

Land regularization and quality urban spaces

Ana Paula Seraphim, Maria do Carmo Bezerra
Architecture and Urbanism College, University of Brasília. Brazil
E-mail: anapaula313@gmail.com, mdclbezerra@gmail.com

Abstract. *The policy of urban land regularization in Brazil has its legal basis expressed in the Federal Law no. 11.977/2009. This norm contemplates a multidimensional understanding of the conditions necessary for the integration of illegal settlements into the formal city. It goes beyond the granting of land title, since it establishes that the urban, environmental and social dimensions must also be taken into account in the regularization projects. Thus, quality of life and environmental quality aspects are expected to be present in the regulated areas, this is not verified by official surveys, where basic service deficiency and environmental impacts are identified. The present study aims to objectify the evaluation of these projects, verifying which elements contribute to the urban and environmental spatial qualification, providing a qualified feedback to the projects. As method, we explored measures necessary to the establishment of the regularization process in the urban and environmental dimensions and reviewed concepts of quality of life and environmental quality to identify measures related to them. An evaluation framework was organized and used to analyze a project considered a successful example, the 'Cantinho do Céu', in an area of Protection and Recovery of Water Supplies in the city of São Paulo. It was possible to verify how the implemented interventions are related to the regularization dimensions defined in law and with quality of life and environmental quality aspects. This 'Cantinho do Céu' project presented a proportionality between the environmental and urban dimensions, which partially explains its success.*

Keywords: Quality of urban space, Urban land regularization, Environmental quality and Quality of life.

Introduction

In Brazil, urban growth's ascending curve, associated with the Public Power's small capacity to produce efficient responses, resulted in a low quality urbanization, marked by a housing, infrastructure and mobility deficit with a high rate of informality. Brazil's urban population grew 58% between 1980 and 2000, while the population in favelas and irregular precarious land subdivisions grew 279% in the same period (Bueno, 2005).

The population, facing a lack of regular housings, occupied different areas which were unoccupied, for being inappropriate under either the urban or environmental perspectives,

and, thus, faced major environmental problems in these informal settlements. These are areas that, due to their environmental fragility and precarious deployment, face risks related to landslides, floods and erosive processes.

These occupations' morphological characteristics vary in function of the physical sites, the income rates and the way in which the occupation started. When they emerge spontaneously, they become more unorganized and precarious, while, when they are implemented through irregular or clandestine allotments, they present a better spatial organization. Although they compose a varied set of typologies, these areas are still similar in their contrasts to the legal city, not following

the urban and environmental normatization and presenting social, economic and environmental problems (Ávila & Ferreira, 2016).

When these occupations are already consolidated², the simple removal of the residents is usually not a viable option, due to the fundamental social right to housing³, breaking of neighborhood ties, level of anthropization reached and the lack of other city areas with the same degree of accessibility to move them.

In view of these considerations, the establishment of the residents in the site need to take into account the urban, environmental and social dimensions, before promoting the property's regularization. Exclusively guaranteeing the land registration represents neglecting the occupations' precarious conditions and their risks. Nevertheless, promoting only urban improvements, leaving out the land registry in favor of the resident, perpetuates the insecurity of the ownership and a whole chain of social problems (Alfonsin, 1997).

The legal basis that dictates the regularization process in Brazil take into consideration these issues, through the Federal Law no. 11,977/2009, which consecrated, in its article 46, the concept of multidimensionality in the land regularization, which follows:

The land regularization consists in a set of judiciary, urban, environmental and social measures, which aim for the regularization of irregular settlements and the land ownership of their occupants, in order to guarantee the social right to housing, the full development of the urban properties' social function, and the right to an ecologically balanced environment.

On May 31st, 2017, Brazil's Senate approved the bill of the President's initiative Medida Provisória 759, which changes the above mentioned legislation. This law will revert this multidimensional concept and reduce the necessary procedures of the process of land regularization. However, because of its recent approval, it is difficult to further analyze its impacts.

Even though this multidimensional concept is still in force, the disseminated data and evaluation about land regularization processes are still limited to the study of 'number of

granted land titles' and 'beneficiary families' (Ministério Das Cidades e Aliança das Cidades, 2009). This scenario may signal either an emphasis on the juridical dimension in detriment of the others, or an omission in the evaluation of the other dimensions. None of these situations is ideal.

Starting from the premise that the complete evaluation of the undertaken regularization actions still does not occur as fully as it could, this work proposes a qualitative evaluation methodology of the urban and environmental dimensions of the regularization process. These two dimensions were chosen due to the understanding that they are more directly related to the changes in territory and over which actions could come to promote an improvement on the quality of life and the quality of the environment for these irregular settlements.

With this purpose, this research was divided in three sections. The first one, the theoretical framework, analyzes actions expected of the environmental and urban dimension and the concepts of quality of life and urban environmental quality in order to systematize the parameters found in a form of an analysis table. The second introduces the methodology for implementing this analysis table in the evaluation of an area which has undergone a regularization process. Finally, the third one presents the analysis and results of a study case.

Theoretical Framework

The urban and environmental dimensions of land regularization and its legal basis

The regularization process and its operationalization are complex and difficult to understand. Due to the extensive set of laws that dictate it in Brazil⁴, its dispositions are found in the form of an entangled group of definitions, principles, conduction of studies and administrative procedures. In order to clarify this process, a study by Bezerra and Chaer (2014), which attempts to systematize the stages of the regularization process, and the process' legal basis were reviewed to help the construction of the regularization process diagram, shown in Table 1. This was

important to clarify which stage has a greater impact on territorial organization and, in this way, can mostly influence the environmental and life quality of the settlements. The stage identified with these characteristics is the 'Urban Design', which will be the focus of the evaluation elaborated here.

Starting from a study by Chaer (2016), which listed actions comprising the dimensions of the land regularization process after an extensive study on the legal basis, we assembled the required actions related to the environmental and urban dimensions in the 'Urban Design' stage. It must be taken into account that the legal basis of the regularization process highlights the importance of qualifying the informal occupations by keeping, wherever and whenever possible, the existing characteristics and avoiding removals or evictions. This principle is supported by instruments that make usual urbanistic rules more flexible to the existing conditions of these settlements, which makes the assembled required actions basic.

The required actions related with the environmental dimension can be arranged in two groups: (1) required actions to adapt the elements of land division to the site's natural conditions and (2) required actions for the promotion of environmental balance, in the sense of minimizing the pressure over the natural resources (Chaer, 2016). This is shown in Table 2, right column.

The required actions related with the urban dimension can be separated in two groups: (1) required actions to adapt the elements of land division to the basic necessities of the inhabitants and (2) required actions of basic infrastructure supply, like public illumination, sewage treatment, drainage of pluvial waters and water and electricity supply (Chaer, 2016). This can be seen in Table 2, left column.

Actions associated with quality of life and environmental quality

The concepts of quality of life and environmental quality, under the perspective of the city's physical dimension, is supported by a broad but contradictory literature. In any case, taking the diversity of researchers, government institutions and international organizations

theories, a search for a synthesis of what is current was made.

There is no consensus on the historical origin of the application of the concept quality of life to the city context. One of its first appearance goes back to the XIXth century, on the work of Max von Pettenkoffer "The value of Health to a City", which is closely associated to the social hygiene movement (Guimarães, 2005). However, this term began to be more widely used in the end of the 1970's and the start of the 1980's, associated with subjective, qualitative and appreciative aspects of urban environment, based in the individuals' and groups' perceptions in relation to the quality of life. In this same period, this concept received a large influence from the concerns with natural resources, the environment and social inequality.

The 1990's were marked by important conferences in the area of environment and human settlements, where emerged an aggregator concept of ideas of greater articulation between the natural and anthropic processes and where the idea of quality of life and environmental quality were underlying. Since then, the concept of sustainability starts being advocated by different areas of knowledge, as one that encompasses social, natural and economic aspects.

Through this union of fronts, the concept of quality of life increasingly becomes the key element of the concept of environmental quality (Nahas, Pereira, Esteves and Gonçalves, 2006). The interdependence between them comes from the fact that the 'life' of the term 'quality of life' is bounded to its nourisher environment, of the term 'environmental quality'. According to Kliass (2002), urban environmental quality is the attribute of the urban environment, which guarantees the life of the citizens within patterns of quality, both in the biological and sociocultural aspects.

However, since the urban and environmental thematic come from different epistemological trajectories, their matrices of values and ways of thinking lead to actions grounded on differentiated principles and logics. Conflict has been more recurrent than consensus.

To help in the evaluation of programs which aim at the promotion of quality of life and

environmental quality, the translation of these concepts into operative terms is important. Recently, studies of Santos & Hardt (2013) attempt to systemize actions that would fit in the concept of environmental quality and urban quality of life. In these studies, environmental quality was analyzed through the natural system characteristics, which includes aspects related to the nature's balance state, while quality of life was analyzed using characteristics of the anthropic system, which includes aspects of the territorial and socioeconomic contexts (Santos e Hardt 2013).

The natural system encompasses components of the physical order, such as climate, air, water, soil and subsoil, and the ones of biological origin, like fauna and flora. While the anthropic system encompasses actions related to the use and occupation of the soil, offer of infrastructure, urban services, sociocultural conditions and productive sectors.

It is possible to make a connection between these systems and the dimensions of regularization, associating the natural system with the environmental dimension and the anthropic system with the urban dimension. From this association, it was possible to seek complementary actions in the urban quality indicators of UN-HABITAT (UN-Habitat, 2009), Geo Cidades (PNUMA, 2004) and of the Brazilian Institute of Statistical Geography (IBGE, 2012). The result of this gathering, crossed with the regularization dimensions, is shown in Table 3.

Methodology of Analysis

Studying the Brazilian legal requirements for regularization processes and some indicators of urban quality, it was possible to assemble objective measures to guide the evaluation of the urban regularization projects. These measures are disclosed in Tables 2 and 3.

Both tables present the urban and environmental dimension and were divided in three types of general measures: (1) measures of adequacy of occupation and land use, (2) measures of provision of infrastructure and (3) measures of promotion of environmental balance, which is only related to the

environmental quality. Table 2 presents the required measures, which are basic actions expected of the project, so it follows the legal requirements. While Table 3 presents complementary measures that can improve local living and environmental conditions.

The use of these tables can assist in evaluating if any of the different dimensions has greater emphasis in the projects, if some group of general measures occurs more than others and if the implemented measures are only those required or also the complementary ones. Both types of measures are necessary for putting the land regularization in practice in an effective way.

Case Study: Núcleo Cantinho do Céu

The project selected for evaluation was the Núcleo Cantinho do Céu in the south zone of São Paulo, Brazil, next to the left bank of the reservoir Billings, an environmentally protected area for sources of clean water supply. It has a significantly dense occupation, mainly composed by low income families, being a source of pollution to the reservoir (Cheriatto, 2012).

This study case was selected because it covers problematics in the different analyzed dimensions and because its urban design has been considered a case of improvement in both life and environmental quality.

The urbanization works, which started in 2008 and are still on course, are a part of the reservoir program - Programa Mananciais, which has as objectives controlling the hydric pollution and improving the life conditions of the inhabitants of the region, through urban infrastructure interventions. The urban design embraces the whole neighborhood perimeter, which is composed of three neighborhoods: Cantinho do Céu, Residencial dos Lagos and Jardim Gaivota.

By analyzing the preliminary design, developed in 2007 by the consortium JNS-HagaPlan, and the detailed design developed by the urban design office Boldarini Arquitetura e Urbanismo6 it was possible to observe several of the measures applied.

According to the environmental legislation

in Brazil, a range of 50m surrounding the banks of the Reservoir should have the housings removed. Nonetheless, the design studied compensation conditions, extending the protection range in some areas, in order to avoid the clearance of others. The new Permanent Preservation Area (Área de Preservação Permanente – APP) has an area larger than the one mandated by the environmental law and, also, an ecological park was created for environmental compensation of the non-cleared areas.

Some removals were still necessary and, to define which, technical criteria were used with the observations of: impossibility of sanitary sewage system; clearances of the drainage lines; complementation of the road system; elimination of risk areas; and clearance of areas for urban equipment and for creating resettlement areas. Out of a total of 9,789 resident families, 3,052 were relocated to new habitational units, some inside the regularization area and others outside the current neighborhood perimeter, but still in the proximities (JNS e Haga Plan, 2007).

The adopted solution for these removals opened space for the conformation of the park Parque Linear, a group of public open spaces with areas for socializing, sports and leisure. The park associates recreational and leisure activities to the preservation of the reservoir banks and to the maintenance and reconstitution of native species of plants, avoiding the silting of the reservoir. This park is also a form of inhibition against future occupations of the APP.

Besides the Parque Linear, other green areas were designed for the recovery of the environmental balance and prevention of future occupations. These areas are composed by the Ecological Park and an area located under the transmission line protected range, where new trees will be planted and a community garden will be created.

Where before were narrow routes with significant declivities, new road connections were designed. Today, the settlement's residents spend, in each direction when travelling to work, from an hour and a half to two hours. The nearest hospital and commercial center are in a time distance of one hour, when using the available public transportation.

To improve the situation, more accesses to the neighborhoods were designed and paving was defined according to the roads' hierarchy and drainage conditions. Asphalt was selected for streets with larger movement, concrete blocks pavement in the smaller ones and permeable pavement in the ones with only pedestrian circulation. With these changes, access was enabled for public transportation and heavy vehicles. In addition, new bus lines and the construction of a new bus terminal were planned.

Regarding the provision of urban infrastructure, the following were implemented: changes in the road meshes; implementation of waste collection; water supply lines; a sanitary sewage system; and a system to redirect the sewer to a treatment station outside the reservoir area.

Regarding the drainage, the urban proposal predicted an expansion of the green area, maintaining the natural conditions of permeability, and the scaling of pluvial water networks in the new and old roadways, where 5,327.90m of new galleries and different superficial drainage systems were designed. The declivity of the roads was set to the center of the roadways, in order to avoid that the pluvial waters would leak into the houses (Soluções para Cidades, 2013).

According to the parameters used to evaluate the project, it was possible to observe that the design did not put a greater emphasis on the urban dimension over the environmental one, or the other way around. However, few complementary measures were implemented. Of this few, more measures were of the environmental dimension and for the adequacy of the occupation and land use, as can be seen in table 4, where the measures that could be ascertained are marked with an 'x'.

Conclusion

Establishing criteria to be used as references during the evaluation of projects is not an easy task, mainly because the list of possibilities is long and the choice of some in detriment to others must be aligned with the expected

objectives for the target population. In this work, the evaluation related to the reach of the urban and environmental dimensions of the land regularization process through the achievement of measures which promoted quality of life and of the environment.

Using these defined criteria, displayed in Table 2 and 3, it was possible to verify that the interventions designed for the neighborhood Cantinho do Céu have a high degree of concordance to these criteria, especially the basic ones, requested by law, and a proportionality between the environmental and urban dimensions, which may partially explain its success.

However, the complementary measures were mostly not met, which can give hints on the fulfillment of these measures by other projects not as well reputed as this one. Also, analyzing the complementary measures, it was possible to find a light emphasis in what refers to environmental quality, in detriment of what relates to quality of life. This does not necessarily indicate a greater attention to the environmental dimension, because it can also indicate that the required environmental measures are more basic than the urban ones, leading to further implementation of complementary measures in this dimension. To better understand the case, further investigations need to be made in this regard. Despite the amplitude of the Brazilian land regularization legal basis, the practice that has been growing in the country, after 16 years of the implementation of the City Statute (Law no. 10.257/2001), which established the regularization as an urbanistic instrument, is still far from being consolidated as a path that brings the social, urban, environmental and juridical dimensions together in order to include irregular areas in the formal city effectively. Reducing the impacts brought by informality.

Along these lines, the new legislation, MP 759/2016, can bring setbacks in what concerns the reductionism of the problematic of the regularization process. However, it also seems to establish legality to a recurrent and ongoing practice.

In this sense, it is important to emphasize that the land regularization is a curative

measure for the informality. But that there are also preventive measures, which can reduce the dynamics that generate the informality and that should be used to a greater extent. Studies that investigate informality from the perspective of the land market show that the clandestine sales of undeveloped land offers more profits than sales of urbanized land by the formal market. This happens because the landowner of the informal land anticipates in the sale price services that are expected to be introduced in the future, usually by the public authorities (Morales and Smolka, 2005). This, together with the scarcity of urbanized land, ends up generating a cycle of informality.

The prevention of irregularity depends on the advancement of urban policies that affect several areas, in an integrated way. The housing and control policies, together with land regularization programs, should respond in an integrated and connected way to the need for housing.

Notes

1According to the Brazilian Federal Law no. 6,766/79, irregular allotments are the ones which had an enrollment in the official organ for approval, but didn't finalize the process, while the clandestine ones were implemented without following any step of the approval process.

2According to article 47, of the Federal Law no. 11,977/2009, consolidated urban areas are those with density superior to 50 inhabitants by hectare, road mesh implemented and at least 2 from the following infrastructure implemented: pluvial water drainage; sewage treatment; drinking water supply; electrical energy distribution; urban cleaning and solid waste gathering.

3One among the social rights predicted in article 6, "caput", of the Brazilian Federal Constitution.

4The legal instruments that today constitute, together, the policy of urban land regularization in Brazil are: the Estatuto da Cidade - Federal Law no. 10.257/2001, Federal Law no. 10,931/2004, Federal Law no. 11,481/2007, Federal Law no. 11,888/2008, Federal Law

no. 11,977/2009 and Resolution no. 369/2006 of the National Council of the Environment – CONAMA.

5With the exception of public illumination, there is a consensus on the definition of basic infrastructure, under Federal Law no. 11,977/2009

6In 2008 the construction work was put in charge of the consortium Schahin Engenharia and Carioca

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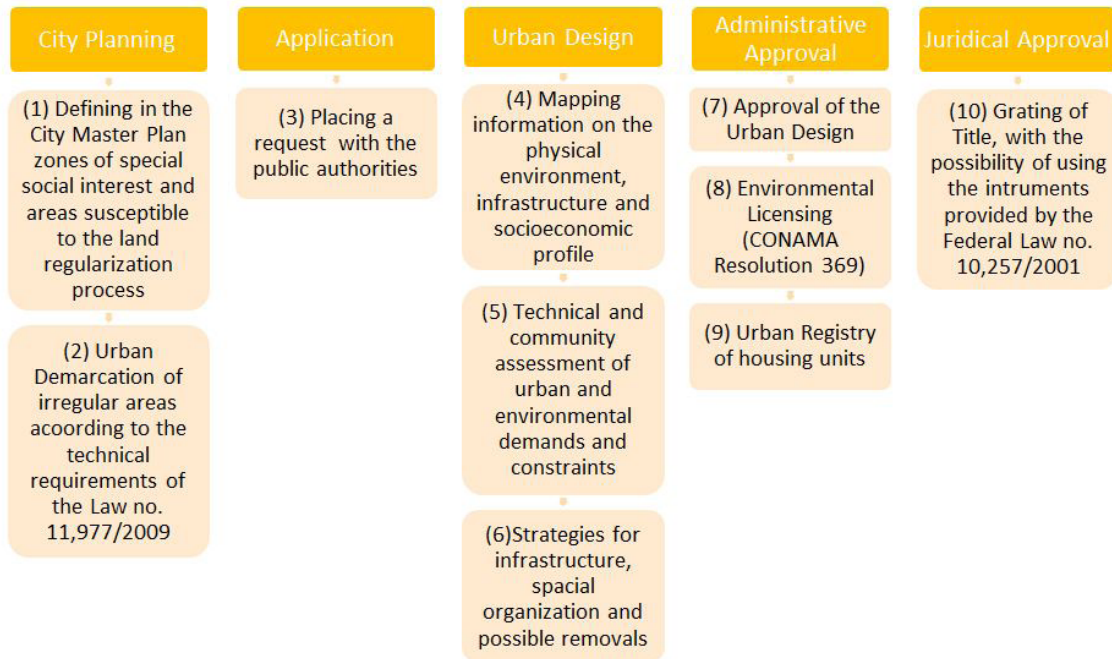


Figure 1. Stages of the regularization process. Source: Author (2017)

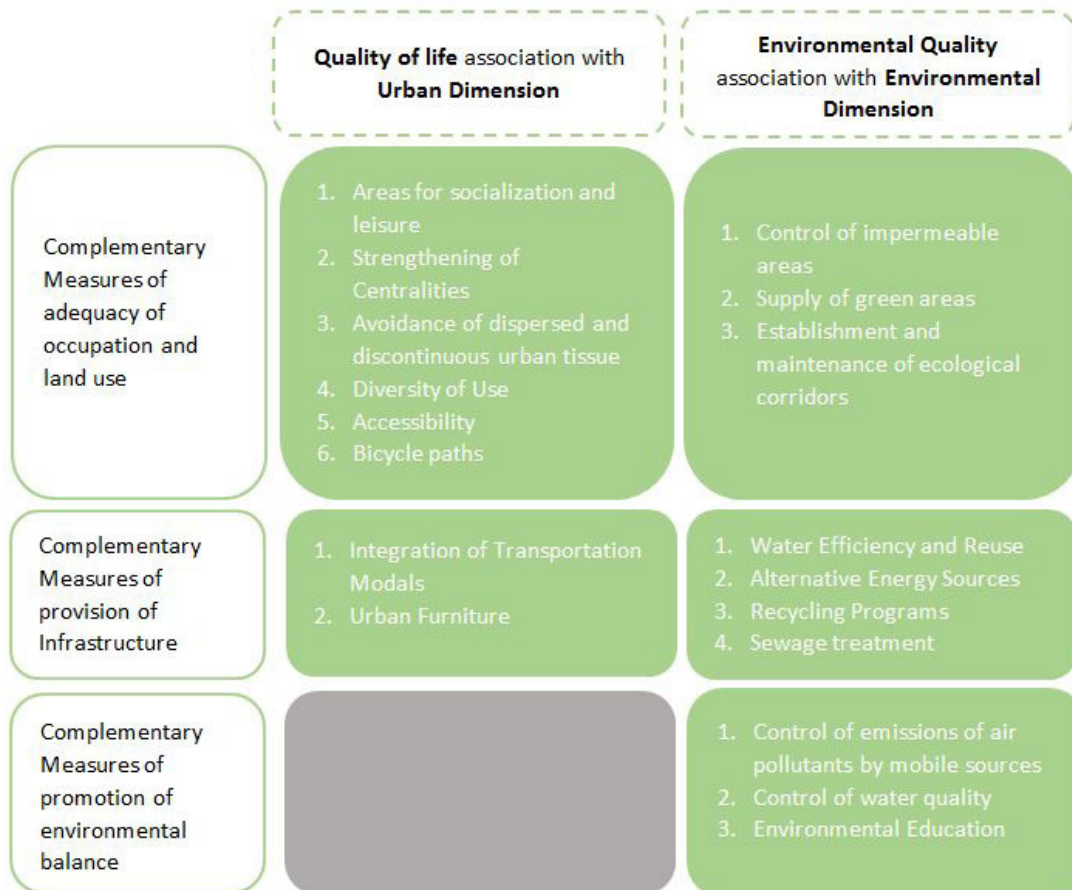


Figure 3. Complementary Measures of Quality of Life and Environmental Quality associated with the urban and environmental dimensions. Source: Author (2017)

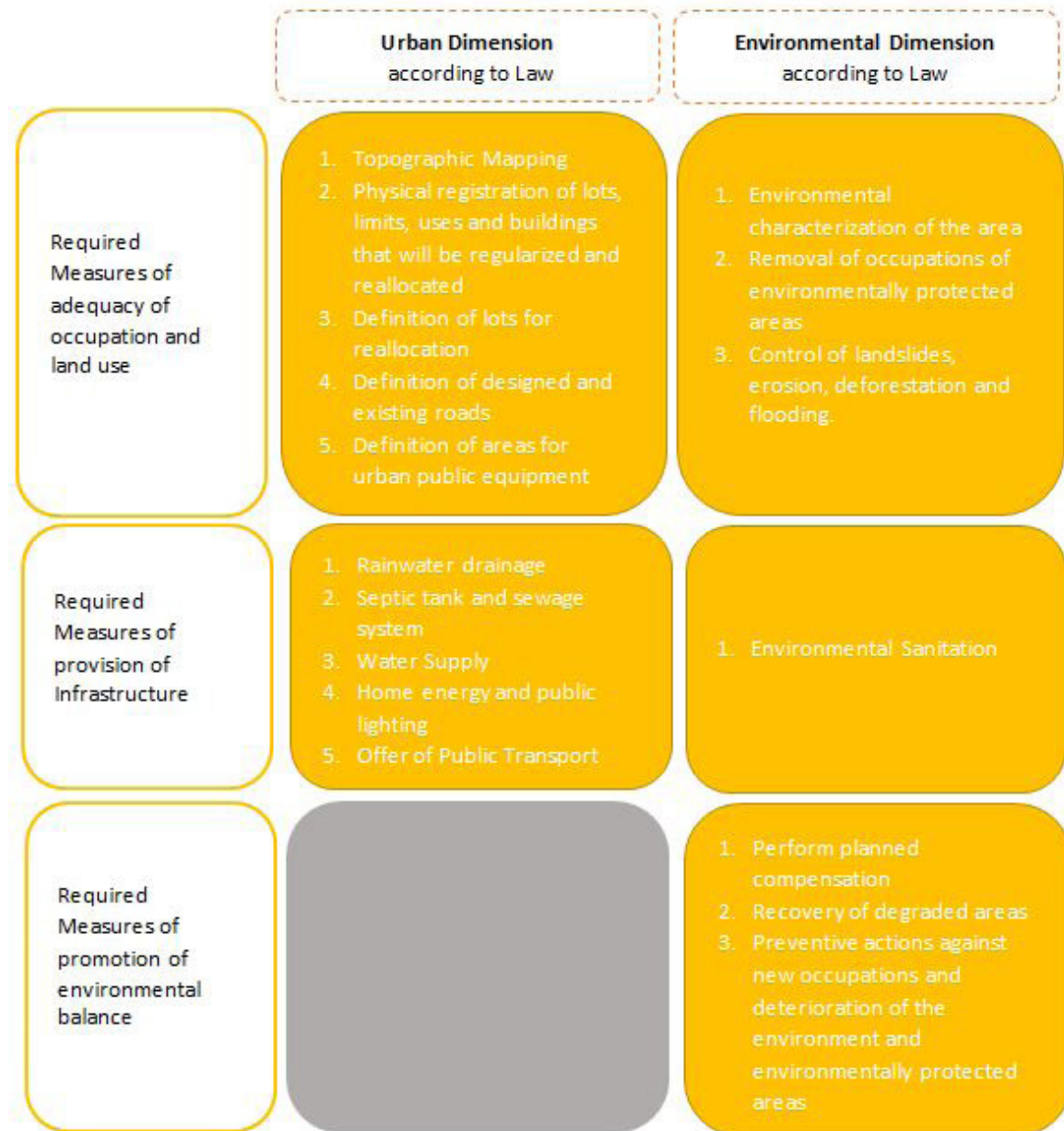


Figure 2. Required Measures associated with the urban and environmental dimensions according to law. Source: Author (2017)

| Measures of adequacy of occupation and land use | | | |
|--|---|---|---|
| Required | | Complementary | |
| Topographic Mapping | X | Areas for socialization and leisure | X |
| Physical registration of lots, limits, uses and buildings that will be regularized and reallocated | X | Strengthening of Centralities | |
| Definition of lots for reallocation | X | Avoidance of dispersed and discontinuous urban tissue | |
| Definition of designed and existing roads | X | Diversity of Use | |
| Definition of areas for urban public equipment | X | Accessibility | |
| | | Bicycle paths | |
| Measures of provision of Infrastructure | | | |
| Required | | Complementary | |
| Rainwater drainage | X | Integration of Transportation Modals | |
| Septic tank or sewage system | X | | |
| Water Supply | X | Urban Furniture | |
| Home energy and public lighting | X | | |
| Offer of public transport | X | | |

| Measures of adequacy of occupation and land use | | | |
|---|---|--|---|
| Required | | Complementary | |
| Environmental characterization of the area | X | Control of impermeable areas | X |
| Removal of occupations of environmentally protected areas | X | Supply of green areas | X |
| Control of landslides, erosion, deforestation and flooding | X | Establishment and maintenance of ecological corridors | |
| Measures of provision of Infrastructure | | | |
| Required | | Complementary | |
| Environmental Sanitation | X | Water Efficiency and Reuse | |
| | | Alternative Energy Sources | |
| | | Recycling Programs | |
| | | Sewage treatment | X |
| Measures of promotion of environmental balance | | | |
| Required | | Complementary | |
| Perform planned compensation | X | Environmental Education | |
| Recovery of degraded areas | X | Control of water quality | |
| Preventive actions against new occupations and deterioration of the environment and environmentally protected areas | X | Control of emissions of air pollutants by mobile sources | |

Figure 4. Ascertained, required and complementary measures of the project Núcleo Cantinho do Céu. Source: Author (2017)



Figure 5. Rendered images of the intervention. Source: Boldarini Arquitetos e Associados, 2015, (<http://www.arqbacana.com.br/>) accessed December 02nd 2015.

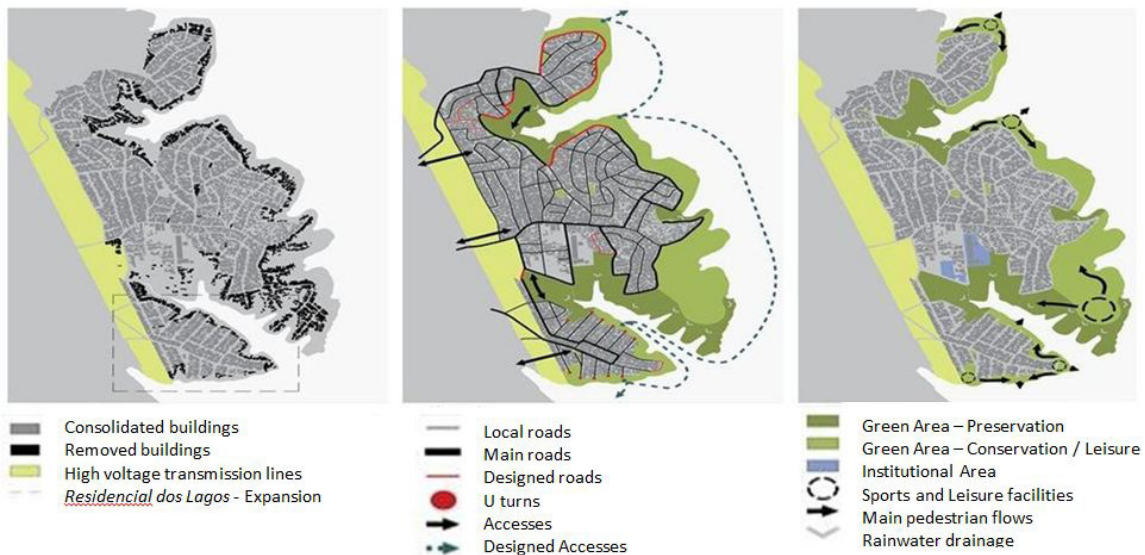


Figure 6. Urbanization of the Núcleo Cantinho do Céu. Source: Boldarini Arquitetos e Associados, 2015, (<http://www.archdaily.com.br/>) accessed December 02nd 2015