Ampliaciones en viviendas sociales – Estudio de caso en Ivoti – Brasil

Social Housing Enlargement – Case of Study: Ivoti – Brazil

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PAG 237 - 250

Resumen

Las viviendas sociales construidas en Brasil son modificadas con frecuencia por los usuarios, por lo general poco después de la construcción, por razones tanto funcionales como económicas. Al parecer, los diseños estándar que ofrecen los programas de vivienda pública no se ajustan a las necesidades de los usuarios. A partir de estas evidencias, el presente trabajo tiene por objeto examinar una situación real y analizar los cambios realizados en viviendas sociales en la ciudad de Ivoti, ubicada en el sur de Brasil. El estudio de caso examinó 32 residencias ubicadas en tres barrios de la ciudad. Se encontró que un 97% de las propiedades examinadas se ampliaron poco después de la entrega de las unidades. Como resultado, se puede concluir que los proyectos proporcionados por las agencias gubernamentales no están en conformidad con las necesidades de los usuarios en la región.

Palabras Clave: Construcción, vivienda social, diseño, ampliación, Brasil

Abstract

Social housing built in Brazil is often modified by users, usually soon after construction is finished, for both functional and economic reasons. Apparently, standard designs that public housing programs offer do not meet the needs of users. From this evidence, this study aims to examine a real situation and analyze changes made to social housing in the city of Ivoti, on southern Brazil. The case study examined 32 residences located in three districts of the city. It was found that 97% of the examined properties were expanded after the units were delivered. As a result, it can be concluded that the projects provided by the government agencies are not in accordance with the requirements of users in this region.

Keywords: Building sector, social housing, design, enlargement, Brazil

1. Introduction

The interior spaces layout of social houses is a key factor. The total floor area of such houses is usually reduced and their quality directly affects the inhabitant's quality of life. From a detailed research on houses spacing production, the most adequate architectonic planning methods can be obtained in order to fulfill the operation requirements of social houses. Consequently, low-income population will be able to access high quality units (Cordeiro and Szücs, 2003; Folz, 2008).

According to Bonduki (1999), housing ownership is a basic right. Housing has always been a significant shelter and protection for the human being. Fernandes (2003) stated that housing plays three different roles: for social, environmental and economical functions. Housing must provide shelter for the families and this is one of the main drivers for their development. Abiko (1995) states that housing is the space inhabited before and after working hours, enabling people to carry out primary tasks, such as feeding, resting, socialization and bodily function activities. Therefore, housing is understood as the unit capable of meeting basic principles as occupancy, safety and health conditions.

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Brazilian municipalities do not have an active participation, as far as housing construction is concerned; although they are able to establish regulations and take solid measures on the subject. There is still a great financing dependency on the states and the Federation, because municipal head officers are not politically willing to spend a portion of their budgets in social housing construction (Fernandes, 2003; Souza, 2005).

The purpose of this study is to identify and to evaluate projects enlargements classified as “social housing” programs, by focusing on single-family housing units built in Ivoti City, southern Brazil region. The main enlargement interventions will be assessed.

2. Social housing in Brazil

The current social housing design regulations have not considered the changes undergone by the Brazilian society, as the role of woman in the family, her access into the labor force, effects in the family; new ways of domestic leisure activities; change of social exchange patterns; educational background of children and young people; diverse family structures and other factors leading to new requirements on housings spatial layout (Leite, 2006).

In accordance with Leite (2006), it is also observed that housing offer is increasingly restricted and prices are progressively more expensive for low social classes, which monthly income rate is lower than three Brazilian minimum wages (around US\$ 900), and for middle class too. Interior spaces do not offer ergonomic comfort for adequate circulation among appliances, furniture and family socialization. The lack of privacy and current overcrowding forces inhabitants to go outdoors. Before moving into their new houses, most users have already planned the enlargements to be carried out in order to increase their houses areas. “Puxadinhos” (term used in Brazil to refer to poor quality enlargements) are built in order to precariously fulfill space requirements.

2.1 Social Housing Design

There are several characteristics considered as essential for housing design, such as housing habitability, comfort and quality conditions. The possibility of modifying and customizing the unit before concluding construction is a stage already in progress. In this context, the development of evolutionary housing projects could become a solution to meet the requirements of such housing inhabitants (Larcher, 2005).

Consequently, the housing enlargement adjustment study is gaining importance, as modifications shall be taken into consideration in this process. There are several researches about enlargements or interventions (Cordero and Szücs, 2003; Larcher, 2005; Marroquim and Barbirato, 2007; Moro, 2011; Szücs, 1998).

Housing design must consider the requirements from inhabitants. Malard et al. (2006) understood spacing as the facilitator of social networking, which has an active role in suggesting, enabling, obstructing or even conditioning events. Authors indicated that designing a neighborhood community is only possible by recognizing the spaces inhabitants are identified with.

According to Leite (2005), users long to live comfortably, so they start modifying their new houses as soon as they are delivered. The need to adjust houses is quite relevant. The original houses designs offered by housing plans undergo several changes, in terms of size, interior spaces layout and styles. Users are able to customize their homes by introducing modifications, which are often the construction of new rooms and changing indoor and outdoor characteristics.

2.2 Housing in Brazil - Recent housing policies

The impact of housing issue goes far beyond the unit construction. The solution is linked to several factors, such as the structure of low income social classes, their access to financing provided by government programs and deficiencies of the application of housing policies (Brandão, 1984; Maricato, 1987).

Brazilian government proposes to considerably reduce the deficit of housing sector, by increasing social housing. In quantitative terms, studies carried out by the Fundação João Pinheiro indicate that housing deficit in Brazil reaches almost 10% (FJP, 2006) mainly affecting low income population (Caixa, 2008).

Several existing housing programs, as well as the implementation of Cities Ministry, in 2003; the revitalization of housing policy by means of the PlanHab Program in 2008; prove there is a concern in maintaining researches and investments in social housing (Brazil, 2010).

Social Housing Subsidies Program (PSH) was created in 2001 to assist families earning up to three minimum wages (close to US\$ 900). Funds come from the Federal Savings Bank (Caixa Economica Federal). This is a collaborative program developed together with federal governments (responsible of selecting families and additional costs per unit). The enlargement shall not exceed the maximum area allowed by official entities for social housing, which is fixed in 70m² (Brazil, 2010).

Another current state subsidy is the Housing Rental Program (PAR), launched in 2004, which purpose is to assist people earning up to six minimum wages. Tenants pay a monthly amount equivalent to the rent during 15 years; afterwards they have the chance to purchase the property (Brazil, 2004; Caixa Economica Federal, 2008).

The Housing Development Program employs resources from the Fund of Warranty for Time in Service (FGTS), to improve urban, housing and social work infrastructure.

It objective is to facilitate the access to an adequate house unit for people in vulnerable situation, which monthly income per family reaches up to 500 dollars. The program transfers funds to federal states, municipalities and, direct and non-direct governmental entities. Funds are used in the following ways: improvement of neighborhoods, housing construction and housing rehabilitation (Brazil, 2010).

In 2005 the National Social Housing System (SNHIS) was implemented, in order to promote the housing access for low-income population. The Cities Ministry has become the central organization for this system, managing the resources for the National Fund for Social Housing (FNHIS); the Worker Assistance Fund (FAT); the Fund of Warranty for Time in Service (FGTS); Caixa Economica Federal (Caixa); and other potential programs or funds (Brazil, 2010).

The program My Home, My Life (MCMV) was created in March 2009, by the government of Mr. Luis Inacio Lula da Silva, with the purpose of constructing one million housing units by the end of 2022, with an estimated investment close to R\$ 34 billion (around 17 billion dollars, updated amount). The objective of this program is to finance real state (lands and buildings) for people earning up to three minimum wages and also for people earning between 3 and 10 minimum wages (from 900 to 3,000 dollars, app.) in Brazil.

Housing unit or apartment is payable at 30 years, by settling 100% of financed amount. The monthly installment shall not exceed the 20% of family income. If the family has a monthly income lower than three minimal wages, they are likely to receive a Federal Government subsidy ranging from R\$ 2,000 up to R\$ 17,000 approximately 1,050 to 8,600 dollars) as inverse function to the family incomes (Brazil, 2010).

3. Metodology

3.1 Characterization Study

This research is based on a case of study. The research combines architecture project analysis (by conducting interviews with technical supervisors and obtaining data from municipality records) and the analysis of actual situation after construction (by means of building inspection, inhabitants surveys and images analysis from Google).

By implementing the above analyses, public housing units were inspected in the city of Ivoti, focusing in the population earning from 0 to 3 minimum wages (income up to \$ 900 dollars). 32 buildings financed by two governmental housing programs (MCMV and PSH) were analyzed. The studied housing units are located in the following neighborhoods: Bom Pastor, Jardim Bühler and Morada do Sol.

3.2 Case of Study

Ivoti City is located at the east side of Rio Grande do Sul, at a distance of 55 kilometers from Porto Alegre, state capital in southern Brazil.

The main activities are leather and shoes industries, as well as food, vegetable and fruit products, flower farmers and dairy products. The present population reaches 20,000 inhabitants app.

The urbanization has rapidly increased from the 70s due to the industrial development. The first leather workshops were established at the backyards of German immigrants, which then became tanneries and shoe factories. Exporting activities increased and more labor hand was required. During such period Ivoti City received immigrants from various southern municipalities, who settled in the urban zone. German immigrant descendants continued living in Ivoti downtown, while new neighborhoods received the new inhabitants. Among new neighborhoods we find: Morada do Sol, Jardim Bühler and Bom Pastor. Today they are more populated than Ivoti City.

Figura 1. Visada parcial de Ivoti - barrios Bom Pastor, Morada do Sol y Jardín Bühler

Fuente: Google Maps (agosto de 2012)

Figures 1. Partial view of Ivoti City - Bom Pastor, Morada do Sol and Jardim Bühler Neighborhoods.

Source: Google Maps (August, 2012)

4. Presentation of results

4.1 Housing units in Bom Pastor Neighborhood

Bom Pastor Neighborhood, in accordance with Ivoti Municipality (IM), has 260 housing units approximately. Diverse enlargements have been attached to such housing units, thus practically modifying the total original design. The IM reports that the inhabitants of this neighborhood correspond to low-income people, earning less than two minimum wages (close to US\$ 600). Some inhabitants work under contract, but most of them are free-lancers.

In the IM there is a standard project developed by the planning department, providing 36.24 m² (Figure 2). However, the analysis of such buildings is not considered by this research. Construction works were financed by the Social Housing Program (PSH) and enlargements were executed by the own inhabitants.

Figura 2. Project Standard. Fuente: AI

Figure 2. Project Standard. Source: IM

Figure 3 shows the block layout of a housing unit neighborhood. Figure 3(a) shows compiled records available at the municipality (Block 52 surface areas provided by the planning department at IM). At the center (b) shows a picture obtained from Google Maps. Figure 3(c) shows the survey including the layout of housing units existing in this location.

Figura 3. Barrio Bom Pastor - Bloque 512: (a) los elementos del catastro, (b) imagen aérea, (c) esbozo de la encuesta
Fuentes: AI (a); Google Maps (b) Encuesta de los autores (c).

Figure 3. Bom Pastor Neighborhood, Block 512: (a) records elements; (b) aerial picture; (c) survey layout
Sources: (a) IM; (b) Google Maps; (c) Survey developed by Authors

In this case, interior spaces modifications were not identified because there were not designers involved at all. The total enlargement floor areas were measured and compared to the original design (municipal pattern, Figure 3a, versus actual built areas, Figure 3c). We can observe that almost all buildings were enlarged; in some cases the pieces of land have more than one housing unit (Table 1).

Tabla 1. Barrio Bom Pastor - Caracterización de los edificios en el Bloque 512

Table 1. Bom Pastor Neighborhood – Characterization of buildings, Block 512

Lote/ Plot	Área del lote (m ²)/ Plot area (m ²)	Catastro municipal (m ²)/ Municipal record (m ²)	Levantamiento realizado (m ²)/ Actual survey (m ²)
1	220.00	Dos viviendas de 49,00 m ² cada./ Two housing units, 49m ² each.	Una vivienda de 70,00 m ² . / One housing unit, 70.00 m ² .
2	200.00	Local sin edificación/ Non-constructed plot.	Una vivienda de 50,05 m ² (construcción irregular)/ One housing unit, 50.05 m ² (irregular construction type)
3	200.00	Una vivienda de 60,00 m ² . / One housing unit, 60 m ² .	Dos viviendas, una de 74,00 m ² e otra de 20,16 m ² . / Two housing units, 74.00 m ² and 20.16 m ² .
4	200.00	Dos viviendas, una de 49,00 m ² y otra de 51,00 m ² . / Two housing units, 49m ² and 51m ² .	Dos viviendas, una de 50,92 m ² e otra de 71,98 m ² . / Two housing units, 50.92 m ² and 71.98 m ² .
5	200.00	Dos viviendas de 49,00 m ² cada./ Two housing units, 49m ² each.	Dos viviendas, una de 81,60 m ² e otra de 18,80 m ² . / Two housing units, 81.60 m ² and 18.80 m ² .
6	200.00	Dos viviendas de 49,00 m ² cada./ Two housing units, 49m ² each.	Una vivienda de 81,60 m ² . / One housing unit, 81.60 m ² .
7	220.00	Dos viviendas de 49,00 m ² cada./ Two housing units, 49m ² each.	Una vivienda de 69,70 m ² . / One housing unit, 69.70 m ² .
8	324.00	Dos viviendas, una de 26,25 m ² e otra de 22,75 m ² . / Two housing units, 26.25 m ² and 22.75 m ² .	Una vivienda de 41,25 m ² . / One housing unit, 41.25 m ² .
9	306.00	Una vivienda de 69,30 m ² . / One housing unit, 9.30 m ² .	Una vivienda de 78,88 m ² . / One housing unit, 78.88 m ² .
10	306.00	Dos viviendas, una de 26,25 m ² e otra de 22,75 m ² . / Two housing units, 26.25 m ² and 2.75 m ² .	Una vivienda de 65,00 m ² . / One housing unit, 65m ² .
11	324.00	Dos viviendas, una de 26,25 m ² e otra de 22,75 m ² . / Two housing unit, 26.25 m ² and 22.75 m ² ..	Una vivienda de 83,00m ² . / One housing unit, 83m ² .
12	220.00	Una vivienda de 49,00 m ² . / One housing unit, 49 m ² .	Una vivienda de 76,50 m ² . / One housing unit, 76.50 m ² .
13	200.00	Una vivienda de 49,00 m ² . / One housing unit, 49 m ² .	Una vivienda de 134,06 m ² . / One housing unit, 134.06 m ² .
14	200.00	Una vivienda de 49,00 m ² . / One housing unit, 49 m ² .	Una vivienda de 153,00 m ² . / One housing unit, 153.00 m ² .
15	200.00	Una vivienda de 49,00 m ² . / One housing unit, 49 m ² .	Dos viviendas, una de 88,00 m ² e otra de 6,12 m ² . / Two housing units, 88 m ² and 6.12 m ² .
16	200.00	Una vivienda de 49,00 m ² . / One housing unit, 49 m ² .	Una vivienda de 75,00 m ² . / One housing unit, 75 m ² .
17	200.00	Una vivienda de 62,17 m ² . / One housing unit, 62.17 m ² .	Una vivienda de 62,17 m ² . / One housing unit, 62.17 m ² .
18	220.00	Una vivienda de 60,00 m ² . / One housing unit 60 m ² .	Una vivienda de 80,00 m ² . / One housing unit, 80 m ² .
19	324.00	Una vivienda de 26,25 m ² . / One housing unit 26.25 m ² .	Dos viviendas de 34,80 m ² . / Two housing units, 34.80 m ² .
20	306.00	Dos viviendas, Una de 26,25 y otra de 22,75 m ² . / Two housing units, 26.25 and 22.75 m ² .	Una vivienda de 54,00 m ² . / One housing unit, 54 m ² .
21	306.00	Una vivienda de 26,25 m ² . / One housing unit 26.25 m ² .	Dos viviendas, Una de 41,60 m ² e otra de 33,00 m ² . / Two housing units, 41.60 m ² and 33.00 m ² .
22	324.00	Una vivienda de 26,25 m ² . / One housing unit 26.25 m ² .	Una vivienda de 110,22 m ² . / One housing unit, 110.22 m ² .

4.2 Morada do Sol and Jardim Bühler Neighborhoods

The Morada do Sol and Jardim Bühler neighborhoods are located in the Ivoti City suburbs. The estimated population of these neighborhoods is approximately between 30% and 40% of the total city population. According to Ivoti Management Plan, such neighborhoods are located in a mixed and commercial area, respectively (Ivoti, 2006a).

The surveyed homes have similar areas in such locations; most of them financed by the My Home, My Life Program (MCMV) by means of the Caixa Econômica Federal; owners also received funds from the Fund of Warranty for Time in Service program (FGTS) as their own contribution.

The situation analysis indicates that the actual inhabitants profile does not correspond to low-income people because, in all cases, the rent of only one inhabitant was considered to apply for funds exactly because the total family income exceeds the limit established in three minimum wages (900 dollars). There are 26 inhabitants occupying ten studied housing units (2.6 inhabitants per unit). From 26 inhabitants, there are 7 children and 21 adults working under contract for leather-shoe industry and commercial sector. Once again, depending on the family size, there are evidences to believe they are lower-middle class families.

As examples obtained from developed studies, a project (Figure 4) is characterized. Enlargement carried out are shown in Figure 5. This is a project financed by My Home, My Life Program. Designers have reported that future owners had already planed the enlargements, from the very beginning of housing design process. Owners indicated they wanted to build a garage, a barbecue grill and service area; therefore, windows were not included at the building east side. A door was designed for the future garage, thus avoiding material waste and rooms with poor air circulation and lighting. The enlargement began two months after the construction works were completed.

Table 2 shows the main interventions carried out in such buildings.

Figura 4. Primera etapa de la obra. Fuente: Taller de arquitectura responsable por el proyecto
Figure 4. First stage of the construction work. Source: Architecture Office responsible for this Project

Figura 5. Segunda etapa de la obra. Fuente: Taller de arquitectura responsable por el proyecto
Figure 5. Second stage of the construction work. Source: Architecture Office responsible for this Project

Tabla 2. Barrios Morada do Sol e Jardín Bühler - caracterización de las viviendas originales y ampliaciones
Table 2. Morada do Sol and Jardín Bühler Neighborhoods - characterization of original housing design and enlargements

Proyecto original/ Original Project				Ampliaciones/ Enlargements		
Vivienda/ Housing Unit	Terreno/ Land	Área Inicial/ Initial Area	Número de cuartos/ Rooms Number	Espacio/ Room	Área Ampliada/ Enlarged Area	Área Actual/ Current Area
1	330,00 m ²	50,05 m ²	2	Garaje, área de servicio e balcón/ Garage, service area and balcony	25,80 m ²	75,85 m ²
2	326,04 m ²	52,09 m ²	2	Garaje, área de servicio, baño y cocina/ Garage, service area, bathroom and kitchen	42,48 m ²	94,57 m ²
3	311,88 m ²	33,06 m ²	1	Área de servicio/ Service area	3,00 m ²	36,06 m ²
4	360,00 m ²	35,83 m ²	1	Garaje/ Garage	10,25 m ²	46,08 m ²
5	330,00 m ²	43,80 m ²	2	Garaje y área de servicio/ Garage and service area	25,55 m ²	69,35 m ²
6	378,00 m ²	39,76 m ²	1	Garaje, área de servicio, baño, living y dos dormitorios/ Garage, service area, bathroom, living room and two bedrooms	108,10 m ²	147,86 m ²
7	326,04 m ²	49,00 m ²	2	Garaje, área de servicio y baño/ Garage, service area and bathroom.	49,00 m ²	98,00 m ²
8	360,00 m ²	36,00 m ²	1	Dos dormitorios y balcón/ Two bedrooms and balcony	33,62 m ²	69,62 m ²
9	405,00 m ²	42,36 m ²	2	Cocina e área de servicio/ Kitchen and service area	17,64 m ²	60,00 m ²
10	380,28 m ²	43,80 m ²	2	Garaje, área de servicio y baño / Garage, service area and bathroom.	43,80 m ²	87,60 m ²
Promedio	350,72 m ²	42,57 m ²			35,92 m ²	78,50 m ²

5. Discussion and analysis of results

5.1 Initial results

The interviewed population has a job and fixed monthly income. They are favored by programs such as My Home, My Life and Social Housing Subsidies (PSH). However, it is often found out that these families report the salary of only one person, mainly when they are *de facto* unions, not legally recognized.

Most interventions were made within the first three years of occupancy. In some cases, the interventions were likely to take place before occupancy. Morada do Sol and Jardim Bühler housing programs were assisted by designers previously to construction stage; therefore, the enlargement was programmed during the design process. However, Bom Pastor housing units are excluded from such process, because there is only one standard design for these buildings, which is reproduced under a serial design delivered by Ivoti Municipality (Figure 4). Construction is jointly executed including the participation of future residents. Field research indicated that currently housing units do not follow the original design. Actual situations reveal two types of very different occupancies. In spite of the physical proximity between both locations (Figure 1), Bom Pastor Neighborhood has a poorer population, while Morada do Sol and Jardim Bühler Neighborhoods have a higher social economic class population.

5.2. Analysis of housing units in Bom Pastor Neighborhood

The analysis of housing units in Bom Pastor Neighborhood, carried out by means of photographic survey comparisons, proves that from 22 housing units only one has not been modified. Granted loans have been reviewed, since there are several debts in this program. The minimum installment amount is R\$ 120 (approximately US\$ 62); however, most users are unable to pay back. The lack of interest by the federal government is also evidenced, since previous surveys were not carried out to find out if the location chosen for building the house was appropriate or not. In most of the cases, the technical staff from IM is responsible of changing the location.

5.3. Analysis of housing units in Morada do Sol and Jardim Bühler Neighborhoods

By means of buildings analysis developed in surveyed neighborhoods, Morada do Sol and Bühler Garden, we may outline some relevant aspects. Table 3 shows a summary of interventions made on housing units in accordance with users' needs. According to Table 3, it can be understood why an intervention is made. At least in 80% of buildings, the reason corresponds to the size, lack of space, circulation problems. Only 40% of owners requested the assistance of a qualified professional to develop the enlargement, thus provoking lightning, air circulation and esthetic problems.

Tabla 3. Barrios Morada do Sol y Jardín Bühler - principales cambios
Table 3. Morada do Sol and Jardín Bühler Neighbourhoods – main interventions

Modificación/ Intervention	Cantidad (respuesta múltiple)/ Quantity (multiple answers)	Motivo apuntado/ Argued reason
Ampliación de ambiente/ Room enlargement	10	Tamaño y necesidad/ Size - necessity
Construcción de muro/ Wall construction	8	Seguridad y desnivel do terreno/ Safety - inclined land
Construcción de área de servicio/ Service area construction	8	Tamaño/ Size
Construcción de garaje/ Garage construction	7	Necesidad/ Necessity
Ejecución de calzada/ Roadway improvement	6	Acabamiento/ Finishing
Construcción de baño/ Bathroom construction	4	Tamaño y necesidad/ Size - necessity
Cambio de función de algún ambiente/ Modification of a room functionality	4	Tamaño y necesidad/ Size – necessity
Aumento o dislocamiento de la cocina/ Enlargement or re-allocation of kitchen	4	Tamaño/ Size
Ampliación de dormitorio/ Bedroom enlargement	2	Tamaño y necesidad/ Size – necessity
Construcción de balcón/ Balcony construction	2	Necesidad/ Necessity

An intervention example, to be executed before inhabiting the housing unit, is the construction of the service area. The total housing units under study have a covering tank fulfilling housing programs requirements. However, the coverage is generally lower than 0.80m, thus limiting room usage taking into account that weather conditions are cold and humid in that region. From Tables 2 and 3, we can observe that service areas were constructed in 80% of housing units.

The bathroom shows the lowest intervention rate, because it is the most expensive room in the building. Its intervention cost implies including sanitary installations and finished products, either for the original layout or original size. It was observed that bathrooms have not been modified in the surveyed buildings; however, a 40% of interventions correspond to a new bathroom.

The analysis of garages interventions is quite surprising, mainly in regards to the housing unit size. 70% of them correspond to garage enlargements. The housing unit 4 is taken as example; the owners built the garage using irregular methods, before inhabiting the house. Other examples are housing unit 7 and 10. Since the land is subject to a tax withholding benefit, the rooms were designed fitting this scheme. After the fiscal control inspection is made, an “occupancy license” is approved and then unit is registered under a notarized certified instrument. Now the owners modify the house characteristics, by including vehicles access doors, by building bathrooms and service areas.

Tabla 4. Barrios Morada do Sol y Jardín Bühler - cambios en dormitorios
Table 4. Morada do Sol and Jardín Bühler Neighborhoods – bedroom interventions

Vivienda/ Housing unit	1° Dormitorio (m²)/ 1st Bedroom (m²)	2° Dormitorio (m²)/ 2nd Bedroom (m²)	Área en dormitorios (m²)/ Bedroom areas (m²)	Ampliación/ Enlargements
1	9.00	7.50	16.50	No
2	9.35	7.80	17.15	No
3	9.00	-	9.00	No
4	11.39	-	11.39	No
5	9.00	6.00	15.00	No
6	13.32	-	13.32	Si
7	9.32	7.59	16.91	No
8	12.21	-	12.21	Si
9	9.00	6.00	15.00	No
10	9.00	6.00	15.00	No

From the analysis of data presented by Table 3, we can observe that housing units having only one bedroom correspond to a 40% of surveyed buildings. The owners of a single-room housing units were single people or just married couples when the house was delivered. Such units were designed considering a potential enlargement or attachment construction, for example a second housing unit to be constructed in the same plot.

Two-rooms housing units correspond to the 60% of surveyed buildings. The inhabitants profile corresponds to a couple with one or more children (80%). Some bedrooms in such houses are classified as “stores”, because in accordance with construction regulations of Ivoti City (Ivoti, 2006b) the main bedroom shall have 9m² and others at least 7.5 m². For this reason, a room is classified as “deposit” in the project to be approved by the competent authority in Ivoti Municipality; however, it is actually constructed to be used as a second bedroom.

Tabla 5. Barrios Morada do Sol y Jardín Bühler - cambios en las cocinas y salas de estar
Table 5. Morada do Sol and Jardín Bühler Neighborhoods – interventions in kitchens and living rooms

Vivienda/ Housing Unit	Integrado/ Built-in	Individual	Área de la cocina (m²)/ Kitchen area (m²)	Área del living (m²)/ Living room area (m²)	Ampliación/ Enlargement
1	No	Si	9.44	9.31	No
2	No	Si	7.79	10.70	Si/ Yes
3	Si/ Yes	No	15,12		No
4	Si/ Yes	No	15,18		No
5	Si/ Yes	No	15,15		No
6	Si/ Yes	No	17,02		Si/ Yes
7	Si/ Yes	No	17,67		No
8	Si/ Yes	No	15,72		Si/ Yes
9	Si/ Yes	No	16,37		Si/ Yes
10	Si	No	15,15		No

According to Table 5, it is concluded that the 80% of kitchens and living rooms are built in areas. However, only 30% of them were modified, without turning the room into a dining room, mainly because there was no space for kitchen furniture. This area is even similar to an individual bedroom, not reaching 20m².

6. Final observations and conclusions

The overall analysis of social housing units in Bom Pastor, Jardín Bühler and Morada do Sol Neighborhoods shows that, in spite of the fact that Ivoti population has actually few economical problems, there are several differences between them. However, the three neighborhoods have introduced modifications to their houses, being the enlargement of housing interior spaces the main reason to do so.

Relevant factors were achieved by identifying, describing and characterizing Ivoti's social housing programs. Projects contradict the requirements from users, since the house is modified even before it is delivered to owners.

Some cultural reasons shall be considered: users enlarge their garages ("male feature") in the same proportion service areas are enlarged ("female feature"). Owning a place to park the car is a regional characteristic, even in small houses. Other factor is that the car is regarded as a working tool, which is used for earning a living; therefore, its protection is justified.

The financing programs actually do not reach low-income population, since in most of the cases; owners report the income of only one inhabitant to apply for the housing benefit and to obtain governmental subsidies.

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8. Referencias/ References

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