Street-led Citywide Slum Upgrading: connecting the informal and the formal city through area-based planning and infrastructure improvement

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Abstract

This chapter illustrates the street-led citywide slum upgrading approach as the strategy to achieve the social and spatial inclusion of slums and their residents into the city where they are located. The street-led approach draws on the area-based plan, the urban layout design and the street networks. It is argued that this is an incremental development strategy to achieve physical and spatial integration of slums into the nearby district and the city as whole. The practical examples of Rio de Janeiro and São Paulo show the vigorous results of the approach in achieving greater spatial connectivity and physical integration but also unveil the challenges to incorporate slum dwellers into the city social, economic, institutional and city management environment.

Preamble

This chapter focuses on the planning and implementation of streets as the foundation of an area-based plan to trigger urban transformations in slums and informal settlements. Case studies referred to in this article substantiate the argument that the area-based plan[2] not only helps to define the future urban layout of these settlements but also integrates them physically and spatially into the rest of the city by defining the network of streets and patterns of circulation and accessibility to and from the settlements. This is called the street-led slum upgrading strategy, an approach to urban renewal of informal settlements. The consolidation of streets and pathways in the territory is vital for the incremental improvement of infrastructure provision, fostering greater accessibility and laying down the basis for future land tenure regularization. Overall, residents acquire greater accessibility and connectivity to the city and their place of resident are provided with access to infrastructure and basic urban services. It helps to lay down the foundations for the formalization and regularization of these settlements and their full insertion in the urban management systems that govern cities.

The concept and practice of urban renewal and urban revitalization strategies that prevailed in the post-world war period in many European countries gets the shape of slum upgrading and informal settlement regularization strategies in the developing world. These strategies aim to resolve two paramount challenges, on the one hand, the access to basic infrastructure such as water, sewerage and drainage and on the other hand, the formalization of land tenure in favor of present residents.

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[2] An area-based plan is an urban layout plan, also called settlement layout design, that guides the future development of a slum, informal settlement or neighborhood. It physically defines the spatial structure and urban configuration of the settlement. It also includes land-use pattern, land subdivision and the street network, including the indications for demolitions and relocations of buildings and housing units necessary to open new and/or improve existing streets. The area-based plan is the result of a physical planning intervention led by the street network which is essential for the execution of the infrastructure networks, pipes, power lines, drainage, pavement and street addressing and for circulation of people, vehicles and public transport that connects it to the city where it is located.

In order to achieve these objectives, it is fundamental that a settlement layout plan is implemented in order to reverse the process of spatial and residential exclusion of these areas and their residents, connecting the settlements to the rest of the city through the street and the infrastructure networks.

A street-led approach to slum upgrading addresses these challenges in an incremental manner by promoting an urban restructuring strategy that uses streets as the primary physical vector through which water and sewerage pipes, power lines, and drainage systems are laid. Examples from cities in Brazil, Colombia, Venezuela, Argentina and Uruguay demonstrate the strength of this approach. Streets become the common good and vital element to enable the spatial and physical integration of these settlements into the rest of the cities where they are located. In randomly and densely occupied slums, where accessibility and lack of trunk roads are common problems, the street-led approach becomes transformative because it triggers the opening of new streets or requires the improvement and consolidation of existing streets that calls for demolitions of buildings and the resettlement of residents. The approach usually adopts a resettlement strategy that recognizes the rights of residents and relocates them to nearby areas or to locations within the settlements where they live. Thus, the implementation of a street-led approach to slum upgrading will inexorably be associated with resettlement and relocation triggering strong citizen participation in the prioritization of the streets and the future urban layout configuration of their neighborhood.

This article argues with evidences that the development of streets is essential in any slum upgrading intervention, and it draws on UN-Habitat's strategy paper that promotes the street-led approach to urban transformations.[3]

A meticulous analysis of the existing urban configuration, land uses and the identification of the existing patterns of circulation used by residents in slums and informal settlements becomes part and parcel of the urban planning process. This analysis enables strategic spatial planning decisions and supports choices to be made on the selection of streets for improvement and those new ones that are needed to be created and/or widen to facilitate accessibility and the most efficient use of land and infrastructure. This is likely to propel economic activities with positive impacts on the settlement and in the city as a whole. Not mentioning the significant impact on the lives of residents. Land allocation for resettlement and relocation is also another critical element in spatial planning decisions when implementing a street-led slum upgrading strategy.

Slums: Facts and Figures

In its seminal global report[4] launched after the adoption of the Millennium Development Goals-MDGs and the agenda to improve the lives of slum dwellers, UN-Habitat estimated that nearly 1 billion people were living in slums, the majority were in the developing regions which represented 43% of the urban population. Sub-Saharan Africa was the region with the largest proportion of urban population residing in slums (71.9%). This was the first global assessment of slums. If no concerted actions would not be undertaken by governments and the international community, the projections made indicated that by 2033 the population living in slums would increase to 2 billion people. In order to measure progress and monitor the MDG 11/7 on improving the lives of 100 million slum dwellers, the report adopted an international operational definition of slums combining physical and legal dimensions, such as: inadequate access to safe water; inadequate access to sanitation and other infrastructure; poor structural quality of housing; overcrowding; insecure residential status. A monitoring system was put into place to enable the annual report for MDG's.

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[3] Acioly, Claudio (2014). Street-led Citywide Slum Upgrading. Global Urban Lecture. http://unhabitat.org/street-led-city-wide-slum-upgrading-claudio-acioly-un-habitat/; UN-Habitat (2012). Streets as Tools for Urban Transformation in Slums: a street-led approach to citywide slum upgrading. Nairobi: UN-Habitat.
[4] UN-Habitat (2003). The Challenge of Slums. Global Report on Human Settlements 2003. Nairobi: UN-Habitat. London: Earthscan

In 2010, the State of the World Cities Report[5], data suggests that the proportion of the world's urban population living in slums decreased from 46.1% in 1990 to 32.7% in 2010 while in absolute terms the population was increasing. In 2013, UN-Habitat issued the Urban Statistics during the 24th Session of its Governing Council, published in its global report[6] showing that 1 out of 4 people living in urban areas were living in slums in the world with Africa having 1 out of 2 people living in urban areas under these conditions. Estimates provided by UN-Habitat[7] show that the proportion of the urban population living in slums has further decreased to 29.7% in 2014. However, in absolute numbers the total of slum dwellers is increasing. In 2014, over 880 million people lived in slums compared to 791 million in 2000 and 689 million in 1990.[8]

Revisiting the Foundation of the Street-led Slum Upgrading Strategy: the area-based plan

Slums and informal settlements are mostly disconnected from the urban management and planning systems that govern cities. Usually, their residents remain spatially and socially segregated by large. When compared to the rest of the city, these settlements often remain as unplanned enclaves that are poorly serviced by basic infrastructure, lacking streets and public spaces, and compelled to the adversities derived from the lack of connectivity with the city's urban fabric.

During the last 50 years, slum upgrading interventions have addressed these problems in various ways. We identify a historical sequence of interventions moving from improvement of infrastructure towards improvement of infrastructure and land regularization and finally improvement and full urbanistic and spatial integration.

Also, a global research[9] evaluating policies targeting informal settlements and slums that sponsored the Urban Management Programme during the 1990's also revealed four major approaches that illustrate the foundations and evolution in slum upgrading interventions. The first one, the legalization of land tenure focusing on land-use and property regularization. The second, settlement upgrading meant to achieve a rational urban layout pattern and optimal land use process which included re-blocking and densification, with eventual relocation of residents. A third approach with an overly ambitious settlement upgrading aimed at infrastructure provision to overcome years of neglect and poor services provision. And finally, a preventive approach that encompasses an incremental provision of primary infrastructure combined with recognition and incorporation of these settlements into formal systems, accepting a gradual compliance with norms and laws and the progressive formalization of properties and urban restructuring. The area-based plan and the design of the urban layout with its network of streets were intrinsically associated with these approaches.

Following these approaches, we also identify four generations of street-led upgrading projects. The first generation of projects focused on infrastructure improvement and sanitary conditions of the settlements without much concerns for the urban structure of the area. A second generation included elements of

[5] UN-Habitat (2010). State of the World's Cities 2010/2011- Cities for All: Bridging the Urban Divide. Nairobi: UN-Habitat. London: Easthscan.
[6] UN-Habitat (2012). State of the World's Cities 2012-2013 – Prosperity of Cities. Nairobi: UN-Habitat. London: Earthscan.
[7] UN-Habitat (2016). World Cities Report 2016. Urbanization and Development: emerging futures. Nairobi: UN-Habitat.
[8] UN-Habitat (2015). Estimates by the Global Urban Observatory.
[9] Durand-Lasserve, Alain and V. Clerc (1996). pp 233-273.

community participation and participatory planning coupled with efforts to ensure security of tenure for its inhabitants and their involvement in infrastructure improvement processes with little concern for the urban configuration of the settlement. A third generation of projects, emerging particularly from the 90's onwards, focused on integrated settlement planning and development led by a vision for the city as a whole that focused on integrating slums into the city, moving away from project-basis towards citywide program interventions, and paying greater attention to the settlement layout, the urban plan, the land subdivision and the outline of the public and private domains.

This last generation of projects adopted an approach to improve the provision of basic infrastructure such as water, sewerage, electricity or drainage, implementing it together with improvements in the physical accessibility and spatial connectivity of the settlements in relation to nearby neighborhoods and the rest of the city. This was guided by an area-based plan that defined the future urban configuration of the settlements.

Finally, a fourth generation of street-led projects emerge at the beginning of the 21st century combining these approaches with a strong focus on the urbanistic and land property regularization sustained by a rights-based approach that recognizes the rights of residents over the land they occupy. Very often as in the case of Brazil and Colombia, this was associated with the enactment of national legislation regulating land rights in urban areas. In this case, the aim was to lay down the foundations for the gradual transformation of slums into formally consolidated neighborhoods of the city. It goes without saying that the recognition and commitment of member states of the United Nations in 1996 to the full and progressive realization of the right to adequate housing, with the adoption of the Habitat Agenda by governments and heads of states attending the UN Conference Habitat II in Istanbul, had a strong influence and provoqued shifts in policy and approaches towards slums and informal settlements.

It has to be said that the adoption of street-led strategies promoting the opening of new streets and pathways for the improvement and consolidation of existing streets is not new. This approach has been part of the common practices of slum upgrading and the renewal of informal settlements aiming at the creation of public pathways for the execution of infrastructure networks, improvement of accessibility and the overall quality of life and living conditions in slums. The new element that we recognize is the formulation and implementation of the area-based plan drawn on a strong urban planning and design approach that creates a network of streets and public spaces that reconnects slums to the urban fabric of the city. The area-based plan defines the public and private domains in the settlements and ultimately the new urban configuration and street networks. This is the cornerstone for local development processes, infrastructure improvements, land tenure regularization and future property and housing improvements fueled by the residents' resources.

Defining the Street-led Slum Upgrading Approach and its Goals.

The street-led approach sees streets not only as a vehicular road but as a route for incremental urban transformation that aim at integrating slums spatially, physically, socially, juridically and economically into the overall city development strategy. Such approach highlights the social and economic dimension of streets as a public domain.

The street-led approach to slum upgrading that was adopted by UN-Habitat in 2012[10] brings all these elements into a single strategy. It transforms the renewal of informal settlements and slums into an urban restructuring strategy that makes use of streets not only as the pathway for mobility and accessibility through which pipes, power lines, and drainage systems are laid out. It takes the streets as the common good and the public domain where social, cultural, economic and legal dimensions come into place[11].

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[10] UN-Habitat (2012). Streets as Tools for Urban Transformation in Slums: a street-led approach to citywide slum upgrading. Nairobi: UN-Habitat.
[11] Gehl, Jan and Lars Gemzoe (2006). "New City Spaces", Copenhagen: The Danish Architectural Press.

Streets become thus vital elements of the area-based plan to transform slums and improve the quality of life and ultimately connect them with the rest of the city. This is highly needed in densely and haphazardly occupied informal settlements where the lack of streets and public spaces place an additional hardship on people's life.

The adoption of a street-led approach, which includes the area-based urban plan, requires a critical look at the demolition of buildings and the selective identification of families/buildings that must be relocated in order to create the future urban layout of the settlement. This will allow to lay down the infrastructure networks and improve accessibility via the opening or consolidation of streets and pathways for pedestrians and vehicles where needed and possible. Given the irregular and unplanned character of the urban layout of slums, the provision of basic infrastructure without resolving the urban spatial structure and street pattern of the settlements has proven to be ineffective and costly and should be discouraged. In this sense, the area-based plan is critical to define the public domain through which the networks of infrastructure will be implemented, and a way to establish a strong connectivity to the rest of the urban fabric of the city, and generate greater accessibility and opportunities for further property regularization.
Several examples of projects in the favelas during the Favela Bairro Programme in Rio de Janeiro demonstrate this[12]. Opening streets, or reinforcing and improving existing streets and accesses is a *sine-qua-non* condition in the renewal and upgrading interventions of slums and informal settlements[13], with the objective of creating an urban configuration that physically and spatially integrates slums into the overall city planning and management, and regains the spatial connectivity while fostering urban economy and the physical regeneration of the area[14].
Selective demolitions and relocations derived from street-led slum upgrading will have a direct impact on levels of urban density and patterns of land occupation and regularization.

The Practice of Street-led Slum Upgrading

The foundation of the practice of street-led slum upgrading lies at the core of urban spatial planning at the settlement level. At first, a careful analysis of existing patterns of streets and pathways, circulation, social uses of space and the existing urban configuration should lead to strategic design decisions and choices leading to an approach in phases. It helps to identify existing patterns of streets and pathways some of which can be upgraded and consolidated. The streets initially selected for improvement will be those that are likely to bring the highest outcome in terms of development opportunities, poverty reduction, accessibility, efficiency and optimization of land use, and generation of urban and property value. The choice of a particular street, followed by others incrementally, will determine the logic of land subdivision and future property regularization, and maximize the economy of those streets as a function of slum upgrading that will likely propel development and income generation activities with impacts on the city as a whole.

The street-led strategy to citywide slum upgrading is consistent with property rights and the right to adequate housing which enshrines the right not to be forcibly evicted. While it recognizes the need for demolition and relocation of some residents in order to provide room for better and more optimal settlement urban configuration, it is also unwaveringly grounded in the rights of individuals and households through participatory enumerations and solid community involvement. This strategy

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[12] Conde, Luiz Paulo and Sérgio Magalhães (2004). "Favela-Bairro: rewriting the history of Rio", Rio de Janeiro: ViverCidades.
[13] For more detailed analysis on public spaces, streets and public life in cities see Favro, Celik and Inger Soll, eds. (1994). Streets, Critical Perspectives on Public Space. USA: University of California Press 1994; Ghel, Jan, Gemzoe, Kirkneas and Sodergaard (2006). New City Life. Copenhagen: Danish Architectural Press 2006; Gehl, Jan (1996). Life Between Buildings. Copenhagen: Danish Architectural Press,
[14] UN-Habitat (2012). Streets as Tools for Urban Transformation in Slums: a street-led approach to citywide slum upgrading. Nairobi: UN-Habitat.

addresses the need to provide accessible and well-designed public spaces which are important elements of the agenda to improve quality of life and social interaction within the public domain. It is worth noting that street-led slum upgrading is closely associated with the provision of public space which contributes directly to the achievement of the Sustainable Development Goals (SDG) Target 11.7, which aims at the provision of universal access to safe, inclusive and accessible, green and public spaces, in particular for women, children, elder population and persons with disabilities. In this respect, it also contributes to the SDG 5 that calls for the achievement of gender equality and empowerment of all women, which is also linked to SDG 11 through access to and safety in public spaces, access and use of basic infrastructure, and participation in local governance and decision-making.

International examples show that it is feasible to implement this strategy and the demolitions and relocations required for this purpose can be undertaken through processes of community mapping, enumeration and participatory planning. In the cases of Ghousia Colony (Karachi), Tirana (Albania) and Bissau (Guinea-Bissau) once the advantages of street widening were discussed, people got involved in field surveys and demarcation of street boundaries and private plot boundaries. They voluntarily gave up portions of their plots and demolished and reconstructed the affected properties. Relocations were also carried out in Karachi in a cooperative manner.

The case of the favela-Bairro Programme of Rio de Janeiro also involved demolitions of buildings and relocation of residents for opening up streets using a criteria defined jointly by the Municipality and the Inter-American Development Bank. The programme defined acceptable amounts of demolitions and relocations and the threshold for financing housing reconstruction so that upgrading would not be transformed into a resettlement project. The strategy was to keep relocation to the minimum necessary to realize the urban restructuring of the settlement and relocate residents to resettlement areas situated as close to the original settlement as possible in order to minimize the adverse impact on social and safety networks of residents.

In Lusaka, Zambia, in one of the first large scale slum upgrading and sites and service project financed by the World Bank during the 1970's, road planning groups were organized to draw up demolition and relocation plans to be presented to the community which included alternate alignments of roads for settlement upgrading, clearly showing the demolitions required in order to implement the agreed road network. Once the plan was agreed, relocations were accommodated.

Finally, in Medellin, Colombia, a negotiated process of demolition and selective relocation in the first decade of the 21st century provided room for urban regeneration and clearing rights of way and land free of buildings for implementing the 'metrocable' system, a cable car public transport to provide access to poor and low-income settlements located on slopes. Those affected were supported to relocate to new housing within the area or outside by choice. Compensation was based on the amount required to buy a house, but lower than the cost of new social housing.

The Rationale and Benefits of a Street-led Approach to Renewing and Upgrading Informal Settlements

A study carried out by UN-Habitat provides evidences showing a strong co-relation between high street connectivity index and high city prosperity index[15]. In other words, a well-planned and well-connected urban spatial structure promotes prosperity for all. Conversely, cities that have large parts of its urban structure as unplanned and subject to informal and random-type of land occupation are penalized on its city prosperity index. Thus, unplanned and informally occupied land that lacks streets and connectivity to the rest of the city – pockets of randomly occupied land – adversely affects the lives of all city residents. In another study, UN-Habitat provides evidences drawn from international comparative analysis showing the amount of land allocated to streets and the number of street intersections per Km2. This study strengthens the argument that the amount of land taken for opening streets and public spaces is an

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[15] UN-Habitat (2013). Streets as Public Spaces and Drivers of Urban Prosperity. Nairobi: UN-Habitat.

important feature of the spatial plan and the ultimate urban spatial structure of cities. Cities that have adequate land that is used for streets and public spaces and reveal greater connectivity are cities that are more livable and productive[16]. Scaling up street connectivity through urban spatial restructuring by adopting a street-led upgrading strategy is likely to bring positive transformations of slums and informal settlements which are beneficial for informal settlers, slum residents, as well as residents of other neighborhoods.

Street-led approach to slum upgrading also promotes an incremental spatial inclusion, residential inclusion and physical integration that are likely to stimulate economic activity. Because street-led approaches strengthens the development and consolidation of streets, it ends up also attracting commercial activities, the opening and clustering of shops and services along these main access routes, encouraging private investment in housing and business improvements and triggering cultural identity and sense of belonging with their place of residence amongst the residents. The adoption of street-led approach frees land for and paves the way for universal access to basic infrastructure and helps developing a sense of security triggering planned urban development that supports the achievement of the Sustainable Development Goal 11[17].

In addition to provide better accessibility and connectivity and the optimal use of the networks of basic infrastructures, the street-led approach increases the sense of belonging because it facilitates the definition of the street addresses, names and locations of the place of residence of its inhabitants. This allows the residents to gain and claim a physical address and a postal code for the place where they live. The benefits of this approach are clearly demonstrated in the case of the favelas in Rio de Janeiro, where street addressing was a citizenship demand of the favela movement and a part of the urban development strategy of the city[18]. Ultimately, this approach supports the realization of the right to the city by slum residents.

Reflections from Latin America about citywide slum upgrading.

Slum upgrading has a long track-record in Latin America. As stated by UN-Habitat[19] in its street-led citywide slum upgrading approach, the experiences in Latin America draw lessons that have global significance. The report highlights the importance of building citizenship through integrated slum upgrading interventions intertwined by a participatory planning that addresses the physical, social and economic problems found in the settlements and neighborhoods linked to them[20].

The Inter-American Development Bank (IDB) has been a key actor in the Latin American experience sponsoring more than 20 slum upgrading programs in different cities of the region revealing improvements in the self-built housing stock, better health indicators and reduced vulnerability. Through these programs housing conditions and accessibility to workplaces were improved due to investment in streets and the physical integration of slums, and improvements in potable water provision and access to

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[16] UN-Habitat (2013). The Revelance of Street Patterns and Public Space in Urban Areas. UN-Habitat Working Paper April 2013. Nairobi: UN-Habitat.

[17] The Agenda 2030 adopted in 2015 by the United Nations as one of the outcomes of the Rio+ Conference on Environment and Development laid down 17 Sustainable Development Goals (SDG's). The SDG 11 aims at making cities and human settlements inclusive, safe, resilient and sustainable.

[18] Acioly Jr., Claudio (2001). "Reviewing Urban Revitalisation Strategies in Rio de Janeiro: from urban project to urban mana gement approaches", in GeoForum: Special Issue on Urban Brazil, Volume 32, Number 4, November 2001, UK: Elsevier.

[19] UN-Habitat (2012). Streets as Tools for Urban Transformation in Slums: a street-led approach to citywide slum upgrading. Nairobi: UN-Habitat.

[20] Rojas, Eduardo (2010).

sewerage systems and garbage collection caused significant impacts when executed in conjunction with street works[21].

In another study of eleven slum upgrading experiences completed in the mid-1980's in multiple countries in Latin America, the authors[22] show how investments in urban services delivered through streets generates private investment in home improvement carried out by residents using their own resources. Investments in infrastructure generated *de facto* tenure security and significant increase in property value.

In addition, the research conducted by Durand-Lasserve, Alain and Clerc[23] show us some case studies from various slum upgrading experiences during the 1990's that demonstrated the suitability of an incremental development approach to urbanization and infrastructure provision as the foundation for an effective slum upgrading. Street-pavement connected to minimum standards of infrastructure and service provision proved to be successful, which is consistent with the street-led approach to citywide slum upgrading that advocates for phased development, incrementally executed and focusing strategically on a few streets at first to deliver higher impacts and trigger subsequent development. By underscoring shortcomings of approaches aiming at high standards of infrastructure and legalization of land tenure via individual titles, the research conversely supports the incremental street-led propositions.

The Brazil experience in street-led slum upgrading: Favela Jacarezinho

Brazil has a long experience in the upgrading of informal settlements and slums[24]. The largest cities in Brazil, like Rio de Janeiro, São Paulo, Belo Horizonte, Recife and Brasilia have developed citywide slum upgrading programs including the street-led approach associated with area-based plans as one of the strategies. These programs recognize the need of these strategies for the implementation of the infrastructure networks, cables, pipes, drainage gutters and power lines, while showing that street-led citywide slum upgrading helps to improve the connectivity and integration of the settlements into the physical, economic, social and environmental domains of the city whenever embedded in the urban planning process of the city, becoming part and parcel of the detailed planning at the neighborhood level. In addition, the proposal of area-based plan fully connects the informal settlements with the planning of the surrounding neighborhoods giving a vision for the future transformation and the foundations for the formalization of these areas. Especially when it is executed as part of the participatory area-based plan.

The Favela-Bairro Citywide Slum Upgrading Programme was a ground-breaking and pioneer municipal programme brought to a scale never seen before, promoting multiple upgrading projects in prioritized favelas under a well-established programme coordination system which was part of an innovative institutional management framework[25] established by the Municipality of Rio and fully operational during the period 1992-1995. The slum upgrading projects carried out under the Favela-Bairro Program[26], that was executed by the Municipality of Rio de Janeiro for more than a decade from 1993 onwards, adopted the street-led slum upgrading and the area-based plan strategies as the foundation for public intervention in the favelas and putting into practice innovative tools aiming at the conversion of favelas into formal city neighborhoods. The urban layout plans followed by street naming allowed for strong citizen

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[21] Brakarz, J. (2002), pg. 67

[22] Skinner, Taylor, and Wegelin (1987)

[23] Durand-Lasserve, Alain and V. Clerc (1996). pp 233-273.

[24] UN-Habitat (2017). Brazil. Impact Story. Nairobi: Participatory Slum Upgrading-PSUP. UN-Habitat.

[25] Acioly, Claudio (2001). Reviewing Urban Revitalization Strategies in Rio de Janeiro: from urban project to urban management approaches. In Geoforum 32 (2001) 509-520.
http://www.claudioacioly.com/downloads/articles/Acioly%202001_Revitalisation%20Strategies%20Rio_Geoforum.pdf

[26] Magalhães, Fernanda (ed) (2016). Slum Upgrading and Housing in Latin America. Washington: Inter American Development Bank.

participation in formalizing the addresses and give names to streets in the settlements and by default including them in the map of the city and public registry of addresses. These were particularly important for getting a unique identity and official postal address that facilitated the access of residents to an official place of residence, which is one of the pre-conditions for acquiring credit in shops and commercial transactions. Not mentioning the inclusion in the city map. Public spaces in the form of small plazas, leisure spaces and sports facilities were implemented closely linked with the opening and urbanization of streets, resulting in greater accessibility and improved quality of life. Opening streets also allowed policing and extension of city services into the favelas which was followed by the UPP program[27] and social development programs in more than 200 Favelas.

The case of the upgrading plan of the Favela Jacarezinho illustrates well the street-led approach. Jacarezinho is one of Rio de Janeiro's largest slums with its nearly 50,000 inhabitants and originally considered as a large favela subject to specific Favela Bairro Programme targeting large favelas. (Fig. 1 and 2)

Following the model of public tendering adopted by the Favela Bairro Program for the individual projects in the favelas, the private architecture and planning firm PRODEC/ArquiTraço was commissioned to undertake the project design for Favela Jacarezinho. The goal was to lay out the settlement plan and an urban regeneration strategy that would include streets and public spaces, greater accessibility and connectivity with surrounding areas, lower building densities when possible amongst other things. After the first plan was presented, the municipality requested the formulation of other variant of the plan that would produce more streets, squares and greater accessibility in order to achieve more accessibility and decrease the building density in lieu of more streets and public spaces. The involvement of the residents and public participation was not always easy due to the actions of the drug barons in the area. The issues about how much relocation would be acceptable for laying out the proposed street network and how many houses were to be demolished to break the very dense occupation for opening up public spaces were subject of heavy debate. A partnership with the neighboring GE Industry enabled the opening of an important access avenue linking two neighborhoods through the settlement which became one of the first land readjustment project in the city.

Roads have been designed to provide access and create public spaces where none existed before. These streets and spaces perform symbolic and physical functions of connections within the settlement and with the city, and they also allow the physical presence of the state, as police are able for the first time, to physically move through the area trying to control organized crime and drug trafficking, endemic in most favelas. The new roads provide an artery for the distribution of basic services and they allow the creation of points of concentration for gathering and location of public amenities, many of which are shared with adjoining neighborhoods, leading to greater inclusion. The naming and numbering of streets has allowed the extension of city mapping into favelas for the first time and gives these dwellings a location and identity in the city, giving them a reality they did not have before. As a consequence of these actions the housing values have increased in upgraded favelas.

The programme is an example of slum upgrading without full land tenure legalization and for its use of the concession of right to use land in order to allow this program to take place. There was greater emphasis on the improvement of infrastructure and living conditions through opening roads and pathways, which has had the effect of increasing the security of tenure of favela residents.

Opening streets was the most difficult task to negotiate in the upgrading because of the steep terrain in most favelas, demolition of some houses and financial limits. However, an evaluation of the first two phases of Favela-Bairro by IDB shows that the multiple benefits far surpassed the difficulties.

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[27] The Pacifying Police Unit (Unidade de Polícia Pacificadora also known as UPP) was pioneered in Rio de Janeiro with the goal of reclaiming the territorial control in the favelas which were controlled by drug dealers.
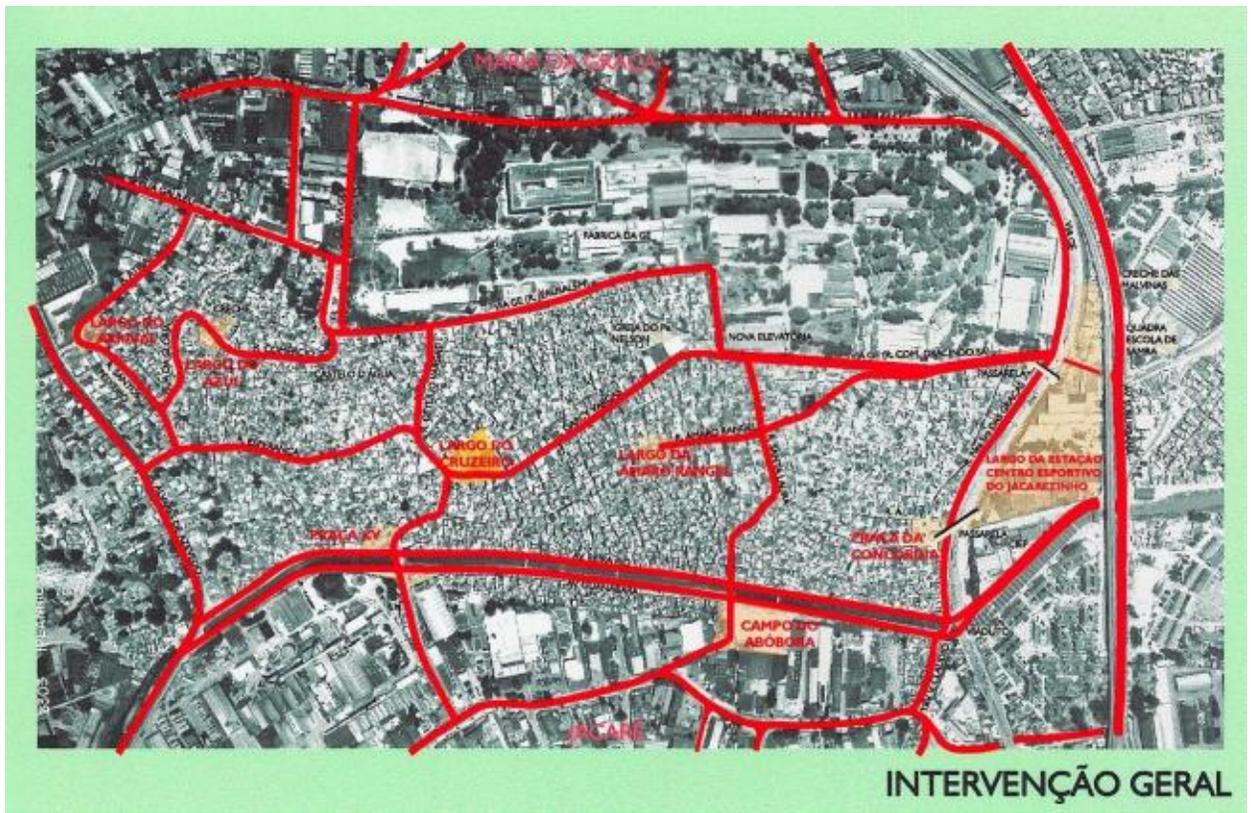
Figure 1: Slum Upgrading Plan of the Favela of Jacarezinha by Arqui-Traço and PRODEC. Courtesy of Solange Carvalho

Figure 2: Expanded Slum Upgrading Plan of Favela Jacarezinho, by Arqui-Traço and PRODEC. Courtesy of Solange Carvalho.

CASE STUDY SAO PAULO:
Street-led Citywide Slum Upgrading Programme in São Paulo
São Paulo is the largest Brazilian city and "the largest city proper in the Americas and the southern hemisphere. It is also one of the top 10 largest metropolitan regions in the world"[28] with a robust economy that contributes to a significant share of Brazil's GDP. Just like Rio de Janeiro did in the beginning of the 90's, São Paulo also adopted a comprehensive municipal housing policy[29] in 2007 which included policies and multiple programmes addressing the problems of slums and informal settlements, inner city tenement housing and irregular land subdivisions amongst other issues such as tenure regularization, and upgradation of public housing estates. The citywide slum upgrading programme[30] (2005-2008) led by SEHAB, the Municipal Housing Secretariat, was one of the largest of its kind in Brazil next to Rio de Janeiro's Favela Bairro.

Nearly 10 years after the ground-breaking Favela Bairro Programme in Rio de Janeiro[31], the municipality of São Paulo kicked off in 2001 the development of a comprehensive urban development strategy

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[28] http://worldpopulationreview.com/world-cities/sao-paulo-population/

[29] Prefeitura de São Paulo (2008). Habitação de Interesse Social em São Paulo: desafios e novos instrumentos de gestão. São Paulo: Cities Alliance and Prefeitura de São Paulo.

[30] Prefeitura de São Paulo (2008a). 'Urbanização de Favelas. A experiência de São Paulo'. São Paulo: Boldarini Arquitetura e Urbanismo. Cities Alliance (2008). 'Slum Upgrading Upclose. Experience in Six Cities. An International Policy Dialogue: challenges of slum upgrading in São Paulo, Brazil. P110791. Washington: Cities Alliance.

[31] The citywide slum upgrading - Favela Bairro Programme was launched in 1993 by the Municipality of Rio de Janeiro as an integral part of a broad municipal housing policy for the city, led first by an interim Municipal Housing Department.

focusing on the poorest segments of the population[32]. In 2004, it embarked into the formulation of a sustainable municipal housing policy which was closely associated with the establishment of a comprehensive information system that included a geo-referenced, mapping and cadastral information[33] about all the favelas and informal settlements in the municipality's territory with detailed information about each settlement, households, housing enumeration, occupants' social economic profile, site risk assessment and so on. This was the result of a collaboration with the Cities Alliance and helped the municipality to design well-informed and evidence-based policy and programmes. The municipal housing policy prevailed during the period 2005-2012 and provided important lessons for the practice of slum upgrading, as outlined thereafter.

The municipal information system unveiled the existence of nearly 1,600 favelas, more than 1,000 irregular settlements and illegal land subdivisions and nearly 1,700 tenement housing (cortiços)[34]. The favelas and irregular settlements are predominantly located in the peripheral areas and provide housing to 30% of the city's population[35], the equivalent of about 3 million inhabitants. In 2008, the municipality of São Paulo had nearly 11 million inhabitants, the largest agglomeration of the São Paulo Metropolitan Region comprised of 39 municipalities where more than 20 million people live and work. Today, the city alone is estimated to house 12 million inhabitants[36].

The citywide slum programme drew on the lessons and experiences of the Municipal Program for the Urban Regeneration and Environmental Sanitation of the Catchment Area and Water Basin of the Guarapiranga lake/dam. This was a complex and flagship program with funding from the World Bank which addressed a conurbation of informal settlements located within the jurisdiction of seven municipalities, mostly originated from illegal land subdivisions, encroached onto the city's most vulnerable and sensitive environmental area and from where the city extracts part of its potable water provision. The scale of the occupation and the level of the building consolidation made it nearly impossible to think of any other solution rather than embarking into upgrading and the urban regeneration of the area that could prevent pollution and preserve the environmental resources particularly the water catchment areas vital for the city. This is regarded as the first large-scale slum upgrading programme in the city of São Paulo.[37]

One of the main lessons learned from the Guarapiranga Programme relates to the strategic importance of the urbanistic plan as an enabler of the integration and physical/spatial connectivity of the settlements with the surrounding districts, combined with the improvement of the public space and the provision of public goods – streets, accessibility and basic infrastructure services such as water, sewerage, drainage and street pavement aiming at improving the quality of life and public services. Although it is not named as such, the street-led upgrading approach established the foundations for the land tenure regularization and registration and by default for the future consolidation of the settlements while encouraging individual's private investment in housing construction and home improvement.

The São Paulo citywide slum upgrading programme focused initially on 26 favelas attending 130,000 families, the equivalent of nearly 500,000 people. A planning and implementation methodology were

[32] Cities Alliance (undated). Cities Alliance in Action. Technology that Transformed Urban Planning in São Paulo: HABISP. Washington: Cities Alliance.

[33] At first the database was stored at www.habisp.inf.br and served for the municipality to formulate evidence-based policies and take well-informed policy decisions. Today the information is accessible at http://www.habitasampa.inf.br/

[34] Prefeitura de São Paulo (2008). 'Urbanização de Favelas. A experiência de São Paulo'. São Paulo: Boldarini Arquitetura e Urbanismo

[35] Prefeitura, 2008a; Cities Alliance, 2008, Ibid.

[36] http://worldpopulationreview.com/world-cities/sao-paulo-population/

[37] França, Elisabete (2013) "Slum Upgrading: A Challenge as Big as the City of São Paulo," Focus: Vol. 10: Iss. 1, Article 20. DOI: 10.15368/focus.2013v10n1.10 Available at: http://digitalcommons.calpoly.edu/focus/vol10/iss1/20

developed to guide public interventions. For each favela, an area-based plan was formulated through a technical but also consultative process involving the inhabitants via focus groups meetings and general popular assemblies. The plans comprised of a street network to facilitate accessibility and circulation of motorized vehicles and people on foot. There was a deliberate intention to enhance accessibility so that ambulances, garbage collection, police, postal services, as well as potable water, sewerage and drainage network systems could be implemented as efficiently as possible. The explicit goal of the programme was to integrate the favelas into the city and provide public space of quality and improve accessibility of its inhabitants to work places, schools and health facilities. In a way reverse the social and spatial segregation. The assumption was that the government would focus on the public goods while housing and home improvement would be left entirely to the residents using their own means, savings and private resources. Spatial inclusion was meant to generate trickle down effects in terms of social inclusion, accessibility and better quality of life.

The Citywide Slum Upgrading Programme was part and parcel of the strategic master plan enacted in 2002 and provided the opportunity for the municipal government to adopt the instruments of the Statute of the City (Law 10.257/2001) regarding tenure regularization. The programme established a laudable institutional collaboration framework. It aligned itself with the MDGs (water and slum improvement) and involved multiple institutions from the Federal and State governments and international organizations such as the CDHU-Housing and Urban Development Company of the State of São Paulo, the Cities Alliance, the State Housing Coorporation-Cohab and the PAC-Growth Acceleration Programme.

The lessons learned from the first seven upgrading projects reassured the assumptions of the programme and provided important feedback to support adaptations and refinement of the upgrading strategy. The settlement plan and provision of public spaces of good quality strengthened the connectivity and integration with the nearby districts and neighborhoods, giving indication about how to restructure the physical space and layout of the favelas. The plan was key for the physical/spatial integration of the settlements into the city which took into account the building stock produced by the inhabitants[38].

The favela upgrading projects implemented under the São Paulo's citywide slum upgrading programme demonstrated the adoption of a street-led upgrading approach which was built-in into the area-based plan, an urban layout design and the street network. The urban layout design set the parameters of the plan and the street-led development process. This was the basis to direct public investments on the public goods along the main streets which the residents were neither able to access nor realize on their own. In other words, it focused on improving and/or (re)defining the street networks through which the drainage, sewerage and water supply systems as well as the electricity power lines and street pavement were laid down. The (re)definition of streets required the demolition and posterior resettlement of inhabitants whose house were located on the route of the street networks and pathways of infrastructure as well as those located on risk prone areas.

The ultimate goal was to integrate these areas into the spatial structure of the city and reverse the extreme level of social and spatial exclusion that the residents and these areas were subject to. Slum Upgrading It worth noting that this approach is fully aligned with the Agenda 2030 and particularly with the Sustainable Development Goal 11, aiming at leaving no one and no place behind by aiming at the supply of affordable housing for all and the upgrading of slums.

The upgrading plan for Heliopolis, one of São Paulo's largest favelas, illustrates the street-led citywide slum upgrading approach where the street network and new housing are visible.

[38] Prefeitura, 2008a; Cities Alliance, 2008, Ibid.

Figure 3: Plan of Heliopolis, Source Municipality of São Paulo
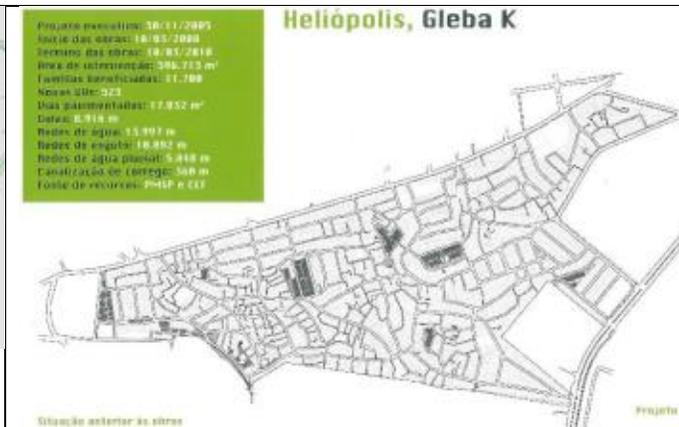

Heliópolis, Gleba K

Figure 4: Section K of Heliopolis Plan, Source Municipality of São Paulo

There are important lessons to be learned from São Paulo's experience with slum upgrading. First of all, slum upgrading is a key element of the municipal housing policy promoting housing improvements, accessibility to public services and improvements in the overall housing stock accessible by low income population. Provision of accessible, good quality and well-designed public space reinforces the physical and spatial integration of favelas into the city enabling its residents to become citizens who fully enjoy the benefits of urban development and gain access to jobs, services, mobility and so on. This is a result of the urban design of the settlement which took into account social practices, geological, physical and morphological aspects of each favela. The design played an important role in defining the urban layout, the street networks combined with public spaces that triggered the incremental transformation of favelas into an articulated and accessible neighbourhood[39]. Slum upgrading was thus a tool for urban transformation and for social and spatial inclusion. In that regard, the street-led slum upgrading became a tool to realize inclusive cities and neighborhoods.

Figure 5: Paraisopolis. Source: Municipality of Sao Paulo

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[39] França, Elisabete and Fabienne Hoelzel (2011). Integrating Informal Cities: Prime Challenge for Megacities of the South. 14 April 2011, in https://www.boell.de/en/navigation/urban-development-elisabete-franca-fabienne-hoelzel-sao-paulo-11732.html

Conclusive Remarks

Urban transformation in slums, if successful, should reveal an incremental development process through which informality and randomly occupied land are gradually replaced by planned and deliberate actions that integrates slums into the formal governance systems that regulate urban land development in cities. The area-based plan and accompanied street network lays down the foundations for this transformation that includes social and spatial inclusion, land and property regularization, accessibility to basic infrastructure and an overall improvement in the quality of life of its inhabitants. This street-led transformation reveals the transformative potential of the approach to produce the inclusive city. In this respect, it brings about changes that:

(1) the slum dweller becomes a citizen;
(2) the shack becomes a house, and
(3) the slum settlement becomes a neighborhood[40].

This transformative and time-bound path was highlighted by six slum upgrading experiences from different megacities in Asia, Africa and Latin America which were presented during a dialogue sponsored by the Municipality of São Paulo and the Cities Alliance[41].

The Brazilian experience, and in particular the Rio de Janeiro and São Paulo experiences, provide important lessons for countries and cities that wish to embark into a large-scale citywide slum upgrading programme. On the positive side, both cases reinforce the need to establish an institutional and organizational environment that is conducive for local governments to embark into multiple, comprehensive and multi-year programming and implementation. Both cases highlight the vital role played by the single urban project for each favela/slum comprised of the area-based plan, the urban layout design and the street network which altogether materialize in practice the street-led upgrading strategy[42]. Undoubtedly this lays down the foundation for land tenure regularization, street addressing, provision of garbage collection, infrastructure supply, improved quality of life, improved safety, spatial connectivity and better accessibility to the nearby districts and the city as whole.

However, this is not enough to guarantee the full inclusion of the upgraded slums now transformed into improved neighborhoods into the urban management and planning systems of the city. The ten years after showed significant improvement. Ten years later, the municipality unveiled its achievements showing a total of 54 favelas upgraded during the first phase and 89 during the second phase, delivering an impressive 500 km of water pipes, 548 sewerage pipes which is more than the distance London-Paris, and 1,7 square million of paved roads[43]. The inclusion into the property registry of the municipality and into the priority list of service providers as well as the tenure regularization does not happen automatically. Leaving no one and no place behind takes more than the physical and spatial inclusion. It takes much longer time than the life span of the projects and programmes. Institutions do not change their behavior quickly towards neighbourhoods that were once slums. Stigma continue to hinder the social and spatial inclusion of these areas unless community leaders and social and human rights activists are pushing for this change. As favela dweller says: "things are getting better. But street names don't stop people getting killed" (Scudamore, 2010:135). [44]

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[40] Cities Alliance and Municipality of São Paulo (2008)

[41] The cities involved in the international policy dialogue on slum upgrading sponsored by the Cities Alliance and sponsored by the city of São Paulo were: Cairo, Ekurhuleni, Lagos, Manila, Mumbai and the host São Paulo.

[42] Conde, Luiz Paulo and Sérgio Magalhães (2004). Favela Bairro: uma outra história da cidade do Rio de Janeiro. Rio de Janeiro: Viver Cidades.

[43] Municipality of Rio de Janeiro and InterAmerican Development Bank (2003). Favela Bairro. Ten Years Integrating into the City. Rio de Janeiro: Fundação Universitária José Bonifacio.

[44] Scudamore, James, (2010), Heliopolis. London: Vintage Books

Considering that the land property regularization in one of the first favelas upgraded by Favela Bairro Program took nearly 20 years to be achieved[45], one should conclude that the area-based plan and the street-led approach alone that were adopted by the program was not sufficient to enable the full integration of these areas into the city. Certainly, time and resources but also political will in addition to the complexity of property regularization in a context of densely occupied settlements are not an easy task. The legalization and registration of tenure is also a conventional and time-consuming process that involves multiple steps and institutions. In São Paulo as well as in Rio, both programmes considered the integration of the spatial/physical improvements with social, economic, institutional and environmental actions that would improve access to jobs and income as much as support to youth, women-headed households, health and environmental resilience. In Rio de Janeiro, it also included the establishment of the POUSO[46], the Municipal Office for Social and Urbanistic/Building Orientation, in each favela after completion of the upgrading works. At a certain point there were more than 50 POUSOS in the city which unfortunately were discontinued because of lack of finance. This is a common fate of urban renewal and slum upgrading programmes globally, a fate that needs to be changed if we aim to achieve the transformational Agenda 2030 in cities and human settlements.

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[45] http://www.rio.rj.gov.br/web/guest/exibeconteudo?id=7766264

[46] Posto de Orientação Urbanistica e Social. This is an advanced administrative office of the municipality of Rio staffed by engineers, architects, social workers and community builders which provided technical advice as well as social support to residents. This was instrumental to ground the land-use plan and the minimal building parameters for those willing to expand their housing nit.