

The re-urbanization of the city center of Manaus, Brazil

Facing the challenges of informal settlements

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Introduction

Illegal occupation of urban land in Brazil is a widespread phenomenon. Slum dwellers are excluded from the attributes of urban citizenship although they provide the labor force required by low productivity urban services needed by cities. Illegal settlements generate multiple problems for the rest of the city. Its solution is of key relevance to the city in general but also provide an opportunity for the social and economic advancement of slum dwellers. The programs required to attain these results are complex and difficult to implement underscoring the challenges countries will face to attain the Millennium Development Goals of reducing the population living in slums.

Manaus in Brazil is confronting these problems and provides practitioners sobering lessons. A recent project launched by the Estate Government of Manaus with partial financing from the Inter American Development Bank¹ offers a good opportunity to discuss those issues. Illegal occupation of land is a major problem in Brazil. This project shows how this problem was faced in the city of Manaus by improving the environmental and urban quality of a central area of the city.

Similar to other cities of Brazil that have grown without major planning control, Manaus population increased fivefold between 1970 and 2003, growing from 300.000 thousand inhabitants to almost 5 millions in the same period. This dramatic growth occurred without land use and infrastructure programs promoting the rapid expansion of the illegal settlements. Some occupied areas are of great environmental fragility, ravines (Igarapes) that are essential for the natural drainage, as it the case analyzed here. This occupation results in exceedingly poor living conditions, the almost total blockage of the natural drainage system and negative externalities for the city's CBD. A Master Plan recently completed in 2002 foresees Areas of Special Social Interest and opens way to the development of new legal and management instruments to tackle the problem.

This high-cost and complex engineering and social project represents a major opportunity to text a new approach to the problem through: (1) the provision of infrastructure and the solution of the environmental problems with drainage and rehabilitation of the Igarapes; (2) the upgrading of the urban and environmental conditions of the CBD, particularly by the construction of an urban park (3) the improvement of housing conditions on by the development of in-fill public land nearby with significant impact over the city as whole; (4) the promotion of social inclusion and spatial

¹ The opinions contained in this paper express solely of its authors

integration; (5) the opportunity to test legal and urban instruments that could eventually be used in other similar situations.

The Problem

The city of Manaus showed in 2002 a gross density of 926,9 sqm/inh and a built housing density of 627,8 sqm/inh. The municipality occupies an area of 11.458,5 sqkm and an urban area of 377 sqkm. It is located on low highlands on the left margin of confluence of the Negro river with the Solimoes river, where the Amazon river originates. It occupies two river basins – Sao Raimundo and Educandos-Quarenta with an extension of 10625 hectares and 3834 hectares respectively. The river basin of Educandos-Quarenta, where the project here studied is located, has the higher housing density with a population of 580.000 people and it is on the oldest and more central area of the city.

The area holds the highest annual rates of landslides and the higher rates of illness connected with lack of sanitation (and thus mortality). It is estimated that at least 7000 families (36000 people) live in high-risk conditions, mostly in shacks over the water. Estimates indicate that a total of 70000 dwellings (around 30000 people) occupy river margins or areas subject to flooding. This is the most difficult problem the city faces.



Most of the housing found in these areas lack regular electricity and water services, often holding clandestine connections. Raw sewage and garbage are thrown on the Igarapes, compromising the natural drainage system - the sewage network covers only 3% of the total number of houses, the majority uses septical tanks. The frequent flooding are not due to the seasonal fluctuations of the Negro river water table (as it commonly believed), but rather to the mal functioning of the drainage network and diminishing of permeability conditions, as often is the case in most Brazilian cities. The drainage problems in the Igarapes area is made even worst by the irregular occupation of land, garbage and lack of a micro-drainage system.

The illegal occupation of the area also generates problems of marginality, exclusion and of great vulnerability. Although the population benefits from living in a central area with easier access to employment, infrastructure and services – especially health and education – living conditions are very poor. Land occupation informality, bad housing conditions and the environmental risks result in spaces of very low urban quality, lacking specially leisure facilities and open spaces as well as adequate circulation and access to the residential units making difficult garbage collection and emergency support.

Aims of the intervention on the Igarapes

The intervention on the Igarapes – initially only the Igarapes of Manaus, Bittencourt and Mestre Chico will be covered – has been designed as an action oriented towards tackling a three fold problem: social, environmental and urban, to mitigate the negative effects of the disorderly urban growth of the city over the natural environment. The improvement on the local conditions (environmental, of sanitation, public services and infrastructure) will not only benefit the population living on the area but will improve the quality of life of the habitants of the city in general, particularly those using the CBD. It will be an action that by promoting more equity – amongst the social groups and on the different areas of city – will contribute to reduce social and spatial exclusion.

The strategy adopted in the Manaus Igarapes emphasize an action integrated in four fronts – environmental, sanitation, social, urban and housing, and aims at: (i) contribute to improve the environmental and housing conditions by recuperating the micro and macro drainage system and the urban ordering of the areas subject to flooding and its surroundings; the construction of new housing to the people to be resettled, the treatment of the recharging areas of the aquifers; (ii) to solve environmental and natural resources management problems - in particular regarding to ecologically vulnerable areas – through the improvement of the hydraulic and sanitation conditions aiming at reducing health problems by means of extending the sewage and water networks, garbage collection and environmental education; (iii) the improvement on the community and on the institutional operational and management capacity, strengthen community participation, as a means to guarantee the sustainability of the designed actions - planning, policy development, management, administration, institutional strengthening, improvement on the legal framework guided to low income people – as a means to benefit the entire city of Manaus population; (iv) to support actions that would allow low-income families access to serviced land for residential uses in the market and to reduce social inequality and poverty;



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Strategy for the sector in Brazil

Brazil holds a consolidated experience to approach social, environmental and urban problems that have got more acute in recent decades as a result of its fast and uncontrolled urban growth. Among the more well known best practices are the Favela-bairro in Rio de Janeiro that is focused in integrating the informal settlements of the city – the favelas – into the formal structural of the neighboring boroughs, recognizing the favelas as an important socio-cultural and political environment for the city; and Baixada Viva, that introduces the direct citizen participation into the supervision of public services.

The main emphasis adopted by the sector follows the guidelines set by the United Nations (Habitat, 1995; Global Strategy for Housing for 2000) to improve life conditions of people living in squatter settlements, giving priority to actions that promote an integrated urbanization that maintain people in their place and resolve “in situ” their problems. Generally, it is recognized the need to face the informality problem through the adoption of policies that promote urban and legal regularization. The common strategy of those actions is to fully integrate those settlements to the city by means of tackling their environmental problems and deficiencies in infrastructures and services; they often include improving the security of tenure by issuing property titles to users.

The issue of informality on use and occupation of land, expressed by the legal and urban irregularity, is an acute problem in Brazil. Seldom this is a result of (or worsen by) the existing legal and political framework. A significant body of literature has called the attention to the perverse and segregated effects of the Brazilian legalization and of the current urban and management instruments (Ferreira dos Santos, 1995; Maricato, 1994; Lago, 1999; Rolnick, 2003; and Cardoso, 2003).

The lack of a housing policy and a housing finance system in the country that are able to cover the low income sectors, and a complete absence of urban land provision and credit – that is mostly guided to middle class and the formal sector – creates a situation where the only alternative is the illegal occupation of land with informal construction. Recent estimates of the Ministry of Cities show over 12 million of families living in this situation in Brazil.

To face the problem require actions in two different fronts – i) the refrain, prevention and regularization of informality and ii) the control of supply and flows of affordable residential serviced land and social housing provision. The “Estatuto da Cidade”, a legal peace of legislation recently launched in the country, emphasizes the social function of the property expressed in a whole set of new instruments that open path to a more effective municipal action.

Opportunities in Manaus for promoting urban and legal regularity

The informality of occupation of urban land in Manaus is almost a “tradition” (Ibam, 2001, p. 96), resulting from the lack of urban instruments to face the growth the city has experienced in recent decades. Up to 2002, when a new Master plan has been approved, the city was managed through following an old development plan dating from 1975, and by a whole set of confuse and disarticulated legislation. Informality has resulted from a permanent relaxation on the reinforcement on this legislation that was unable to cope with the fast growing of the city.

The new Master Urban and Environmental Plan prepared by IBAM in 2001 (approved in 2002) foresees Areas of Special Social Interest (as set by the Estatuto da Cidade) and creates the

conditions for the designation of special areas for social housing with specific legislation. An adequate use of these instruments might represent the opportunity for both the regularization of informality, with an increase on service land and low-income housing, and a major control on the prevention of future invasions of land.

The declaration of Areas of Special Social Interest will allow that land subdivision and building follow less strict and ambitious standards, with higher density and progressive servicing and infrastructure, contributing to reduce the cost of service land.

Illegality in the city of Manaus, similar to other cities of Brazil, takes shape in two ways: i) the occupation of peripheral land by less dense social housing developments and by the invasion of land; ii) by a higher density occupation in central areas by favelas. In the case of Manaus the occupation in favelas is mostly concentrated on the Igarapes, generating acute environmental and public health problems.

Uncontrolled land occupation, followed by a lack on investment in infrastructure and on social housing offer able to attend the huge demand of immigrants that came to the city attracted by the employment opportunities offered by the Free Zone of Manaus (established in the 70's) has made the city to hold huge social and environmental problems. Institutional weakness, that includes problems in the reinforcement and planning procedures, even unable full and precise knowledge of the problem at the present. Action of institutional strengthening of the administrative and technical structure of the body responsible for this area – IMPLURB Municipal Institute for Urban Planning) – are of key importance to allow the development of a sustainable strategy that will go beyond the mere punctual treatment of the problem answering emergency situations of major risk. A policy that should be particularly avoided given the high costs involved in mitigating actions, giving rather priority to an integrated intervention of control and prevention of situations.

Under this general framework the Programme has designed an action that aims to support IMPLURB on the improvement of its capacity to prevent and promote the regularization of informality, through the development of a strategy that would assist on the regulation of stock and flows of serviced land for social housing and social housing provision.

This action has the following main aims: i) prevent the occupation of land recovered from the Igarapes designated for public and leisure; ii) promote the revitalization of the immediate surrounding areas of the programme; iii) prevent the spread of informal settlements to avoid the occupation of areas with uses and forms that do not comply with the Master Plan. In order to develop the strategy it is foreseen that is needed: i) to identify and declare the priority Areas of Special Social Interest (AEIS) complying with the Master Plan; ii) to define special guidelines and rules to the AEIS; iii) to identify public land able to be used for low income; iv) to identify and launch housing programs of low income housing, in particular the provision of serviced and infrastructured land for phased housing construction; v) to guarantee better compatibility between the infrastructure extension plans with the identified needs of low income groups by means of improving the coordination among the several responsible public bodies; and vi) the definition of priorities of intervention to regularize the existing informal settlements indicating programs and financing accordingly.

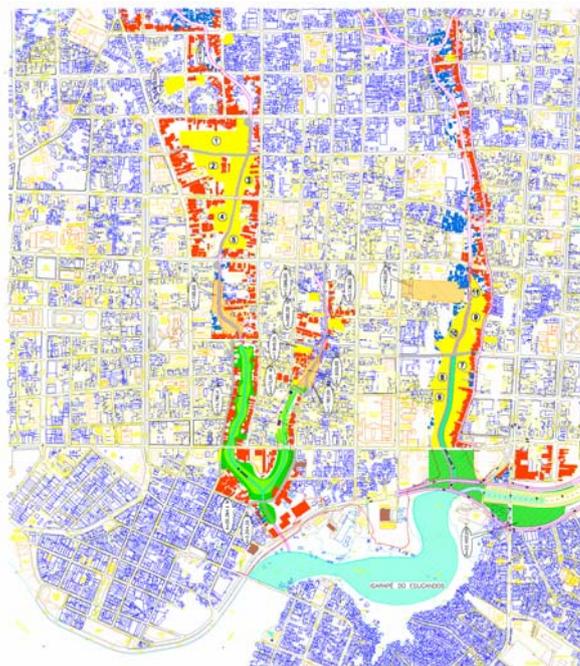
Regarding prevention the program establishes mainly actions that aim at strengthening the capabilities of control and reinforcement to prevent irregularity and lack of compliance with the Master plan, complemented by public campaigns on the content of the Plan and the sanctions connected to its violation. In terms of planning and strategy, either to deal with the problem of

regularization and of regulating the stock and flow of serviced land and housing provision, the program designed a set of activities to be implemented along three years. These include specialized technical assistance, material and equipment that would allow first to collect and update information on the current situation, second the elaboration of a diagnostic followed by the identification of the more suitable legal and urban strategies to deal with the problem, as well as, training. The development of those activities is to be supported by the Municipal and Estate government with responsibility on the matter.

The development of this integrated strategy to confront the informality problem and irregular settlement of Manaus will provide the Municipality with the ability to develop measures that will allow the housing sector to operate by means of facilitating access to serviced subdivided land for housing affordable to low income families, contributing to increase the participation of the private sector, and to increase the efficiency of the market. Reducing the problem of informality and irregularity in the city, the municipality will be able to mitigate their severe effects on the environment.

Social debt versus the environmental problem – The urbanistic solution

The project is set to face at the same time two acute urban problems – the social and the environmental. By solving drainage problems and resettling the people affected by flood occupying the Igarapes margins on neighboring land, the project is able to correct the drainage problems, controlling the impact of Negro river, as well as allow for the improvement the life condition of the local inhabitants without affecting their social networks, employment structure and services.



It takes advantage of a socio-environmental problem, changing it into an urbanistic opportunity of improving the environmental conditions in downtown by enlarging the opportunities of leisure – so scarce in this dense area – with an increase of 1,7 sqm of green area/inhabitant in a park of 59.000 sqm This has resulted from the selection of a drainage alternative solution of a channel with 10.100 sqm that enlarged the areas for public use in the margins of the Igarapes. The park

occupies partially the Manaus and Bittencourt Igarapes, a very central area of Manaus surrounded by important commercial streets, has a number of key urban facilities to support sport and leisure activities amounting a total of 11040 sqm. Those include a local commercial center, kiosks, a stage, food areas, a community pavilion, a center for the elderly, lakes, sport grounds, children playgrounds and a number of treated public spaces and accessibility elements (staircases, bridges to cross the Igarapes, etc) designed to facilitate the permeability of the area from the surrounding fabric. Also improvements on the local street network are included as a means to improve the general accessibility and through traffic conditions and to remove existing discontinuities on the fabric.

Investments in the street network are of three types: i) to complete the street grid interrupted by the Igarapes and other natural features; ii) new local streets to give access to the residential areas dimensioned accordingly to patterns suitable to AEIS; and iii) arterial streets and avenues in the project area, servicing the whole city and identified by a city traffic study. At the margins of Igarape Quarenta a new Avenue was designed to allow its occupation and to facilitate the works during construction. The overall design solution adopted improves accessibility to the area, facilitating its connection to the surrounding center and allowing access to public services and emergency vehicles to the residential areas.

The scarce availability of urban land in downtown has imposed the adoption of a medium to high density solution (677 habitants per hectare²) conformed by a compact structure of open blocks infilling in the existing grid. The blocks are occupied by a total of 1,637 residential units arranged in building blocks of a narrow frontage that occupy the 101,355 sqm of land (74% of these lands are state owned and the remaining 24% are privately owned to be acquired by eminent domain).

Urban Parameters	Total
Total number of residential units	1.637,00
Total built area	104.364,73
Total maximum built footprint	64.687,77
Number of inhabitants	6.875,40
Plot area	21.270,00
Green area	3.073,31
Circulation area	1.585,96
Occupied area	16.610,73
Percentage of green area	14,45%
Circulation area percentage (%)	7,46%
Occupation rate (%) ¹	78,095%
Floor to area ratio	1,05
Net density (hab/ha)	677,292

This typology, very suitable for this central area, creates a strong image able to fill adequately the existing available interstitial plots, and merges the building elements and the urban space in a way as to assign unity in a language with spatial attributes, typical of residential boroughs of

² This is still smaller than the net density of downtown Manaus of 691hab/ha.

central areas. It uses the traditional urban morphological elements of Brazilian cities – the house, the plot, the street, the block, the “vila” (narrow alley), the square, the “largo” (little enclosed square), the “escadarias” (stairways). Building elements are assembled in such a way as surrounding public spaces by groups of residential blocks emphasizing the neighborhood scale and the collective nature of public spaces.



The housing typology adopted for the residential units are according to the Brazilian and international best practices and attend to the legal parameters set by the local regulations. It is based on the following premises:

- i) Use of a solution as close as possible to individual single housing that is more suitable to the topography of the site and the high densities required given the availability of plots; this typology has also the advantage of reducing condominium spaces thus requiring less maintenance and reducing the risks of building deterioration over time;
- ii) the smaller number of layout variation to attend the family requirements of resettled local population and the site topography. This resulted in two different layouts derived from the arrangement of identical interior spaces (with the same configuration and area). Two modules of 3,30 m x 8,10 m, respectively for living room, toilet and kitchen and the other for the bedrooms, were used. Those modules were arranged in two ways: side by side forming single floor units or on top of each other to form two floor units (that are so common in downtown Manaus), having always direct access from the ground floor. Those units are combined in two forms accordingly to the

topographic site conditions – in individual two floor units or in blocks of ground floor flats with two floor units on top;

- iii) both layouts have the same net area – this gives an area of 50 sqm that is above the commonly adopted value for social housing of 7 sqm/inhabitant, considering that the average family size in the area is of 4,5 inhabitants and 25% above the size of low income housing established by local legislation;
- iv) in order to attend the conditions of minimum cost and to respond the financial restrictions of the project, the typology allows for the phased expansion and upgrading of the houses by the beneficiaries. They will receive the basic house at no cost and are expected to maintain and improve it with their own resources. Its evolution stage has been determined by a study of cost efficiency that indicated that the best solution was to deliver the units with living room, kitchen, toilet, two bedrooms and two verandas, a total of 11 sqm/inhabitants. The units have adequate privacy conditions (sharing walls between bedrooms) and good environmental comfort (cross ventilation provided by the verandas, Venetian doors and adequate floor to ceiling height).

Conclusions

The Igarapes project demonstrate that to bring benefits to the whole city of Manaus, contributing to improve for its environmental and urban requalification, with particular incidence on the city centre and its immediate surrounding it is necessary to deal squarely with the social problems that created the deteriorated conditions in the first place.

Under this approach, the Program not only solve an urban problem but also contributes to reduce social and spatial asymmetries, promoting more equity in the access to public services and infrastructure that are so fundamental to the local population.

Direct social and environmental impacts of the investments are measured by the increase on the access to public services, social facilities – particularly of leisure, and by the improvement of the sanitation conditions and its impact on public health. The long term and definitive effects are expected to be expressed in the improvement of the housing conditions and on the level of legal and urban regularity in the city, particularly accomplished by activities of the strengthening of the management and planning competence of local administration to deal with strategically with urban development, controlling aspects of stock and flow of serviced land and social housing provision and reducing overall informality and urban irregularity.

Critical to the sustainability of the solutions financed by the Program is the promotion of an adequate urban and legal framework for land development that facilitates the production of affordable land for residential uses, thus reducing the illegal occupation of land. This will benefit the entire population of Manaus and will constitute an increment on community social capital, placing the city in a better position vis a vis the urban economy, guaranteeing the required conditions for people to invest safely in their properties.