforcing collective binding decisions on condominium inhabitants is not the exclusive capacity of a formal body like EPM but also rests in the hand of neighbours and building leaders who, together with the utilities' professionals and other local actors, help lay the foundation for ownership of services by residents. Third, the ordinary experience of service delivery in Ciudadela shows that cooperative arrangements between the inhabitants and the utility are temporary and that their aim is less the transformation than the regulation of service delivery configurations in social condominiums. Co-production is thus a key process through which ordinary citizens encounter the utility and progressively learn to negotiate their role and responsibilities in the service relationship.

As a process accompanying urban modernisation, co-production of services is therefore a framework to master and negotiate the pace of change and to share adaptation efforts. As such, it is more important for what it makes possible (formalisation of citizenship and regularisation of access to networks) than for what it is in itself (a mechanism of co-management, not intended to be lasting). However, since co-production is still often resisted by regular providers, public and private, the ability to interact with users in alternative ways has in itself a significant potential of institutional innovation. Finally, as shown by the detailed arrangements negotiated in Ciudadela, co-producing services also has an operational efficacy, the political implications of which should not be underestimated, since the incorporation of populations from informal neighbourhoods into the formal city is key to municipal projects of urban modernisation.

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Notes

1. The names given to the municipal programmes since the end of the 1990s illustrate this vision: « Por una ciudad más humana » [For a more humane city] (Juan Gómez Martínez, 1998-2000), « Medellín Competitiva » (Luis Pérez, 2001-2003), « Medellín: Compromiso de toda la ciudadanía » [Medellín: The involvement of all citizens] (Sergio Fajardo, 2004-2007), « Medellín es Solidaria y Competitiva » [Medellín is community minded and competitive] (Alonso Salazar, 2008-2011), « Medellín un hogar para la vida » [Medellín, a home for life] (Anibal Gaviria, 2012-2015).
2. The city's transformation has been celebrated through different international events since 2005.

It has hosted events such as the World Urban Forum (2014), the South American Olympic Games (2010) and the OAS 38th General Assembly (2008). The city has also earned various international awards such as the Innovative City of the Year (2013), the International Sustainable Transport Award (2012), UN-Habitat Scroll of Honour Award (2010), Dubai International Award for Best Practices (2008), etc.

3. The Strategic Housing Plan assessment (PEHMED 2020) estimates the shortage of dwellings at 19% and equality deficit at 10%. This plan provided for the building of 1 million new dwellings between 2005 and 2009, to offset the rise in the shortage. (Alcaldía de Medellín, Instituto Social de Vivienda y Hábitat de Medellín -ISVIMED, Universidad Nacional – Escuela del Hábitat - CEHAP, & Corporación Viva la Ciudadanía, 2011, p. 113).
4. According to Medellín municipality, there were around 46,000 inhabitants in 2014. (<http://www.metrosalud.gov.co/inter/joomla/index.php/noticias/675-alcaldia-de-medellin-entrego-la-primera-fase-de-la-unidad-hospitalaria-nuevo-occidente>, accessed 27 March 2015).
5. The city's housing policy, which has a target of building 15,000 dwellings per year, has been reinforced since 2012 by the national '100,000 free homes' policy, which has resulted in the building of 8489 new homes in Medellín, 30% of them in Ciudadela Nuevo Occidente (<http://www.minvivienda.gov.co/sala-de-prensa/noticias/2014/junio/el-ministerio-de-vivienda-ya-termin%C3%B3-el-81-de-las-viviendas-gratis-a-entregar-en-cundinamarca>, accessed 27 March 2015).
6. According to public data from the Housing Institute (ISVIMED), 2010 apartments divided into five blocks were under construction in October 2014. (<http://www.isvimed.gov.co/evolucion-de-proyectos-en-construccion>, accessed 27 March 2015)
7. The communal areas of the buildings consist of the entrance halls, stairways, shared corridors and service premises, which contain the water tanks and pumps for pumping water to the top floors.
8. In order to face this, the municipality created a structure called *Gerencia de Pajarito* (Pajarito's management unit), whose main roles are to coordinate institutional action within this area and to offer a local assistance to Ciudadela's dwellers on administrative procedures, in order to reduce their need to travel to downtown. However, this structure has not worked on a continuous way, since it is highly dependent on an unstable political will: it has been closed for long periods and the team's turnover is high.
9. There is a lack of statistical data on Ciudadela Nuevo Occidente. The 'quality of life' surveys conducted every year by Medellín Municipality include Ciudadela in the San Cristobal *corregimiento* (rural locality), making it difficult to isolate specific data for the district. In addition, since housing construction is still in progress, it is difficult to make estimates based on data for the San Cristobal sector.
10. High-risk zones are those vulnerable to geophysical threats because of their proximity to watercourses (flood risk) or unstable soil (risk of landslides). There exist different levels of risk, defined in terms of the technical and economic possibility of carrying out mitigation and prevention work. (For more information, see the thesis written by López Peláez 2008.)
11. Not exceeding the two minimum salaries, i.e. 1,232,000 pesos, around €450.
12. Fieldwork was carried out by C. Duque-Gómez as part of a thesis on urban planning. It took place in the course of two stays between December 2011 and June 2013. Thirty-nine interviews were conducted with the inhabitants of Ciudadela Nuevo Occidente and 11 with institutional, local associations and economic actors.
13. The months that preceded the first fieldwork in Ciudadela (fin 2011) were marked by the resurgence of violence between armed groups competing for the control of this territory. For reasons of safety, 'building leaders' were approached to facilitate interviews with the households. While the public order situation grew calmer in 2012, this approach based on intermediaries was maintained, in particular because of people's mistrust of outsiders. This has methodological implications and limits the representativeness of the sample. In addition, the absence of official data on the populations of Ciudadela meant that the individual situations of households were assessed on a more empirical than statistical basis.
14. Pílas públicas are group connections whereby the supplier bills households a flat fee, based on the average consumed by the same category of users. This technical system was adopted by EPM in the 1980s to provide electricity supply in areas where urban development was impossible (informal settlements, unstable ground) and where *Habilitación Viviendas* – the main service expansion policy – could not be applied.
15. The monthly amount paid by households for their apartment varies depending on the household's profile and the reasons of their arrival in Ciudadela: rehousing, beneficiaries of social national and local programmes or family service funds. We encountered difficulties to

gather reliable information on households' revenues through our interviews, making it difficult to develop a thorough analysis on their financial situation and the impact of housing expenses. However, according to the interviews, we can see that, for those who go through family service funds and some beneficiaries of social housing programmes (not rehoused or displaced by armed conflict), the expenses represent in average 30% of their revenues, which vary from 80,000 pesos to 3,000,000 pesos per month (the legal minimum wage in 2013 was 589,500 pesos (306 US\$)). The exact amount of their monthly contribution depends on their start-up capital contribution.

16. There is a deadline for paying bills without incurring a charge, but the supply is only cut off after the second month without payment.
17. In Colombia, monthly wages are paid in two goes, 'per fortnight'. Households often spread out their main spending by, for example, allocating one 'fortnight' to rent and major shopping, and the other to bills and school fees. The households point out that one big difficulty in paying bills is that the deadline often falls between the 26th and 28th of the month, whereas wages are paid on the 1st or 15th of each month.
18. Prepay meters have been adopted by EPM in 2007 as a method of reconnecting households in default. One of the conditions required to apply for the meter is to have arrears on four consecutive bills.
19. According to the law (Act 675 of 2001), co-owners are legally responsible of condominium management. Local authorities (ISVIMED) and housing project developers withdraw from daily management once 51% of the apartments are assigned.
20. Their profiles vary from historically engaged persons that used to be active in their former neighbourhoods (through political parties, religious groups or other types of associations) to 'newcomers' that become active because they are concerned for their patrimony as owners or those who see on their engagement an opportunity to have a future income linked to the management activities. Until 2013, leaders were self-proclaimed or designated by co-owners on an informal basis, but since March 2013 co-owners have to create a legal syndicate, whose members are elected on the annual assemblies.
21. Broadly speaking, in a building with 40 apartments where the communal areas consume 120 kWh of electricity, households are billed 3 kWh at the rate applicable to the communal areas (full price, unsubsidised), in addition to their monthly consumption. The amount equivalent to these 3 kWh is included into the sum to pay and may under no circumstances be paid separately.
22. Representatives of the Comités de Desarrollo y de Control Social de los Servicios Públicos Domiciliarios, the main bodies for democratic control over the operation and quality of service of service supply companies.

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