



Urban Housing as Possibilities of Sustainable Communities

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ABSTRACT: The housing policies of Program Minha Casa Minha Vida have produced social housing in Brazil, generating urban developments and housing projects in several cities. Most of them are situated in areas of urban sprawl, generating displaced urban appendices of the consolidated urban fabric. This paper presents a case study in Passo Fundo (RS) that combines private construction with public investments, with the characteristic diversity of typologies, building technology and streamlined the gradual provision of community facilities. The analysis is based in methods and concepts of full valuation of residential areas proposed by Montaner, Muxi & Falagan (2011). In preliminary investigation, the new development presents a number of facilities and sustainable improvements such as: landscape, infrastructure and urban facilities: - paving roads with walks for pedestrians; - School child education; - Elementary school and sport center under construction; - public transportation; - Health equipment; - Shed recycling waste; - Environmental preservation area along the stream; Set and housing unit: - differentiated housing typologies: terraced houses, detached houses, houses with apartments; - Sanitation in the condos themselves; - Housing units with parking for vehicles; - Use of solar heating for water; - Balconies in the apartments. As a result, it appears that even in private enterprises, the tools "to inhabit the present", that consider housing as part of urban design can contribute to the resulting urban morphology of new landscapes get better quality and sustainability, provided that effect the corresponding public housing policies.

Keywords housing policies, typological diversity, community facilities, urban landscape.

1. INTRODUCTION

Recent public policies for social interest housing in Brazil have created scenery of new condominiums and lots in the Brazilian cities outskirts. The urban morphology of the outskirts rebuilds itself and standard complexes of repetitive housing units are added to the informal space. The urban form, intentionally produced, moves the unique and unexpected from the self-construction, intending to standardize and meet the demands that are suppressed on a massive and questionable reproduction of ghettos with no sense of belonging to the cities. According to Maricato (2011), it is verified that despite the criticism to the process of the social housing construction implemented in the country in the late twentieth century, the dimensions, uniformity and distancing of urban facilities.

In Passo Fundo, Rio Grande do Sul, the low-income housing in study differentiates from others by being located in a legal expansion area of the city, planned in its Master Plan of Integrated Development (2006) and by showing varied housing typologies, constructive system that is differentiated with relation to the standard constructions of conventional housing programs and by hosting different social housing fractions. In a city which shows positive population growth, these elements presuppose some differentiation when building new landscapes, thus the lot and the low-income housing analyzed are found in an expansion area of the city.

1.1 Definition of the theme

This work approaches the formation of new urban landscapes from the implementation of social housing centers in peripheral areas of the Brazilian medium-sized city. Studies by Maricato (2011), Bonduki et al. (2012) and other Brazilian researchers evaluate the dynamics of the housing policy from the implementation of the Ministry of the Cities, the resume of housing financing and urban development. They emphasize the difficulty of evaluating their effectiveness towards the reduction of the deficit; the qualification of the habitat and the continuity of programs due to the diversity of situations in the territory, because of the lack of reliable and independent operational and administrative structures of political management in all federal bodies.

Program Minha Casa Minha Vida (MCMV-My Home My Life Program) was a mark in housing policies because it allocates a high volume of direct subsidies for purchase and giving priority to low-income families, according to the Housing National Plan. The families with an income of up to three minimum wages (group 1) received higher subsidies, and those with an income from three to six minimum wages received lower subsidies (group 2). Yet, the families with an income from six to ten minimum wages (group 3) were benefited from the reduction of taxes and other advantages. With relation to the previous projects, there was an excessive stretching of the income groups, benefiting segments of the medium class and generating market for the private sector. The high volume of subsidies direct to housing is the backbone of the MCMV social program, making the policies uncertain, since the suspension of subsidies will paralyze the whole system in its surroundings (Meyer, 2014: 117).

According to Shimbo (2012), when analyzing the role of the construction companies in this process, "the production of the cities in Brazil has deeply changed in this early twenty-

first century. In a period of five years, mostly between 2006 and 2010, large construction and developer companies that started to offer housing for low-income population provided a fast pace towards the verticalization and spreading of the urban morphology”.

Nevertheless, more demanding of the program and Caixa Econômica Federal (Federal Public Bank) is observed with relation to the insertion and urban quality. Meyer (2014) points that the projects presented must contemplate the local urban issues of the business: transportation, lighting, garbage collection, water supply and energy, sewage solution and insertion in the urban net. Program MCMV 2 demanded to provide drainage, paved access routes, sidewalks, curbstone and gullies, besides the “project environmental adaptation”. As for location, it limits to demand the “location of the terrain in the urban net or in the expansion area that meets the requirements established by the Ministry of the Cities, by observing the Master Plan, when there is one”, and the demanding or commitment of the local public power of installing or improving equipment and services related to education, health, leisure and public transportation. “Anyway, when moving the population to distant locals, this model saturates the road system, degrades the environment and segregates the dwellers socially, making the access to job opportunities and services more difficult, which constitutes the greatest weakness of program MCMV” (Meyer, 2014).

In Passo Fundo, a medium-sized city in the north of Rio Grande do Sul, Brazil, in the decades from 2000 to 2012, the social housing programs began to be carried out by the municipal government with the support of federal resources and the local counterpart, being accomplished by private construction companies. In program Minha Casa Minha Vida, the most current low-income housing is receiving complete urbanization such as road network and paved sidewalks, public lighting and community equipment nearby.

1.2 Case in study: Jardins Nativos

The objective of this research is the low-income housing named Jardins Nativos (Native Gardens), housing programs of social interest of program Minha Casa Minha Vida, located in Vila Donária, Sector 8 – District Santa Marta, in a peripheral area, which is 6 km distant from downtown of Passo Fundo. In this area it is planned the urban expansion and housing densification, according to the Master Plan of Integrated Development (2006) and the urban municipal plan (2012) approved by the Inter-American Bank of Development. In this area, more recent housing plans that present differentials as for housing typologies and construction technologies carried out in conventional lots, are located.

Sector 08 counts on an area of 5.61 km², consisting of an urban expansion area, where in 2010 it counted on a population of 5.355 inhabitants and a demographic density of 954.55 inhabitants/km² (IBGE, 2010). This sector is receiving investments from the municipal urban plan, where it is a priority for the implementation of social projects. Several housing projects, denominated Vila Donária (2010 and previous years), were implemented in it. However, there are still few urban equipment: fundamental and high schools, elementary school, health unit, social assistance center, churches and small-sized business. This sector does not present public green areas nor public equipment for sports or leisure activities, but some private clubs only (Fig. 1).

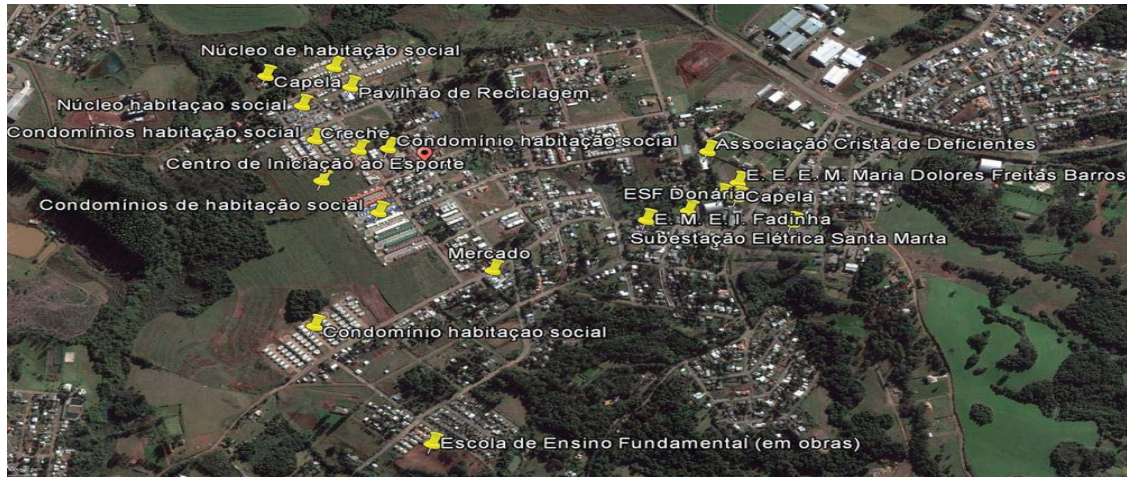


Figure . Panoramic view of Vila Donária and condominium Jardins Nativos. Source: Elaboration of the authors on the satellite photograph of Google Maps, 2016

Condominium Jardins Nativos has been implemented since 2012 and it is subdivided into 17 closed condominiums, where each of them will count on 24 housing units, in different modalities (isolated, ground twin houses, story-buildings), and that it will be financed through a partnership between the City Hall and Caixa Econômica Federal by means of Program Minha Casa Minha Vida. It is located in an area of 40 hectares, delimited by streets Dona Georgina Schell, Muçum and Miguelzinho Vargas, in the southwest of the neighborhood, with preservation area to the west. The area was designed as Special Zone of Social Interest in the legislations of 2009, 2010 and 2011.

The infrastructure of the road network has been built, part by the incorporating company, and part by the City Hall. The electricity grid was implemented by the concessionaire and the sanitary sewage system of each condominium makes part of the infrastructure Project of Condominium Jardins Nativos. It has been implemented by the constructor that is responsible for the work. Parcels of the area are donated to the City Hall for streets arrangements, the construction of elementary schools and sports center.

In an initial assessment of the area where the low-income housing researched (2016) is, we can list the following infrastructures and equipment existent or recently implemented: Landscape, infrastructure and urban equipment: paving of lanes with sidewalks for pedestrians; elementary schools; fundamental schools, work in progress; sports initiation center in projects; public transportation; health equipment; shed for garbage recycling; and environmental preservation area together with a stream. Unit and low-income housing: differentiated housing typologies: twin houses, isolated houses, story-buildings; use of typologies and varied coloring for the construction of condominium identities; sanitation in the condominiums; housing units with parking for vehicles; use of solar heating for water; and balconies in the apartments.

1.3 Methodological procedures

This study proposes a research based on the analysis of housing typologies and construction systems, their integration or as opposed to the pre-existent housing and the formation of the municipal and local urban landscape. The housing areas will be studied in as for their intra-urban aspects as well and their social housing programs. Considering that the new low-income housing of this sector has been encouraged by the municipal

urban plan, the main hypothesis is that there will be a fast urban fabric constitution with different uses surrounding the mono-functional area (housing). In contrast with and as opposed to the pre-existent city and these low-income housing with a differentiated morphology, the low-income housing arises with a new polarity in the city. The dwellers demand the construction of urban spaces fitted with infrastructure in the neighborhood, like community services and equipment as well as full integration to all spaces in the city.

The work is in progress, based on Werna (2001), a methodology that combines the evaluation of the product – in this case, the housing unit and its collective, with an assessment of the process that includes an analysis of the institutional mechanisms used by the municipality, that is, the programs adopted, their implementations in urban areas and the evaluation of the social agents involved in the housing acquisition. After an overall characterization of the low-income housing its urban insertion will be assessed, where urban insertion is understood as a form the uni and multi-familiar housing units are linked with and in the urban space, considering its location, adaptation to its surroundings, its connections with infrastructures and public services.

In the analysis of the low-income housing, methods and basic concepts of full valuation of housing areas proposed by Montaner et al. (2011) will be used, in relation to the theory of “Inhabiting the present”, where the authors reflect on the housing unit in a contemporaneous context of cultural, social and technological changes, grouping a series of issues in four great areas: 1) society, 2) city, 3) technology and 4) resources.

With relation to Society (1) contemporaneous, the authors emphasize re-adaptation and differentiation of the Family groups composition; where the position of the supportive family chief, mother and large number of children must be reviewed, and whose structure is no longer rigid and hierarchical; the residence begins to be a space of work and storage. It is observed that the new social contemporaneous standards demand different housing typologies. Thus the heterogeneity of the current society with different income levels, multi-faceted family, diversified types of professional occupation, gender, levels of differentiated studies, demographic structure changing, and endogenous changes in the family structure significantly change typology and morphology proposals for the low-income housing that will be proposed.

With relation to City (2), the authors question the relationship of the housing unit with the urban space, observing that housing must be inserted in the city and not being its continuity. In this sense, the values of proximity; the relationship of housing with public space; living spaces; as well as intermediate spaces, assume, perhaps, greater importance than the housing unit. Proximity values are strengthened, where the dwellers must carry out maximum activities on foot, using alternative paths, where they may have several options, easy access to public transportation, daily basis purchase, education, work, health, sports, leisure and equipment of the neighborhood. The authors say that the residence must be understood as the “urban project”, that is, the residential project must be seen as part of a balanced urban project. The housing units cannot be autonomous parts. When they are functional they must enable the community and social network strengthening creating the real city based on a good urban project (Montaner et al. 2011: 45).

With relation to Technology (3), the authors approach systematization, technological adaptation of the housing unit installations. They suggest putting humid areas into a

group; construction quality and adaptation, which must, necessarily, house technological innovations, including the residence in an even more mutant reality. Within this reality, it is necessary to think about new devices that offer alternatives to conventional strategies for one type of family. Design answers must be able to adapt to various factors such as flexibility, one of the important conditions to the housing space, keeping an adequate articulation with the systems, structures and construction elements. These elements, as well as the building closure and installation must be taking into account in order to allow greater evolution and adaptation to the users' changes. (Montaner et al. 2011: 51-54).

The tightness of the project and building must not become obstacles to the changes and adaptation of the residence to the specificities of each family, in a society that has been changing. They contain technical devices that make the building growth feasible, making the internal spaces modifications and installations and update possible. This desired construction adaptability and flexibility might be obtained through the use of structures like large lights, façades with equidistant repetition from emptiness, availability of light partitioning, mobile elements which may be easily fixed or changed into installations.

Approaching the issue Resources (4), the authors propose the resumption of project parties, a little vernacular, but forgotten because of the use of new technologies, electricity, air conditioning, elevators, not remembering the passive and active use of the urban weather, cross ventilation, energetic efficiency, waste and material recycling, dos inputs and energy. They emphasize that studies for the building implementation, taking into account better use of natural light must be reused, as well as the exploration of façades and coverages suitability. Façades must be accepted not as closures, but as thermal capacity elements and solar energy collection. Glazed areas together with the bioclimatic quality of housing and its sealing provide adaptation to the surrounding area, through semi-permeable versatile membranes, translucent and transpiring filters. Then, plural façades must be based on the project premise, where they would be different because of their direction, searching for natural light and ventilation, installation of photovoltaic cells, use of water heating, heating system, gray water and waste management.

2. RESULTS OF THE STUDY CASE ANALYSIS

2.1 Analysis with relation to the Society issue

District Santa Marta, where Vila Donária is located in, is characterized by a low-income population. It arose near the power transformer station implemented for four decades and along with the access road to the rural district. Having precarious housing in the beginning of its construction, it was denominated village Brasília; after that, low pattern housing arose, that is, self-constructed housing. The neighborhood counted on reduced community equipment: a school, a church and a social assistance institution. Besides popular lots, in the decade of 2010, it started to receive centers of social housing, contributing to the assistance of low-income families that came from other areas of the city. Other private businesses carried out in program Minha Casa Minha Vida offered apartment buildings and also isolated houses, bringing a population whose socioeconomic status is higher than the one herein studied, contemplating the economy heterogeneity and diversifying the landscape built. In the same program MCMV there was the construction of dispersed units of individual owners. Today, the neighborhood counts on a scattered population in uni-

familiar housing, which are far from the job market, socialization and neighborhood relationship. The community has little access to public transportation and equipment.

The Project plans the construction of about 17 small housing condominiums, where 13 are already built and inhabited. Three condominium typologies were planned for two socioeconomic groups of population and in accordance with the financing possibilities of the Program. The twin houses typology is addressed to a low income population, whose Family income is from 0 to 3 minimum wages, fitted in group 1 of financing (Fig. 2).



PMCMV - Group1	Closed condominiums	Units	Area of the units
Family income of up to U\$ 400. Register of the families by the Housing Secretary. Typology of twin houses. Sales value U\$ 13.000. Subsidised. Installments up to 10% of their wage.	Bosque das Cerejas; das Pitangas; das Uvaías; das Guabirobas; das Uvaías; dos Araçás; dos Butiás; dos Guabijus.	24 per cond.	42.00 to 50.45 m ² , 2 bed, living room, kitchen and bathroom
Total	8 condominiums	192	

Figure . Condominiums Jardins Nativos Group 1- twin houses.

The typology of isolated houses is addressed to a population whose Family income is from 3 to 5 minimum wages, fitted in group 2 of financing (Fig. 3). The same way, the typologies of apartments in small buildings of two floors are addressed to group 2 (Fig. 4).




PMCMV – Faixa 2	Closed condominiums	Units	Area of the units
Family income from 3 to 6 minimum wage (U\$ 610 to 1.200 in 2016); Sales in the market; Typology isolated ground house. Subside U\$ 425	Jardim Camélia, Jasmim, Hortênsia, Romã, Azaleia	23 per condominium	50.45 m ² 2 bed, living room, kitchen and bathroom
Total	5 condominiums	115 units	

Figure . Condominiums Jardins Nativos Group 2 – isolated houses.

The Project being analyzed, when mixing condominiums of various income groups, provides a mixture of social groups. It brings in close community relationship when implementing condominiums of different typologies in close neighborhoods. It suggests the strengthening of social networks when mixing differentiated neighborhoods and more

qualified intermediate spaces, thus one of the aspects that differentiates this project from others is the adoption of condominiums with a limited number of housing units.



MCMV – Group 2	Closed condominiums	Units	Area of the units
Family income up to U\$ 400; Sale in the market; Typology apartments; 4 per floor 16 per 2-story-buildings; Sales value U\$ 28.000 Installment from U\$ 100 to 120	Residencial Ipê Residencial Araucária	100 per condominium Condominium area: penthouse, parking, playground	52,80 m ² private area; 112,00 global area; 2 dorms, living room, kitchen and bathroom, balcony
Total	2 condominiums	200 units	

Figure . Condominiums Jardins Nativos Group 2 – apartments, parking, leisure and accessible ground houses.

2.2 Analysis with relation to issue City

With relation to the issue City, the neighborhood has been integrated to the urban fabric by means of the urban Project of qualification and population occupation, which prioritizes the inclusion of social housing projects. However, its location between two high flow state highways that form the beltway, which surrounds the most part of the formal city, generates salient limits, which make social and physical integration difficult in the new neighborhood. The new housing, even containing mono-functional characteristics, has been generating implementation and qualification of community equipment, providing more access to education (ongoing implementation of new elementary and fundamental schools) and health (health unit in work). The perspective of new dwellers, whose income is a little higher, must bring new businesses and services.

The road network paving has been accomplished through projects that are financed by the government and it evolves by following the housing construction process. This will make the dwellers' moving for their daily activities and access to public transportation easier. Paved routes provide more accessibility and access to public transportation. But despite these characteristics, it is observed that the business is still distant from a urban center. This way, this center presents different aspects with relation to other projects carried out in the country, and it can suggest a diversification of the urban morphology and social mixture. It deserves a follow up of the consolidation process of the neighborhood to verify the territory occupation. But these characteristics qualify the proposal.

2.3 Analysis with relation to Technology and Resources

Since it is a Project that meets the requirements of the financing program MCMV, the typologies follow with spaces planned by public notice, that is, maximum 300 units per condominium, ground houses with a minimum of 32 m², apartments with 37 m². The same

way, it is a rigid program, units with two dorms, living room, kitchen, bathroom and laundry room, where they are larger in the apartments than in the isolated or twin houses.

The apartments present a private area of 58 m², but they are distributed in small two-story-buildings, forming closed condominiums with penthouses and barbecue and playground. The internal areas are paved with public lighting, green areas with parking and access to pedestrians and vehicles through electronic gates. The construction technology in precast concrete in great forms and coverage in prefabricated slabs does not plan the possibility of enlarging the area or doing internal modification.

The rationality of the work begins by the foundation radier, with reinforced concrete with steel fiber, plastered installations and removal of walls, making construction easy. Plumbing installations with pre-cut kits installed in negative in the concrete masonry blocks, ceiling plaster and prefabricated slabs, besides other items. The finishing with textured mass and painting, ceramic tile floor, tiles on roughcast on wet areas, provide good quality to housing. External aluminum frames with shutter and granite sill provide ventilation and natural lighting to the environments, reducing energy waste.

2.4 Urban integration and leisure

The Project and construction of the district comprised of social interest housing of varied typology has been implanted yet. But the immediate occupation of housing units already accomplished allows to evaluate a proposal for their approval.

The housing built with technologies which are adapted led the population to a qualified housing, which was showed by the users' satisfaction that can be seen in the care of the condominium areas and housing maintenance. The community experience evidenced by the significant increase of school enrollments and participation in social activities demonstrate the objective indicators of the successful undertaking.

3. CONCLUSION

With relation to the Society issue, the use of typologies and income groups differentiated in one same urban area, allows the diversity of residential occupation. The new social contemporaneous patterns demand different housing typologies. But the inflexibility of the ambient, that is, units with two dorms suggested by the financing body, damages the assistance to the heterogeneity of the current society, whose composition is a multi-faceted family. Also, they ignore the issue of new forms of work that could use extra spaces in the residences for income generation. With relation to urban morphology analyzed in the City issue, it is verified that the studied shows a relative diversity with ground housing or buildings with few floors, it results in a horizontal landscape. This way, it incorporates, fills the existent landscape of housing and ground and spread equipment.

The typology adopted of centers in the form of closed condominiums with a number of 24 uni-familiar units or 100 multi-familiar units, although it segments the urban space, it seems to result in better building and common areas maintenance. The limits imposed by the neighborhood and the need for respecting the condominium norms creates more defined responsibilities with relation to infrastructure. As a singularity of the proposal, besides the infrastructure more complete in open lawn areas, permeable areas and public

internal lighting, each condominium have spaces for parking, a new reality that happened because of the Brazilian economic moment when it is possible to opt for having their own vehicle instead of using public transportation. Common areas with closed and opened spaces for leisure are a differential.

With relation to the singularities of the proposal towards issues Technology and Resources, the construction system streamlined arises as innovation, thus it reduces waste, accelerates the construction term and results in housing units with better construction quality. It uses openings with sealing in the dorms, solar direction, allowing natural ventilation and lighting and materials with isolation. The units for low income families, when owning solar heating devices for water, contribute to the reduction of energy waste.

It is emphasized that, although it is delivered to the private initiative, the construction of the new low-income housing had the public power's commitment in carrying out pavement on the lanes, building schools and a future leisure area. This demonstrates that the fact of being an area planned in the municipal urban legislation of the new neighborhoods, it turned it easy and aggregated value to the urban space, that obtains paved sidewalks, accessibility, despite little urban forestation and no green area. Therefore, the neighborhood lacks business establishments of commercial supply and services, thus it does not have spaces in the neighborhood. Social spaces for the youngest is another great lack. Concluding, issue inhabit for the present is the creation of new landscapes and the great majority of the Brazilian cities demand a participative construction. Combining private interests with in the use of the real state financing capital, meeting the demand of social housing, even being contradictory, it may be feasible. But it demands guidelines that consider that the balanced urban Project is the private entrepreneur as well as the public power's responsibility. Yet, it should count on a more effective participation by the dwellers when establishing priorities for urban integration and inclusion.

REFERENCES

- Bonduki, N.; Ghilardi, F. H. 2012. *Política e Sistema Nacional de Habitação, Plano Nacional de Habitação*. Rio de Janeiro: IBAM Municipal: Agência Goiana de Habitação. In: <http://www.agehab.go.gov.br/pehis/download/texto%201.pdf>. Accessed may 2012.
- Brasil. Ministério das Cidades. 2012. *Programas habitacionais*. Brasília.
- Const.Priori. *Jardins Nativos*. In: <http://www.construtorapriori.com.br/>. Accessed fev. 2016.
- Fee-Fundação de Economia e Estatística. 2012. *Passo Fundo*. Porto Alegre.
- IBGE - Instituto Brasileiro de Geografia e Estatística. 2010. *Censo demográfico: 2010*. Rio de Janeiro.
- Maricato, Ermínia. 2011. *Os impasses da política urbana no Brasil*. Petrópolis: Vozes.
- Meyer, João F. P. 2014. As políticas habitacionais e seus desdobramentos. In: Vargas, Heliana Comin; Araújo, Cristina Pereira de. (Orgs.) *Arquitetura e mercado imobiliário*. Barueri, SP: Manole.
- Montaner, Josep Maria; Muxi, Zaida; Falagán, David H. 2011. *Herramientas para habitar el presente: la vivienda del siglo XXI*. Barcelona: Master Laboratorio de la vivienda del siglo XXI.
- Shimbo, L. Z. 2012. *Habitação social de mercado: a confluência entre Estado, empresas construtoras e capital financeiro*. Belo Horizonte: C/Arte.
- Werna, E. *Pluralismo na habitação: parceria agentes públicos e não públicos*. SP: Annablume, 2001.
- Passo Fundo. 2006. *Plano Diretor de Desenvolvimento Integrado*. Passo Fundo. In: <http://www.leismunicipais.com.br>. Accessed fev. 2016.