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A COMPREHENSIVE APPROACH TO URBAN UPGRADING:

The role of space and architecture in Medellin's 'Urban Integral Projects' (PUI).

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ABSTRACT

In recent years the transformation of Medellin has led many urban agencies, media experts and academics to praise its strategy for urban upgrading. Areas of informality are sympathetically incorporated into a citywide transformation process, resulting in a series of interventions aimed at improving rather than eradicating informal settlements. This developed into a much talked about 'comprehensive' approach to urban upgrading, where elements like transport infrastructures, educational facilities and public space would be grouped together to maximize the individual impact of each intervention. This was realized through the Integral Urban Projects, or PUI (Proyectos Urbanos Integrales). The most eye-catching element of these would often be the Library-Parks, a combination of a library building and generous surrounding and indoor spaces for public use. These were developed to address the need for more cultural and education space in poor neighbourhoods and are architecturally designed to a high standard. These aim to be the centre of each community and the focal point for transforming poor neighbourhoods, helping to legitimize parts of the city that were once no go areas. However, the role of the existing street network in the distribution of these interventions is often unclear, or ambiguous at best. As a result, there is a need to understand how these interventions connect to the existing street network, to appreciate if the projects at the heart of this urban strategy are really responding to the existing urban fabric.

Therefore, this paper analyses how Medellin's Library-Parks are spatially distributed throughout the city, examining whether or not there are identifiable spatial patterns that allow them to become the centre of each community. To do this, the relationship between 'to' and 'through' spaces is analysed for each Library-Park location, at both local and meso scales. These results are used to categorize the Library-Parks in terms of how well they are syntactically connected to local and global centres, thus highlighting the Library-Parks that are centrally located. This then allows a selection of Library-Parks to be looked at more closely, so as to illustrate the interrelation between urban ambitions, their architecture and their use of transport infrastructures. This analysis provides an opportunity to discuss their role within Medellin's PUI projects and how this connects to the city's 'comprehensive' urban approach. This paper is about understanding how certain spatial ambitions within the 'comprehensive' approach to upgrading areas of informality were actually realised in Medellin and how this relates to its much-hyped urban discourse – the 'Medellin Model'.

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KEYWORDS

Medellin; Informality; Library-Parks; Comprehensive Urban Upgrading.

1. INTRODUCTION: THE URBAN STRATEGY OF MEDELLÍN

Cities in Latin America grew exponentially in the first half of the 20th century, due to intense industrialization and rural migration (Echeverri and Orsini 2010, 148). This growth resulted in many urban issues, particularly a widespread informal growth (Fiori, Riley, and Ramirez 2000; Brakarz, Greene, and Rojas 2002). In general, these informal areas lack basic infrastructure and correspond to the most violent places in the cities (Echeverri and Orsini 2010, 131). The Latin-American governments' first attempt to resolve these problems was to reallocate the urban poor to the edges of the cities, using coercive force as their mean to eradicate urban informality (Echeverri and Orsini 2010, 136). However, the last quarter of the 20th century saw the emergence of a new strategy: that of the improvement (or 'upgrading') of the existing poor urban settlements (Turner 1972; Turner 1976; Fiori, Riley, and Ramirez 2000; Brakarz, Greene, and Rojas 2002; Echeverri and Orsini 2010, 136). Medellín is considered by many urban agencies, media experts and academics as a successful case of the 'urban upgrading' strategy.

Echeverri and Orsini (2010) highlight that the shift of planning strategy – from coercive actions that aimed to reallocate inhabitants of poor areas, to the improvement or 'upgrading' of these areas – is one of the reasons for the success of the Medellín Model. The authors explain that the coercive strategies were inefficient because they did not address the origin of the problem. Governments spent time and public resources in repressive actions that were incapable of providing housing and infrastructure for the population, or including these communities within the formal city. Echeverri and Orsini (2010) posit that the 'urban upgrading' strategy is opposed to the 'coercive' ones as it sees the urban informality as a solution, rather than a problem. This fundamental shift in how to approach urban informality was originally proposed by Turner (1972; 1976). His numerous contributions as to how governments, social agencies, public and architects provided the ground to the formulation of the 'urban upgrading' project, which should focus therefore on the (participative) provision of infrastructures, buildings and programmes that could improve, rather than eradicate, urban informality.

Among the main strategies utilised in the project of 'urban and social upgrading' in Medellín, one may include: firstly, a transport strategy, with the implementation of the 'Metrocables' (aerial cable-cars), which enabled access to the main metro line to populations of underprivileged areas of the city. Secondly, the construction of social housing projects in the same neighbourhoods. Thirdly, public libraries of 'great architectural impact'[1] were built (namely the Library-Parks Project), which offered a wide range of services to the surrounding communities. Fourthly, the programme of urban upgrade included the renovation of schools and other public facilities. A fifth and last strategy refers to the urban public space renovation, connecting all projects so as to expose the integration of investments. Moreover, the projects in Medellín are referred to follow a strategy of urban renewal named 'urban acupuncture', which promotes the idea that an urban area can be entirely affected by small, but precise, operations in very specific locations (Peña Gallego 2011). The interventions were linked administratively by the "Proyectos Urbanos Integrales" ('Integral Urban Projects') and coordinated by the 'Company of Urban Development' ('Empresa de Desarollo Urbano', EDU), which is a state-led institution.

The most eye-catching element of these would often be the Library-Parks, a combination of a library building and generous surrounding and indoor spaces for public use. These were developed to address the need for more cultural and education space in poor neighbourhoods and are architecturally designed to a high standard. These aim to be the centre of each community and the focal point for transforming poor neighbourhoods, helping to legitimize parts of the city that were once no go areas. However, the role of the existing street network in the distribution of these interventions is often unclear, or ambiguous at best. As a result,

1 One of the mayors of Medellín emphasized the importance of architectural quality in these projects, formulating that their aim was "to activate the power aesthetics as a motor for social change" (Salazar apud Brand and Dávila 2013).

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there is a need to understand how these interventions connect to the existing street network, to understand if the projects at the heart of this urban strategy are really responding to the existing urban fabric.

Therefore, this paper analyses how Medellin's Library-Parks are spatially distributed throughout the city, examining whether or not there are identifiable spatial patterns that allow them to become the centre of each community. To do this, the relationship between 'to' and 'through' spaces is analysed for each Library-Park location, at both local and meso scales. These results are used to categorize the Library-Parks in terms of how well they are syntactically connected to local and global centres, thus highlighting the Library-Parks that are centrally located. This then allows a selection of Library-Parks to be looked at more closely, so as to illustrate the interrelation between urban ambitions, their architecture and their use of transport infrastructures. This analysis provides an opportunity to discuss their role within Medellin's PUI projects and how this connects to the city's 'comprehensive' urban approach. This paper is about understanding how certain spatial ambitions within the 'comprehensive' approach to upgrading areas of informality were actually realised in Medellin and how this relates to its much-hyped urban discourse – the 'Medellin Model'.

2. THE PROJECT OF LIBRARY-PARKS

The 'Library-Parks' are public facilities that were built to foster educational, cultural and social practices of their surrounding neighbourhoods (Peña Gallego 2011; Rodríguez, Valencia, and Arias 2013), as well as act as local centres of 'community encounter' (Figures 1 and 2). In fact, the organisers of the 'Library-Parks Project' claim that 'co-inhabitation' is the *raison d'être* of these buildings (Fajardo Valderrama 2007; Montoya 2014). Considering that the Library-Parks are situated in neighbourhoods that are historically and culturally developed through incremental growth and self-management (Arciniegas 2014), a first question that arises is how these two conditions are manifested in the Library-Parks, particularly in relation to the organisation of their spaces. The idea of knowledge is embedded in libraries (Forgan 1986; Markus 1993; Koch 2004) through the organisation of architectural space and access to informational content. Similarly, we discuss elsewhere how collective values are part of the structuring of spatial and social relations in public library buildings (Capillé and Psarra 2014). In regards to the particular case of Medellín's Library-Parks, we developed a process to capture and describe how their interior morphology frames collective use so as to embed significant political roles (Capillé 2016; 2017). In the present paper, we aim to expand this argument, discussing the social potentials that emerge from these libraries' position in the urban grid.

All Library-Parks' designs were winning schemes of open international architectural competitions (Montoya 2014). The organisers of the Project of Library-Parks (Montoya 2014; Empresa de Desarollo Urbano 2014) explain that the competitions were open with the intention to endorse the participatory character of the construction of these facilities. The brief presented for the competitions requested a "building for multi-services, library, classes for adult qualification, exhibition room, administration spaces, and auditorium" (Empresa de Desarollo Urbano 2014). The brief also emphasised the social importance of these facilities. Beyond the 'mere' function of a library (to organise and provide access to a collection of books), these buildings have the role to strengthen community values and provide spaces for emergence of socialisation based on informal interactions (Montoya 2014). This aspect was fundamental for the creation of the Library-Parks, in the view of the organisers of the Project, and it was strongly associated with these buildings' provision of public spaces, which integrates them with their surrounding urban flows.

Peña Gallego (2011) explains that the Library-Parks are obliged by law[2] to provide a number basic of services, for example: direct access and external lending of books, foster education of users, improve literacy, educate for 'digital literacy', access to the internet, etc.. In addition to these basic services, the libraries also provide complementary ones, for example: they host plays, exhibitions, fairs and workshops, they have a cafe and provide spaces for children to play.

2   Law 1379/2010, article 20.

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The Project is part of a greater Programme of digitally connected libraries ('Red de Bibliotecas'[3] and 'Medellín Digital'[4]), which offers open access to a wide range of resources online, from books, to videos and other forms of digital content. In this sense, the Library-Parks can be considered as integrated within a digital programme.

Aside this 'digital integration', the libraries are also spatially integrated in their urban contexts. The Library-Parks are linked administratively *and spatially* by the "Proyectos Urbanos Integrales" ('Integral Urban Projects'). In some cases (particularly España Library-Park, Figure 2a), the library buildings are surrounded by other interventions of the Project of Urban Upgrading (e.g. schools, cable-car stations, new public spaces, etc.). Moreover, and as we mentioned above, the projects in Medellín are referred to follow a strategy of urban renewal called 'urban acupuncture', which promotes the idea that an urban area can be entirely affected by small, but precise, operations in very specific locations (Peña Gallego 2011). In other words, their 'urban impact' would expand to areas that are distant to their specific locations.

In this sense, the libraries acquire a significant political role beyond their educational agendas that stimulate appropriation and participation (Capillé 2017). These buildings would use their urban locations as means to affect an entire community. However, the extent of the 'urban impact' of the Library-Parks' position in the city was not yet analysed in depth. Such an analysis could provide interesting information with regards to placing public architecture in informal environments and to how these buildings are integrated in the existing urban culture. This paper advances a small contribution in this regard, particularly considering the spatial structure of the urban grid as a way to characterise and differentiate the Library-Parks in terms of their urban and political potentials.

a San Javier (2006)
b España (2007)
c La Quintana (2007)
d La Ladera (2007)
e Belén (2008)
f Fernando Botero (2009)
g José Betancur (2011)
h Guayabal (2012)
i Doce de Octubre (2013)

Figure 1 - Map of the location of the Library-Parks in Medellín (black circles) and the lines of Metro and Metrocables (dotted lines) and their stations (black squares).

3 In English, 'Network of Libraries'.
4 In English, literally 'Digital Medellín'.

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Figure 2 - External views of six Library-Parks: (a) San Javier, (b) España, (c) La Ladera, (d) La Quintana, (e) Belén and (f) Fernando Botero. It becomes evident that the libraries express very different architectural styles and morphological types.

3. METHODOLOGY

In order to understand the spatial distribution of Medellin's nine Library-Parks they are each located within a previously developed spatial model of Medellin's metropolitan area (Goodship 2015), Figure 3. Once located within this model a 1000m radius is formed from the centre of each library-park to create a zone of analysis (Figures 7, 8 and 9). This distance represents a reasonable walking distance for user of the library-park, since they are for local use.

Figure 3 - Location of Library-Parks in Medellín within spatial model of metropolitan area. NACH 2000m metric radius.

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Within this zone of analysis, three main spatial measurements are studied. First, Normalised Integration (NAIN) – normalised measurements are used to enable accurate comparison between different locations (Hillier, Yang, and Turner 2012) – this demonstrates the most important 'to' space. Second, Normalised Choice (NACH), this determines the most important 'through' space. Finally, the correlation between 'choice' and 'integration' measurements is examined, since this represents the likeliness of the area having qualities of centrality, which could generate contact (Vaughan, Dhanani, and Griffiths 2013). Each of these measurements will be examined through a range of metric radii to examine the connectivity of each library at different urban scales.

The results from these three measurements will then be used to select three libraries to examine in more detail. This will select the library with the best, the worst and the mid-range results, using the metric radius 2000m. We will then analyse the location of each selected library, highlighting their surrounding amenities and urban fabric. This will enable the final part of the paper to examine how the Library-Parks actually relate to the urban upgrading discourse of Medellin's PUI program.

4. RESULTS

The Library-Parks are generally distributed across the poorest regions of the city, usually within the socioeconomic band of 1, 2 or 3 (figure 4). Colombia's socioeconomic banding is between 1 to 6, with 1 being the lowest and 6 the highest. It is also worth pointing out that the Library-Parks only appear within the municipality of Medellín, not neighbouring municipalities that form the city's metropolitan area. This is a consequence of each municipality being governed separately, even though in recent times the 10 municipalities that form the metropolitan area have spatially merged into one city.

Starting with the 'to' space analysis, when the average NAIN values for each library-park zones is examined, in general each Library-Park has its highest average values at the lowest metric radii, which represents the local scale (Figure 5). This is the urban scale at which the Library-Park is aiming to connect with and have its largest influence within the upgrading process. These average values steadily drop the higher the metric radii increase until their reach 5000m, at which point they plateau.
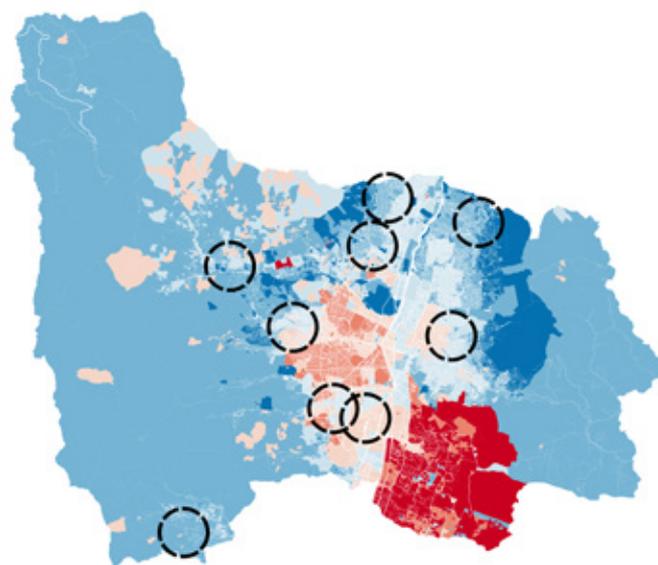

Figure 4 - Location of Library-Parks within Medellin's socioeconomic strata map. Band 1 (blue) represents the lowest band, 6 (red) represents the highest band.

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The Library-Park with the highest average NAIN values throughout is Guayabal, with both Belen and La Ladera also featuring high in the list. This is mainly because these Library-Parks are positioned centrally to the city, so when the analysis measures the whole city, a central location will provide better values to these locations since integration is strongest in the centre of the city. The Library-Parks with the lowest average values are San Cristobal, Espana and Jose Betancur, however whilst San Cristobal and Espana have low values throughout the metric radii, Jose Betancur has high values at low metric radii, indicating strong 'to' space at a local scale, these then rapidly drop as the metric radius increase.

Next, 'through' space is analysed using the average NACH values for each Library-Park. As with the NAIN results, each library generally has its highest average values at the lowest metric radii, between 500m and 750m. These average values steadily drop the higher the metric radii increases. However, unlike the average NAIN values, these are much closer together throughout. In general, the Library-Parks with the highest average NACH values throughout is La Ladera, San Javier and Belen. However, Jose Betancur is generally high on the list until the metric scale of 3500m, when it rapidly drops to one of the lowest. In general the lowest average NACH values throughout is San Cristobal, La Quintana and Doce de Octubre.

Figure 5 - Average NACH and NAIN spatial values.

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These average values indicate that the Library-Parks are usually positioned in the local network and engage with the spatial network at a local scale, which is generally what one would expect for a local library.

Another reach of spatial values worth examining for each Library-Park is the correlation between choice and integration (Figure 6). This measurement traditionally determines how 'strong' the urban centre is for each scale. Hence, with the ambition of the Library-Parks to form a part of strong urban centres for the local community, this correlation is worth exploring.

The INT-CH correlations, as per the previous results, again indicate it is at a local scale that the highest correlations exist, this again drops off the larger the metric radii gets. In general Guayabal has the highest correlations, with both San Cristobal and Jose Betancur showing the next highest correlation, though Jose Betancur has very low correlations at local metric radii. The Library-Parks with the lowest correlations are La Ladera, Belen and Espana. A strong correlation coefficient is usually defined as above 0.7 r/2 (Rowntree 2000), at this size of analysis there are only a small handful of metric radii with this value and all are within Guayabal. However, when the analytical zone is reduced to a 500m radius, the correlation coefficient values increase and four Library-Parks have at least one metric radius with a high correlation. This is an indication that the Library-Parks are centrally positioned at a local scale.
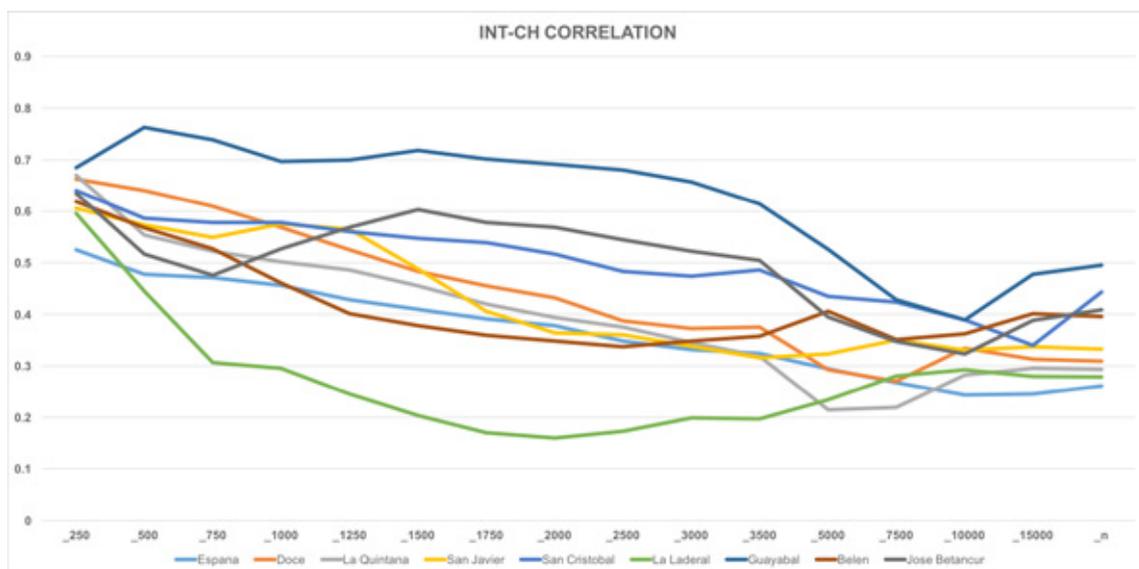

Figure 6 - Choice-Integration Correlations.

While this represents a good basic understanding of each Library-Park, it should be noted that these are the average values for all the segments within an analysed zone, thus this may not provide an accurate spatial analysis for each library. Therefore, as previously mentioned, three libraries are selected from this initial analysis for closer examination. The Library-Park with the highest values throughout is Guayabal, the lowest values are La Ladera and mid-range values are La Quintana. Conveniently, these 3 Library-Parks each represent a different area of the city and all avoid the problems of edge-affect.

4.1 GUAYABAL

Starting with the Library-Park that has the highest spatial values, Guayabal (figure 7), it is very clear that it is well positioned close to important 'through' routes, one of which is the main city highway. These north-south roads provide important routes through the city, as well as the main route in and out the city. As a consequence these are important 'through' spaces at a city scale. However, at a local scale 'through' space also appears positive. This Library-Park also has reasonably high 'to' spaces, with very few low integrated spaces, even though the local airport opposite splits the analysed zone into two.

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In terms of near-by public facilities mapped using data supplied by the municipality, this indicates that 46% of the land within the analysis zone is dedicated to public facilities, however much of this is taken up by the airport. When the airport is removed from the analysis it drops to 16%. The public facility that takes up the most space is sport, then cultural facilities (which the Library-Parks fall in) and thirdly municipal institutions. In terms of the total number of public facilities there are 45, of which education is the highest with 9, then sports with 8, and thirdly community buildings with 7.

With the socioeconomic bandings, the largest area in Guayabal falls within the Colombian socioeconomic band 4, accounting for 77% of land, the next highest is band 3 accounting 22%, then band 1, 2 and 5 account for less than 1%. If we look at land value within this area, 93% of the land is valued above 500,000 Colombian pesos sq/m (1000 Colombian pesos equal US$0.34), with 5% between 400,000 and 500,000 and rest below 400,000. Both land values and socioeconomic banding are high for Medellin, which is most likely a result of its position next the airport, which is increasing the average results. Finally, looking at the morphology of the building heights, we see that 48% of buildings are one storey high, 30% two storeys, 16% three storey and 4% four storeys, the other 2% is five or above storeys.
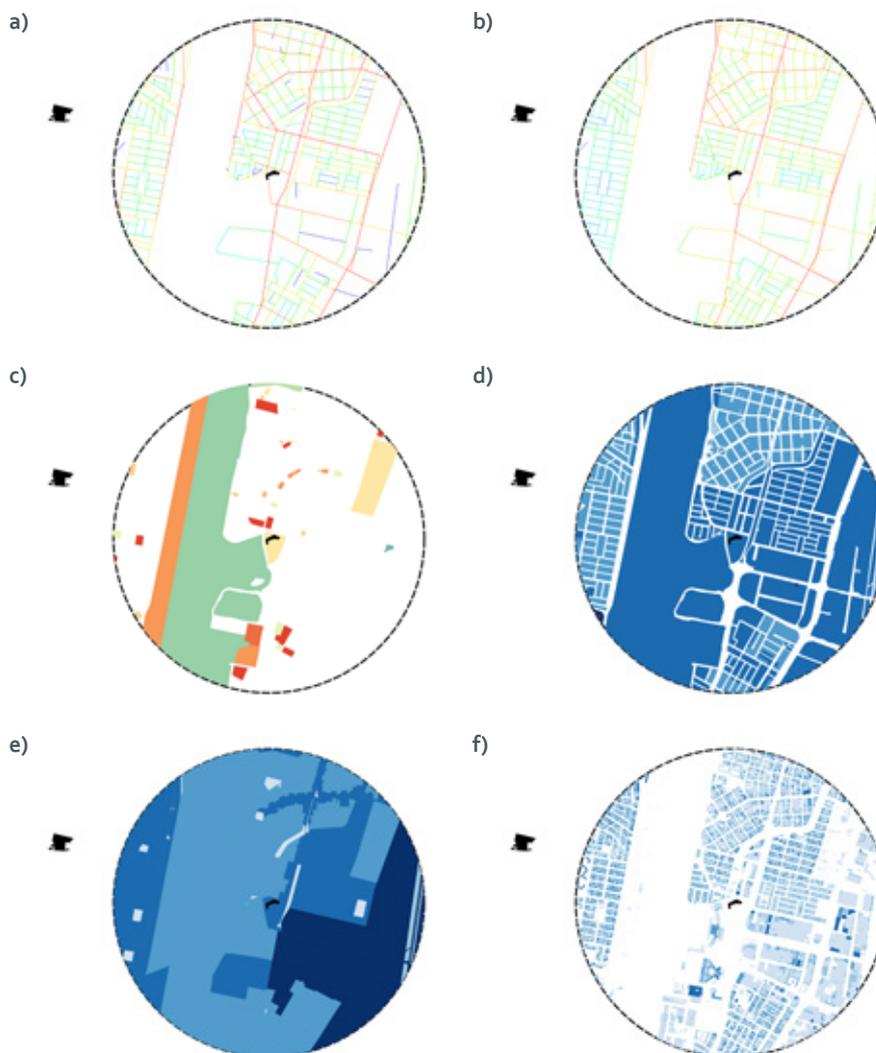

Figure 7 - (a) Guayabal's NACH 2000, (b) Guayabal's NAIN 2000, (c) Guayabal's land use, (d) Guayabal's socioeconomic strata, (e) Guayabal's land value, (f) Guayabal's building heights. Credit of photograph: (Alcadia de Medellín and Empresa de Desarollo Urbano 2015)

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4.2 LA QUINTANA

La Quintana is the library that sat in the middle of the results (figure 8). Similar to Guayabal, it is well positioned next to important 'through' routes, which run west-to-east towards the centre city. Yet there is also useful 'through' routes throughout the metric-radii, and especially at a local scale. However, unlike Guayabal, most of this Library-Park's neighbouring areas do not serve as good 'to' spaces, especially around the peripheral zone of the selected area for analysis, and is most dominant between the metric-radii of 2000 and 5000m. This is a result of the periphery becoming more informal and less connected to the area directly surrounding the Library-Park.
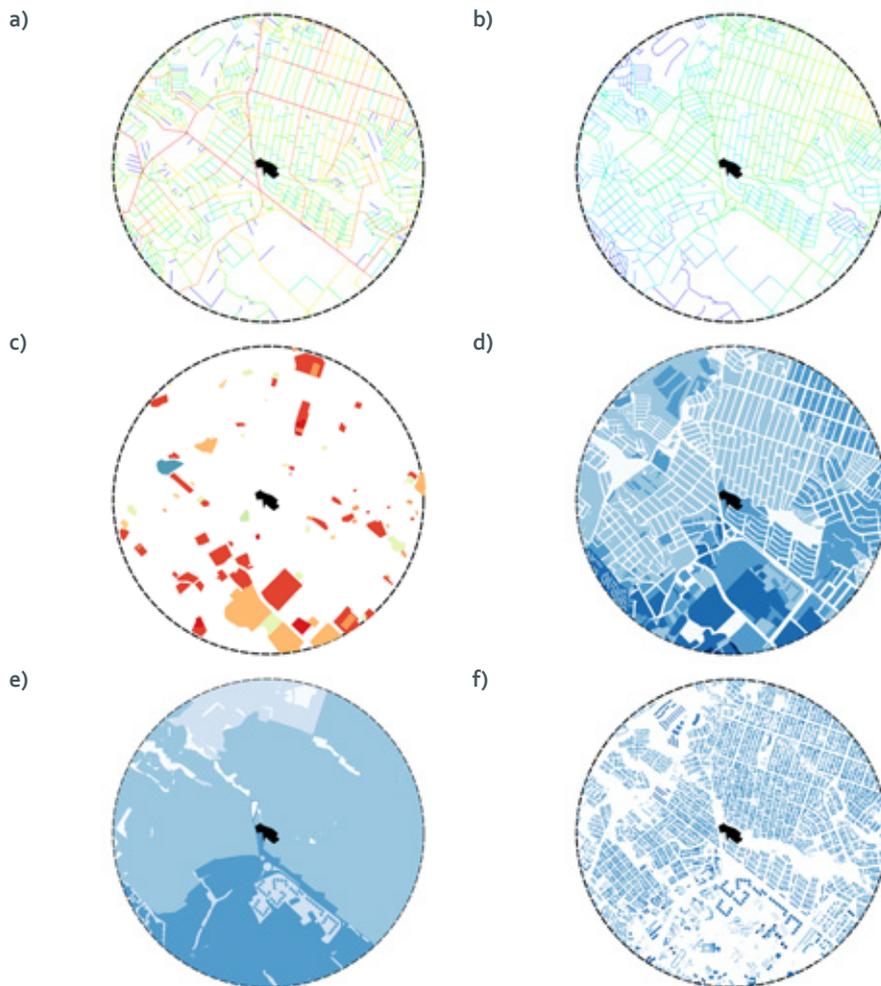

Figure 8 - (a) La Quintana's NACH 2000, (b) La Quintana's NAIN 2000, (c) La Quintana's land use, (d) La Quintana's socioeconomic strata, (e) La Quintana's land value, (f) La Quintana's building heights.

In terms of land use surrounding the library, the results indicate that 14% is dedicated to public facilities. Among these, educational facilities represent 43%, healthcare represents 35% and places to worship represent 8%. There are 93 public facilities in total – more than double of Guayabal's number. With regards to socioeconomic conditions, the largest percentage of land is within band 2 (48%), then band 3 (30%), band 4 (15%) and band 1 (6%). In terms of land-value, the analysis indicates that 41% of the land is valued between 300,000 and 400,000 pesos sq/m, and then 16% of the land is above 500,000 and 15% between 200,000 and 300,00. These two indicators show that this area maybe considered poorer than Guayabal. In regards to the morphology of the building heights, the analysis shows that 36% of the buildings have two storeys, 30% three storeys, 24% one storey and 5% fours storeys, the remaining 5% account for buildings that are five or above storeys.

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4.3 LA LADERA

La Ladera is the Library-Park with the lowest values for 'through' and 'to' movement (figure 9). Its surroundings present reasonable 'through' space, which connects to the city centre. However, the Library-Park itself is set back from these paths, with no direct connection. Similar to the other two selected Library-Parks, surrounding 'through' spaces function at a variety of urban scales. However, the 'to' spaces analysed in this area are affected by the fact that much of this neighbourhood is informal and segregated from the formal areas. Hence, this Library-Park is situated in an informal area that is spatially segregated from other parts of the city.

In terms of near-by facilities, 21% is dedicated to public facilities (97 buildings in total), such as educational buildings and public services (e.g. an energy plant, water storage, fire station, and police stations). In regards to socioeconomic conditions, the largest percentage of land lies within band 3 (58%), followed by band 4 (25%) and band 2 (17%). The land-value analysis show 38% of the land valued less than 100,000 peso sq/m, then 26% of land is valued between 400,000 and 500,000 and 24% below 200,000 and 400,000. This analysed zone represents two very different types of urban space, one informal and the other formal. These contradictory urban form results in hugely differing results, especially with land-values and socioeconomic conditions, and as a result this indicates that La Ladera's neighbouring area is socioeconomically more diverse than La Quintana, for example. In regards to the surrounding morphology, the analysis show that 40% of the buildings have one storey, 31% two storeys, 18% three storeys, 5% four storeys, and 6% is five or above storeys.
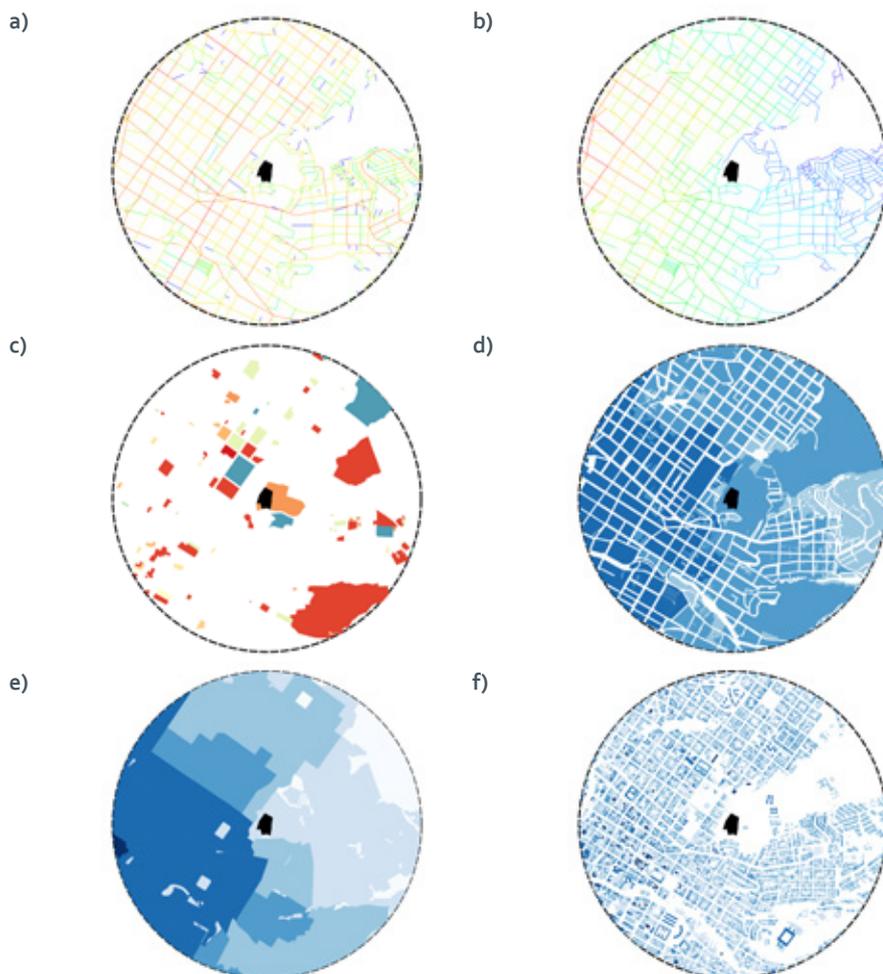

Figure 9 - (a) La Ladera's NACH 2000, (b) La Ladera's NAIN 2000, (c) La Ladera's land use, (d) La Ladera's socioeconomic strata, (e) La Ladera's land value, (f) La Ladera's building heights.

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5. COMPARISON

In general these results show that the three Library-Parks studied have reasonably good access to 'through' spaces (figure 10), both locally within the neighbourhood (travel usually covered by walking) and citywide connection (usually completed using the transport system of Metro, Metrocables and buses). However, the 'to' spaces surrounding each library is less consistent. At Guayabal, integration is reasonably higher due to its location within the formal urban grid and near to the city centre. By contrast, at La Ladera and La Quintana, integration is considerably lower, exposing the separation in the urban grid between formal (integrated) and informal (segregated).

With regards to public facilities, it is clear that these have a larger presence in both La Ladera and La Quintana, each presenting more than double the number of public facilities than Guayabal. In addition, La Ladera and La Quintana have large areas of land with low socioeconomic banding and land values. This could be an indication that the municipality is attempting to create a larger presence within the poorer communities. Finally, in regards to the building heights, the vast majority of these are between one and three storeys, indicating a common profile of urban density.
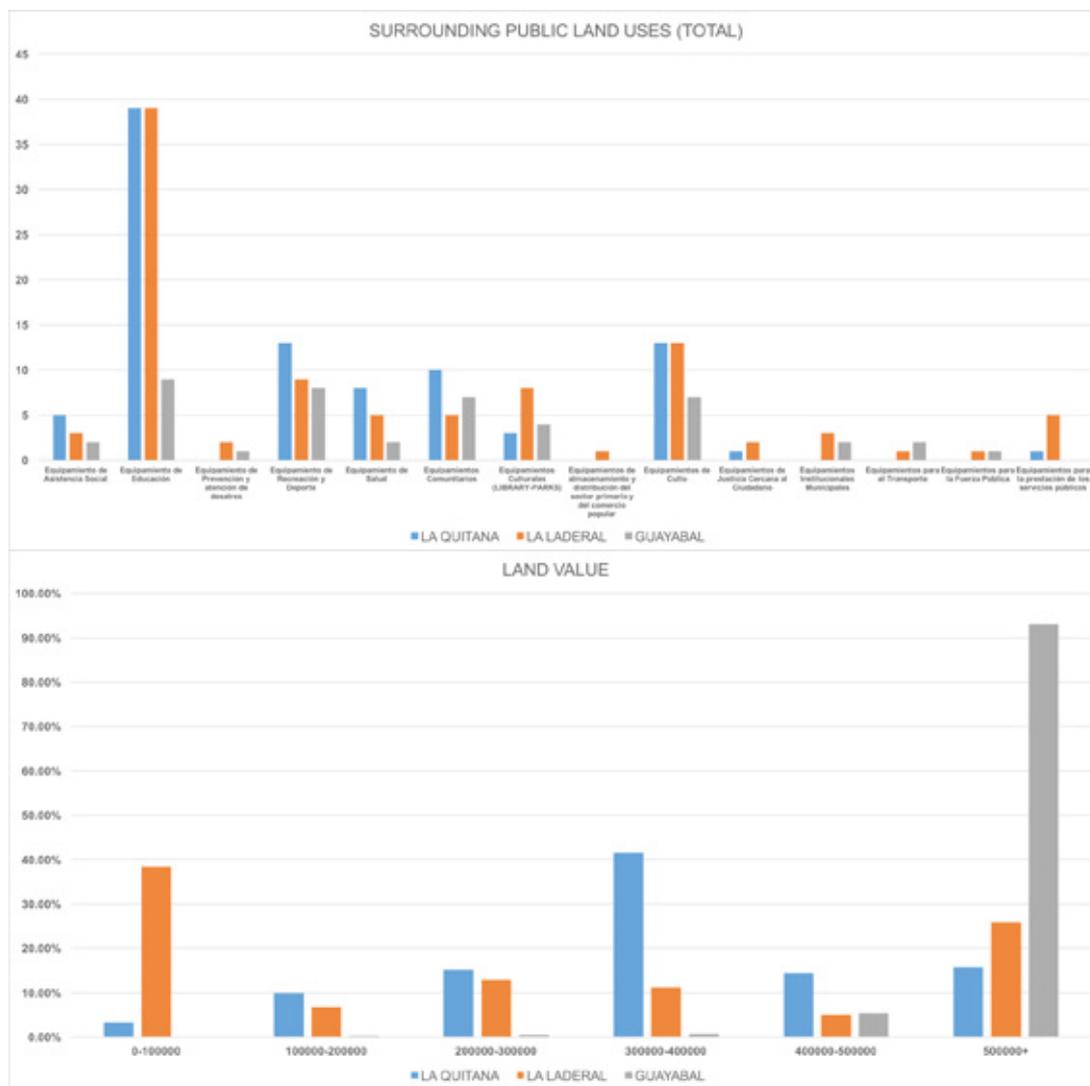

Figure 10 - Comparative results for Guayabal, La Quintana and La Ladera. (a) Surrounding public facilities in total number. (b) Surrounding land value.

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6. DISCUSSION

This analysis investigated the urban distribution of the Library-Parks within Medellín and how they connect to the surrounding urban fabric. This opens up an opportunity to discuss how this distribution connects to the urban discourse related to Medellin's upgrading programme.

Much of this early discourse related to 'Social Urbanism', which was initially '*the main framework for all urban projects, especially those located in the deprived neighbourhoods of the city*' (Calderon 2012). This was supported by the discourse '*of paying off the city's historical debt to the long-abandoned poor sectors*' (Brand 2013). By simply examining the location of the libraries in relation to the socioeconomic map of Medellin, it is clear that the majority of these are positioned within the lowest socioeconomic bands, though a couple – namely, La Quintana and Belen – are in slightly higher bands. Another key element was the 'architectural quality' of these buildings for the poorest communities. The municipal administration spoke of '*building better architecture, which the people can be proud of, which builds the community's self-esteem and sense of belonging*' (Brand 2013). The Library-Parks clearly stand out in their scale, form, materials and colour, and announce state presence worthy of the wealthier sectors of the city. Hence, architecture became a key tool for not only creating high quality environments that citizens can value, but also for enforcing state presence. Yet, these buildings do not just provide state presence or create self esteem for the poorest neighbourhoods, they also provided a variety of social services such as computer and information technology, training courses, cultural activities, spaces for sport and recreation, social programmes, business set-up advice and so on. Therefore, it could be argued that the Library-Parks on their own address the three key fundamentals of the PUI program, "*that whenever there was an urban intervention, in parallel to the physical transformation, there were new social/institutional programs and activities that complemented the physical change*" (Echeverri and Orsini 2010).

Yet, whilst these libraries position within the backdrop of an informal settlement provide a striking image and representation of Medellin's key transformation strategy, they do not reveal the full extent of the PUI program. This was more than just one building, '*it involved shifting substantial public investment to the poorest sectors in the form of infrastructure, public buildings and services, and urban space and environmental improvements*' (Brand 2013). Therefore, whilst the Library-Parks symbolise Medellin's transformation, it was equally important that they function within a series of other public facilities, to promote the idea of inclusion. Calderon (2008) explains that '*the PUI's main strategy is to concentrate in an integral and comprehensive approach all the actions of the municipality, converging resources, projects and programs in a delimited area'.* He further mentions that these '*projects and programs are located in strategic areas of the neighbourhoods and are considered as "magnets" and "detonator" of development in all the other fields*' (ibid.). Consequently, the urban grid surrounding each Library-Park is an extremely important factor, since it has the ability to connect people to these public facilities and achieve the objective of the PUI.

One of the best ways to connect local residents to public facilities, including the Library-Parks, is by positioning these facilities nearby local 'through' routes. Using the spatial measurement of NACH, it is clear that all the library-parks have positioned nearby local 'through' routes, providing good connections to and from the libraries. Yet it is not only at a local level that the Library-Parks are well connected to 'through' spaces. Most are not far from important 'through' spaces at larger urban scales, which provide connections to the city centre. This spatial positioning allows the Library-Parks to be easily accessible for the local residents, allowing natural movement to pass each library, or at least nearby. This was very important for the PUI, as the physical component of this '*aims to improve and construct spaces where people can meet and build a greater sense of community and where the satisfaction of the collective needs such as recreation, culture, education and leisure can be met*' (Calderon 2008). We show that this was achieved by directly connecting the Library-Parks to important 'through' spaces at a local scale.

While strong 'through' space indicate good connections within each neighbourhood, frequently there is weak 'to' space surrounding each library. This is often a result of being located nearby two different urban systems – formal and informal. This is evident at both La Ladera and La

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Quintana, but not Guayabal. The result of which creates weak integration, especially above a very immediate local scale. Yet, whilst it is clear that the Library-Parks are not always positioned in areas of high integration, their location nearby formal neighbourhoods provides the opportunity for other communities to use their facilities. This was at the heart of much of Medellin's urban upgrading program, as it aimed to break down barriers and integrate previously conflicting neighbourhoods. The PUI '*aims at the improvement of the mobility, accessibility and connectivity between different neighbourhoods and the city'* (Calderon 2008), this had the ambition of creating connections between the poorest neighbourhoods and the rest of the city, making residents feel a part of Medellin as a whole. Elsewhere, this has been done using bridges, cable-cars and strategically positioned football pitches, yet this analysis suggests the facilities and open spaces of each Library-Park also provides this opportunity for inclusion.

Furthermore, the analysis indicates that the Library-Parks are easily accessible at a local scale. Yet, because of the often-contradictory urban form, they are not positioned at the centres of each community, but instead on the edge. Nevertheless, this could lead to a positive effect, since their position provides the opportunity to mix different communities, particularly by integrating segregated areas with the local centres of Medellín.

One of the most important elements of the PUI was the introduction of a wide network of public facilities to the poorest neighbourhoods. This aimed to provide a wide variety of opportunities to the poorest citizens in Medellin and improve the credibility and trust towards the municipal institutions. Calderon (2012) explains that "*social and institutional programs and activities aiming at education, culture, sports and recreation and employment reinforced and made active use of the new public spaces and public facilities"*. Among the key cases studied in this paper, we saw that La Ladera has 95 nearby public facilities, La Quintana has 93, and Guayabal has 43. These include facilities for education, sports, community, faith, public services, culture, etc. As has been previously discussed, the areas surrounding La Ladera and La Quintana are deemed significantly less prosperous than Guayabal, hence it is understandable that more public facilities are positioned here, since this was a direct aim of the PUI to target the poorest neighbourhoods. With this the municipality now has a larger presence in these communities, where previously this was not the case. This demonstrates that Medellin's upgrading programme is more extensive than just the captivating architecture of the Library-Parks. Rather, it attempts to introduce a network of public facilities to some of the poorest communities and knits them together with the existing urban grid. This provides spatial coherence to the upgrading projects. At the same time, however, the spatial distribution of Library-Parks and other public facilities provide an entrance for public institutions and state authority, which gradually impose themselves in informal sectors. As Brand explains (2013), the upgrading process has "*lead to the formalisation of things such as electricity and water connections, the legalisation of property holdings and imposition of property taxes, permissions and controls over social events, the inclusion in official business registers, and so on"*. In short, implicit in the Project of Urban Upgrading is the idea that a formal economy controlled by the state constitutes an 'upgraded' version of a culture characterised by informal economy, incremental growth and self-management.

Whilst Medellin's upgrading programme is often symbolised by it iconic statements, such as the Library-Parks or the Metrocables, which help support the discourse of 'social urbanism' and the 'Medellin model', the actual upgrading program is much wider reaching, often going beyond spatial and physical forms by including major – and often debatable –institutional and social changes. Yet, its real strength may have actually been its understanding of the existing urban grid and its abilities to position key interventions in pivotal locations, which could then connect to other public facilities to form a spatially cohesive transformation.

7. CONCLUSION

Most of what is published about Medellin's urban development relies on 'slogans' and 'metaphors' and these often glorify its 'rags to riches' story, using the image of violence and narcotics to capture people's attentions. However, behind all of this rhetoric, there has been the transformation of many of its poorest neighbourhoods. The Library-Parks stand at the

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heart of this transformation and this paper has shown how the existing urban fabric contributes to their success. Firstly, the paper characterises each building based on their spatial location within their neighbourhoods. Secondly, and more importantly, the paper discusses how these characteristics relate to Medellin's upgrading discourse. In particular, we show how the PUI's objectives are materialised in space, highlighting how it works as a framework in which to physically, socially and institutionally transform existing neighbourhoods in Medellín.

Further work can then be done on how the urban conditions we described impact on these facilities' everyday use by the population, shedding light on the question of how public architecture promotes social change, and discussing the ways in which state power is made manifest in informal settlements. In particular, we may now analyse the interrelation between its wider programme, its interior spatial structure, its location within the urban fabric and the symbolic messages it carries.

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