CONSTRUCTION WASTE AND SELF-HELP AS AN ALTERNATIVE TO ENHANCE HOUSING AFFORDABILITY: A CASE STUDY OF A HOUSING PROJECT IMPLEMENTED IN IBIPORÃ, STATE OF PARANÁ, BRAZIL

By

LIDIANE APARECIDA VIANA BEHLAU

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To Mom and to the memory of my beloved dad

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LIST OF ABBREVIATIONS

BNH	National Housing Bank (*Banco Nacional de Habitação*)
CEF	Federal Savings Bank (*Caixa Econômica Federal*)
CODESI	Development Company of Ibiporã (*Companhia de Desenvolvimento de Ibiporã*).
COHAB	Housing Company (*Companhia de Habitação*)
CONAMA	Environment Council (*Conselho Nacional do Meio Ambiente*)
FGTS	Guarantee Fund for Time in Service (*Fundo de Garantia por Tempo de Serviço*)
HUD	United States Department of Housing and Urban Development
IAP	Paraná State Environmental Agency (*Instituto Ambiental do Paraná*)
IBGE	Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística)*
OSCIP	Civic Society Organization of Public Interest (*Organização da Sociedade Civil de Interesse Social*)
PEL	Correctional Institution of Londrina (*Penitenciária Estadual de Londrina*)
PSH	Social Housing Subsidy Program (*Programa de Subsídio à Habitação de Interesse Social*)
SAMAE	Autonomous Municipal Service of Water and Sewage (*Serviço Autônomo Municipal de Água e Esgoto*)
SEMA	Environment Agency (*Secretaria do Meio Ambiente*)
SFH	Housing Finance System (*Sistema Financeiro de Habitação*)
SINAPI	National System of Construction Cost Index (*Sistema Nacional de Custos e Indices da Construção Civil*)

Abstract of Thesis Presented to the Graduate School
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Lidiane Aparecida Viana Behlau

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For decades, the Brazilian government has tried to provide affordable housing to the needed families. The traditional way of attending the needs of citizens is through welfare policies. However, despite the fact that recent public housing programs have been planned to house low-income households, benefits have not reached the poor. In the 1980s, when Brazil was experiencing a deep unemployment crisis and high inflation rates, the banking agency responsible for financing housing in Brazil was struck by a financial turmoil and fell deeply into crisis. Since then, housing provision in Brazil has enabled the emergence of new actors and increased the participation of non-governmental organizations–NGOs, community associations, and private partners. Non-governmental organizations have performed a complementary role and assisting in improving the performance of public programs. This does not mean that governments will be replaced by non-public agents, but shifted from provider to supporter. Another tendency is the participation of households during the processes of planning and management of projects, and self-help. One aspect that hampers housing affordability and the household's ability to improve housing conditions is the high cost of

construction materials and lack of planning and design. The reuse of construction wastes represents an attempt to decrease both housing costs and environmental impacts posed by building wastes. By disassembling materials that would have been discarded in landfills, construction waste can be recovered and reused. Moreover, due to the recycling potential, building and demolition wastes can be reused in the construction of new houses at reduced costs, or new materials can be produced at a lower cost. The objective of analyzing the interface between recycling and housing affordability is to evaluate the possibility of reducing housing costs for low-income families through the use of construction wastes. Assuming minimum recycling costs, this study hypothesizes that the benefits of recycling and reuse of construction wastes in new housing construction could have significant downward pressure on housing costs and enhance affordability. By interviewing key project sponsors and assessing resident's perception through survey, this study finds that the featured housing project that used construction waste from deconstructed buildings should undergo quality control measures. Besides, success in managing self-help volunteers in housing projects can be accomplished through planning, multidisciplinary team work, and shared responsibilities, to ensure that the original goals are accomplished and that the commitments established are fulfilled. Also, unpaid labor contributed to boost affordability and self-help work is justified for providing a beneficial outcome for the worker, a home. Construction waste provided the means to lower the total building cost, but the cost-effectiveness between the quality of the materials and the final product remains a blurry relationship.

CHAPTER 1
INTRODUCTION

Overview of the Housing Situation in Brazil

Consequences of Urbanization

The housing deficit has been a major issue throughout many Brazilians cities, regardless of size, boundaries and population. The most affected segment of the population includes the unemployed, the low-wage earners, and the informal workers.[1] For decades, the government has tried to provide affordable housing to the needed families; however, as housing always involves a complex set of social, political and cultural initiatives, the battle towards the provision of decent accommodation for people in Brazil remains intense and far from getting to an end.

The worsening of the housing crisis in Brazil began in the 1950s as a consequence of the industrialization and urbanization processes (Sachs, 1999). During the economic boom launched by these processes, rural families moved to the cities seeking job opportunities and the comfort of amenities frequently offered by urban areas. The steady increase of the urban population (Table 1-1) led to a series of issues that negatively affected the daily lives of urban dwellers, such as lack of housing, sewage, drinkable water, infrastructure, access to public amenities and to the city as a whole. Moreover, the industrialization and urbanization processes has provoked dramatic changes in Brazil's socio-economic and territorial order, and impacting changes in the environment (Fernandes, 1997). Such an accelerated process of urban

[1] In developing countries, many workers do not rely on regulated working activities but on informal, self-employment work. Working arrangements are usually temporary, lack coverage by minimum wage laws, and allow ease entry and ease employment turnover. Informal working activities are untaxed but the economic importance of informal activities is correlated with the level of economic development. "In developing countries, the informal sector is a significant component of these economies, employing up to 60% of the workforce and producing nearly 40% of GDP" (Ihrig & Moe, 2004, p. 541).

growth has been largely uncontrolled. As a result, the modernized central areas of big cities are surrounded by poor peripheral, usually irregular land plotting originated from an uncontrolled progressive city growth characterized by slow building process and precarious constructions with wide living space as well stated by Ferguson & Navarrette (2003) and Turner (1967).

The socio-spatial provision of public services and the distribution of collective consumption facilities are extremely and unfairly unequal in these areas that lack vital services like drainage and sewerage systems, health care, education centers, leisure facilities, green spaces, and access to safe water (Pamuk & Cavallieri, 1998; UN-HABITAT, 2003). Moreover, UN-HABITAT (2003), warns that the risks involved with scarce and unreliable water sources normally lead to a multitude of health problems that significantly impact the livelihoods of slums dwellers.

Informal Housing

Roots of the problem

Irregular occupations enable low income families to access consolidated areas in large metropolitan areas in Latin America (Fernandes, 2002). The contrast of regular and irregular housing segregates services and infrastructure by socio demographic characteristics of the residents. That is, wealthy families have access to both decent housing and urban infrastructure whereas poor families house themselves in segregated suburban areas without infrastructure. This situation is to a large extent the result of inaccessibility to urban land. The insufficiency of pro-poor housing policies inevitably leads to an increase of urban land invasions and the inflation of peripheral areas. In urban cores, the land is scarce and extremely expensive, which makes urban land unaffordable for the poor. Having no other option and facing the necessity to settle

close to areas that encourage interpersonal relationships, families illegally occupy areas, build shelters that meet individual housing needs, and gradually improve housing conditions.

Role of the government

Critics claim that the government has an elitist posture, the legislation is inefficient, and housing projects available have not been able to supply the growing demand. Instead, the government has historically given priority to economic development over social matters and policies have focused on the problem itself rather than targeting the population needs (Fernandes, 2002). Governments are in charge of solving the housing deficit and providing security and access to health and education for urban dwellers. The traditional way of attending the needs of citizens is through welfare policies. As cities grew in a disorderly fashion, housing became an issue mainly among the poorest (Silva, 1989). The failure of public programs and the scarce government commitment to the poor has lead to an increase of the housing deficit within low-income households and consequently to a troublesome escalation of social inequality.

Increasing participation of non-governmental and private partners

As an attempt to ameliorate the situation, Agenda 21 calls for increasing partnerships between governments and non-governmental organizations–NGOs in developing programs in favor of human development and sustainable growth. Likewise, UN-HABITAT (2003) states that NGOs should perform a complementary role and assist in improving the performance of public programs. Additionally, government-NGO partnerships do not represent a threat to government legitimacy, on the contrary, the electorate will most likely approve good governance even if delivered by an NGO (Mercer, 2002).

Housing provision in Brazil has been represented by the increasing participation of NGOs, community associations, and private partners. In Brazil, the 1980's crisis enabled the emergence of new actors engaged in housing provision that combined public-private partnerships and less government interference (Kalil, 2004). Another tendency is the participation of households during the processes of planning and management of projects, and self-help. In self-help projects, households mutually engage in the construction work of houses and carry out workforce tasks (Kalil, 2004). Housing delivered through NGO and private initiative has become a successful way of reaching the poor. The reason of success are not clear, but "service delivery through markets and private initiatives is held to be more efficient than through the state" (UN-HABITAT, 2003, p. 156). Governmental–non-governmental partnerships have become the main provider of welfare policies to the poor (UN-HABITAT, 2003).

Housing Deficit and the "My House My Life' Program

In 2000, the housing deficit in Brazil was estimated at 7,222.645 households (Table 1-2). The overall housing shortage in the country decreased in 2007 to 6,272.645. However, such decrease was not experienced in all regions. In 2000, the Northeast region topped the ranking of housing deficits (2,851.197), closely followed by the Southeast (2,341.698). However, in 2007, the housing deficit in the Southeast slightly decreased to 2,335.415, but it remained the region with the greatest housing deficit. In 2000, the deficit in the North, South and Midwest regions reached 846,696; 678,879; and 502,175 housing units, respectively, whereas in 2007, except for the South, all these regions experienced a decrease in the housing shortage. At that time, there was an increase of the housing deficit in the South region (Table 1-2).

In 2000 and 2007, the housing deficit was higher among households that received less than three minimum wages (Table 1-3). In 2007, almost 90% of the housing demand was registered within households that received less than three minimum wages. In all regions, the shortage has increased among this income bracket between these years, whereas households with higher income had experienced a decrease in housing deficit. Although the overall housing deficit in Brazil decreased from 2000 to 2007, the housing deficit among low-income households increased.

The program 'My House, my Life' (*Minha Casa Minha Vida*), the most recent federal housing project launched by the government promised to give priority to low-income families (Brazil, Ministry of Cities 2011, a). However, the media has suggested that the program has provided houses to only a very low number of households that received less than three minimum wages. According to information published online on an influential Brazilian newspaper (*Folha de São Paulo*), an assessment of the performance of the refereed program by the Federal Savings Bank (CEF) showed that, until June 2010, of 240,569 signed contracts, only 565 had been fulfilled and delivered houses to families that received less than three minimum wages[2], which represents less than 2% (Figure 1-1). On the other hand, almost 60% of houses had been delivered to households that received up to six minimum wages and 10% to families with income of six to ten minimum wages (Michael & Lima, 2010).

Research Rationality

Scholars have observed that poor families in developing countries have the ability to progressively house themselves through self-help, patience, and agreements

[2] The Brazilian minimum wage in 2010 was R$510,00 Brazilian reais–BRL (equivalent to USD $305,00).

with friends, relatives, and neighbors. The investment of low-wage earners becomes more advantageous if their limited resources are invested continuously as their monthly income allows. While self-help contributes to decrease the cost of production, construction waste also provides the means to lower the total building cost. “Building materials account for 60–65% of the non-land cost of housing in general and have been found to account for 86% of the cost of self-help housing” (Gough, 1996, p. 635, citing Agarwall, 1987). Recycling construction wastes is an affordable alternative because new houses can be built at reduced costs, new materials can be produced at lower cost, and “the resale of valuable recovered materials can far offset the additional labor costs associated with building dismantling” (Kibert, 2003, p. 84).

This research aims at answering whether the recycling of construction wastes and self-help provide the means to downward pressure on housing costs and enhance housing affordability. Interviews with key project sponsors and survey to assess resident’s perception were carried out. Assuming minimum recycling costs, this study hypothesizes that the benefits of recycling and reuse of construction wastes in new housing construction could significantly decrease the cost of housing production.

Progression of the Study

The following chapters address the characteristics of affordable housing, exploring the ways in which housing provision by governments and NGOs have contributed to alleviate housing needs of the poor, while evaluating the use of recovered building material in the construction of new housing units. The literature review in Chapter 2 provides background information about housing context in Brazil, by exploring the way through which housing has been ruled and implemented within Brazilian cities. Also, it presents literature related to alternative ways to house low-income families, namely self-

help and use of recovered building materials, making the necessary connection between housing affordability and the alternative solutions.

Chapter 3 describes the methodology applied to conduct this study. Chapter 4 characterizes the NGO featured in this study and its contribution to improve housing affordability. Chapter 5 provides detailed information on the case study assessed associated with the methodology described in Chapter 3 and displays the results of the residents survey. Finally, Chapter 6 merges these findings into a critical analysis of the project outcomes, constraints, strengths and explores possible opportunities for further research and applications.

Table 1-1. Urbanization rates in Brazil, 1950 to 2000.

Year	% of urban population
1950	36.2
1960	44.7
1970	55.9
1980	67.6
1991	75.6
1996	78.4
2000	81.2

Source: IBGE 1997, 2000a & Sachs, 1999.

Table 1-2. Housing deficit in Brazil, 2000 and 2007.

Regions	2000	2007
North	846,696	652,684
Northeast	2,851,197	2,144,384
Southeast	2,341,698	2,335,415
South	678,879	703,167
Paraná	265,815	272,542
Midwest	502,175	436,995
Brazil	7,222,645	6,272,645

Source: Fundação João Pinheiro (FJP), 2005 and 2007.

Table 1-3. Housing deficit by family monthly income in minimum wage (mw) in Brazil, in 2000 and 2007.

Region	< 3 mw		3 to 5 mw		5 to 10 mw		> 10 mw	
	2000	2007	2000	2007	2000	2007	2000	2007
North	82.9	89.7	9.5	6.1	5.6	3.2	1.9	1.0
Northeast	91.3	95.9	5.5	2.7	2.3	1.0	0.9	0.4
Southeast	77.1	86.7	11.5	7.9	8.2	4.3	3.2	1.1
South	78.3	84.8	11.5	10.0	7.4	4.1	2.8	1.1
Paraná	82.3	86.8	9.7	8.9	5.6	2.9	2.4	1.4
Midwest	81.9	88.4	9.3	7.0	6.1	2.7	2.7	1.9
Brazil	82.5	89.4	9.4	6.5	5.8	3.1	2.3	1.0

Source: Fundação João Pinheiro (FJP), 2005 and 2007.

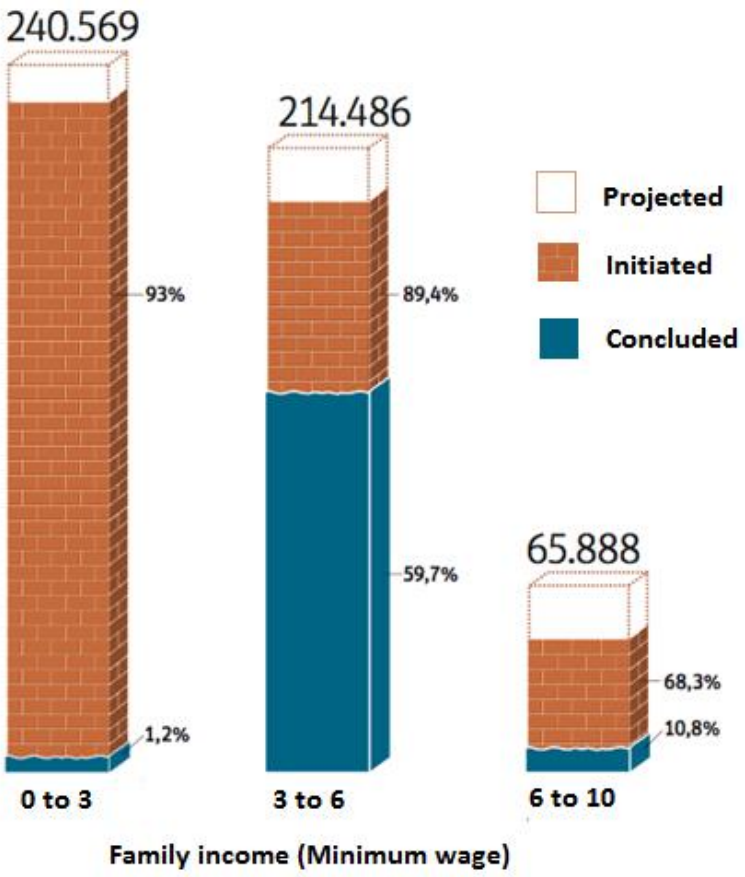

Figure 1-1. Number of houses projected, initiated and concluded by the 'My House, my Life' program until June 2010 by family income. [Adapted from Michel, A., & Lima, D. (2010, September 13). Caixa omite dados negativos sobre casas populares. *Folha de São Paulo*. Retrieved from http://www1.folha.uol.com.br/poder/782331-caixa-omite-dado-negativo-sobre-casas-populares.shtml.]

CHAPTER 2
REVIEW OF THE LITERATURE

Interface between Housing Affordability and Recycling

Developed and developing countries have been trying to create alternative ways to decrease environmental impacts posed by building wastes. Overall, “developing countries are in a sense better equipped to deal with deconstruction and material reuse compared with developed countries” (Kibert, 2003, p. 87). Apparently, this trend is the result of progressive policies on waste disposal management. At a global level, Agenda 21 for Construction in Developing Countries sets the framework for stimulating construction industries to carry out sustainable practices. At a national level, the National Environment Council–CONAMA (*Conselho Nacional do Meio Ambiente*) launched in 2002 the Resolution 307, which provides a framework to effectively decrease environmental impacts of the disposal of building wastes and sets criteria and rules for the construction industry to properly handle disposal wastes.

Building demolition is a procedure responsible for yielding huge amounts of waste (Kibert & Chini, 2000). Alternatively, deconstruction “calls for buildings to be dismantled or disassembled, and for the components to be reused or recycled” (Kibert, 2003, p. 84). By disassembling materials that would have been discarded in landfills, construction waste can be recovered and reused. Several countries have been upgrading design methods to allow buildings to be disassembled so the materials can be recycled and/or reused and implementing progressive policy to foster environmentally-friendly procedures such as deconstruction (Kibert, 2003). For instance, European countries have a tradition in recycling construction waste due to the lack of replacement material, and in countries such as The Netherlands and Germany,

the establishment of ambitious recycling goals (90% of recycling) confirm this trend. Several strategies have been used by many countries worldwide to handle deconstruction and recycling with positive results (Table 2-1).

Population growth and economic development, combined with poor techniques for handling waste disposal have helped to increase the amount of waste disposal daily produced in cities, exposing urban dwellers to a health hazard, whilst threatening the environment and exhausting landfills (Carneiro, 2001). Lack of policy to guide waste disposal management and/or lack of recycling programs usually results in construction and demolition waste being improperly discarded, landfilled or illegally dumped. As a result, poor households suffer with landslides, pollution and flooding. An alternative to demolition and a better approach to the problematic handling of construction waste is deconstruction (Kibert, 2003). Kibert (2003) has listed the advantages of deconstruction over demolition: (i) an "increased rate of diversion of demolition waste from landfills; (ii) potential reuse of building components; (iii) increased ease of materials recycling; (iv) enhanced environmental protection, both locally and globally" (p. 84).

Moreover, due to the recycling potential, construction and demolition waste can be reused in the construction of new houses at reduced costs, or new materials can be produced at a lower cost and hence improve housing affordability (Carneiro, 2001). Economically, deconstruction is advantageous over demolition as "the resale of valuable recovered materials can far offset the additional labor costs associated with building dismantling" (Kibert, 2003, p. 84). Likewise, Mauricio Costa, the founder of the program assessed in this study, revealed that the cost of demolition (fees and labor) are

offset by recruiting households to volunteer in deconstruction that will supply materials to build their own houses (Costa, personal communication, September 13, 2010).

According to Kibert (2003), by spreading the advantages of recycling and recovering building reuse and disposal, recycling rates would increase from 10–20% to 60–70% annually, cutting demolition waste in half. This could be accomplished through a shift in design and policy, namely by "designing building products that can be disassembled and recycled and providing incentives for building reuse instead of new building" (Kibert, 2003, p. 85). For instance, government could enable pro-deconstruction policy by increasing demolition fees and providing tax advantages. This type of policy was implemented in Portland, Oregon, when disposal costs increased to USD $50 per metric ton and recycling rates of demolition waste increased from 20% to over 50% (Kibert, 2003).

The most important policy that sets the framework for construction and demolition waste disposal in Brazil is the resolution 307 implemented by CONAMA. Resolution 307 requires that municipalities develop an integrated plan for managing demolition and construction waste disposal. Brazilian cities such as Belo Horizonte, Ribeirão Preto, and Londrina have achieved some improvement towards conscious management of waste disposal by installing recycling plants (Carneiro, 2001). In Londrina, it is estimated that the construction and demolition waste disposal of the city produces daily enough amounts of construction waste that could be recovered and reused to build around 400 new housing units of 40 m^2. The estimative was calculated by Mauricio Costa based on data from 1998 when the local city hall granted 350

demolition permits. When carefully handled, deconstruction can yield reuse rates as high as 80% (Costa, personal communication, September 13, 2010).

Other Brazilian municipalities have been implementing measures for adequate disposal of construction waste such as the city of Salvador, State of Bahia. In Salvador, the company in charge of the maintenance of the city performs a variety of measures to educate the population on the importance of separating garbage and recyclable resources. Also, construction and demolition waste are processed and used to created road base materials and bricks. The project responsible for processing construction waste and producing new materials is known as 'Good Waste' (*Entulho Bom*) and has conducted laboratory analysis to assess the quality of the materials produced. Preliminary studies have shown that the materials are suitable for construction industry and the cost of recycled building materials is lower than conventional building materials (Carneiro, 2001). However, cultural aspects have a negative impact in approving recycled construction materials. Achieving successful rates of acceptance among the population seems a far-reaching goal to be accomplished (Carneiro, 2001).

Recovery, reuse and recycle of construction and demolition waste disposal are beneficial to the society as a whole, but especially to low-income families due to the fact that they often live nearby areas where waste disposal is irregularly dumped, and also because they need affordable building materials to house themselves.

This study describes a housing project implemented in Ibiporã, Paraná State, Brazil to better understand some housing issues and the possible solutions experienced in that country. This study hypothesizes that the recycling and reuse of construction materials combined with self-help strategies would significantly enhance housing

affordability. The objectives of the present study were fulfilled by evaluating the strengths and weakness of recovered construction waste for reuse based upon the measurement of costs saving, quality control of building materials and final results measured through residents satisfaction.

Housing Development in Developing Countries

Many Latin American cities have experienced intensive city growth. The highest growth was in 1960s and 1970s, which was extended to the 1980s and 1990s. This ongoing increase of the number people living in cities hampered living conditions and "well paid and secure employment in the public and formal sector was available only for a shrinking minority of the population" (Berner, 2001, p. 292). In an attempt to unveil the reasons people felt attracted to the cities, Berner (2001) explains that "most people flee to the cities because no matter how life there may be, it is generally better than the rural one they are leaving behind" (Berner, 2001, p. 293, citing Newsweek: Megacities 10 June 1996) and further suggests that although they might be living with no comfort whatsoever, the opportunities offered in the city outgrows the ones offered in rural areas.

The formal employment market was not the only segment that felt the consequences of the increase in number of city dwellers. In addition to unemployment, city dwellers had to deal with lack of housing given that "the formal housing market mechanism has failed to satisfy the rapidly increasing housing needs of the population" (Berner, 2001, p. 293). While in developed countries a household buys a formal lot and builds the house from scratch, buys a pre-built house, or rents; in developing countries "70% of housing investment occurs progressively—that is, households acquire land through purchase or invasion, and gradually improve the structure and legal tenure, and

lobby for basic services" (Ferguson & Navarrete, 2003, p. 309). It is estimated that "64% of the housing stock in low-income countries, and up to 85% of new housing, is unauthorized" (Berner, 2001, p. 293, citing UNCHS, 1996, p. 200).

The other alternative for households in developing countries to meet housing needs is "to wait for the chance to get a subsidized government project house" (Turner, 1967, p. 170). However, the majority prefers the informal squatting alternative—that is, "to buy and build in the lowest-priced subdivisions" (Turner, 1967, p. 170) and progressively work on housing improvements which occur through "windfalls, self-help agreements with friends and relatives, small loans (typically at extremely high interest rates), household savings . . . and other means over many years" (Ferguson & Navarrete, 2003, p. 313).

Turner (1967) did not approve the performance of the formal alternative by stating that government sponsored projects waste public resources, are uniform, and inefficient. "Limiting the allocation of housing units in specific projects to specific income groups—and of imposing specific housing types—naturally limits the social mix" (Turner, 1967, p. 178). Besides, he further complains that the governmental alternative fails to match the standards set by policy makers to households demands. Another obstacle for households that opt to rely on governmental housing assistance is the usual long waiting time that applicants have to face. For instance, on July 2009, the COHAB-LD in Londrina, Paraná, Brazil, the core city within the metropolitan region of Ibiporã, had 22,500 applicants (Londrina, 2009). This number represented only the demand for low-income housing since the income of these 22,500 people fitted within

what COHAB-LD considered low-income, that is, up to three monthly minimum wages[3], or R$1,395.00, (USD $835,30).[4] Alternatively, this means that in 2009, 90% of the housing deficit in Londrina belonged to the low-income bracket (Londrina, 2009). The waiting list at COHAB-LD has enrollments as old as 12, 15 years (Rosana Souza, personal communication, November 10, 2010).

Aforementioned, governmental sponsored projects have been criticized for wasting public resources, for prioritizing the will of policy makers over the needs of the demand, and for not attending the demand at a timely fashion, yet city dwellers have been able to overcome the barriers of social housing and managed to house themselves with little interference from the government and the formal sector (Ferguson & Navarrete, 2003; Sundgren, 2003). The ability of poor families in developing countries to succeed in achieving affordable housing through informality is discussed in the following topic.

Progressive Housing and Self- Help

Until the groundbreaking work of John Turner (Housing by People, 1976) the advantages of progressive housing over officially sponsored project had not been recognized (Berner, 2001). The work of John Turner introduced the need to include participation and self-help into the debate of affordable housing (Berner, 2001). The rationality for advocating in favor of progressive housing has become widely accepted because scholars have observed that poor families in developing countries have the ability to progressively house themselves through self-help, patience, and agreements with friends, relatives, and neighbors. That is, a low-income wage earner living in a

[3] In 2009, the monthly minimum wage in Brazil was R$465.00.
[4] Currency converter as of February 13, 2011 (USD $1=R$1.67).

developing country cannot afford to comfortably house the family in a good quality house located in a good area because the earning is simply not enough (Merrett & Russel, 1994). Consequently, low-income families in developing countries find their way out of homelessness and rental expenses by building and improving housing progressively through self-help.

Understand to what extent self-help and self-built are synonymous is a puzzling task. Self-help and self-build are often considered the same, but researchers might misjudge the complexity of these processes by assuming that “low-income households in self-help settlements build their houses themselves” (Gough, 1996, p. 640). Thus, researchers are challenged to reveal how the actors are involved in self-help construction by classifying whether the household does the job himself, hires skilled labor, or helps alongside with a paid worker, or relies on help from friends, relatives, and neighbors (Gough, 1996, citing Ward, 1982). Classifying the roles played by the actors involved is important to understand economic aspects of self-help. In general, low-wage earners cannot afford buying a good quality house, but can afford building it progressively or making improvements. The investment becomes more advantageous if their limited resources are invested continuously as their monthly income allows.

Indeed, financial investment is necessary to build a house, but “the improvement process takes place over years, even decades, and this helps spread the costs over time” (Merrett & Russell, 1994, p. 59). However, generalizations on how the resources are allocated could mislead research findings since progressive housing is autonomous and heterogeneous. Evaluating how much and how the resources were spent are tough questions to answer. In fact, relying on unpaid sources of workforce saves money that

could be spent on other aspects of improving the house. For instance, the definition of progressive housing by Turner (1967) is very appropriate for understanding economic maneuvers that low-income families undergo to have housing needs met:

> The owner-occupier-builder provides other resources in the form of initiative, skills, and time. The time, patience, and bargaining skills of most wage-earning families together with the myriad contacts through workmates, friends, and relatives often results in remarkably good value for precious money spent on materials and on hiring skilled labor. (p. 177)

Among constraints that prevent the poor from building a house are the high cost of building materials and lack of planning. “Building materials account for 60–65% of the non-land cost of housing in general and have been found to account for 86% of the cost of self-help housing” (Gough, 1996, p. 635, citing Agarwall, 1987), whereas the work done by relatives and friends accounts for decrease in productivity and inefficiency, and the poor planning done by skilled labor accounts for minimum design, lack of safety standards and lack of budget which in turn, leads to imprecise information about quantity and cost of building materials (Merrett & Russell, 1994).

Moreover, the chances of poor families to get approved for a loan at conventional financial institutions are low given that the criteria the banks set for eligibility are exclusionary (Merrett & Russell, 1994). Banks require proof of regular employment, but many low-income breadwinners work informally. In addition, banks exclude the poor by requiring a middle-high income, or by requiring proof of savings in a financial institution to have the loan granted (Merrett & Russell, 1994). Since when the National Housing Bank–BNH collapsed, another financial institution, namely Federal Savings Bank–CEF, has been the major agency in charge of financing housing programs in Brazil.[5]

[5] The role of BNH and CEF will be further explained in this chapter.

Considering that CEF is just another conventional financing system, low-income families seeking a loan have to be in conformity with the guidelines set by any financial institution.

As aforementioned, studies have shown that housing developments for low-income families lack the linkage between design criteria and users desire (Kowaltowski *et al*., 2006; Turner, 1967). Likewise, studies have placed high priority on designing more efficient and equitable housing programs in developing countries (Aryeetey-Attoh, 2001). Housing affordability in developing countries is associated with progressive housing, self-help and the role of the government.

Rethinking the Role of the Government in Housing the Poor

Mostly due to the government slow response to housing needs, scholars have been arguing that the state should enable ways to facilitate the development of housing by allowing partners to control managerial functions, and "increasing people's access to resources rather than grandiose housing projects" (Turner, 1976, p. 7). Similarly, scholars have argued that governments need to cease the traditional inefficient and ineffective way of implementing housing policies and instead, create non-conventional ways to finance housing.

The government should increase the myriad of options to finance housing for low-income families by allowing non-conventional financing systems such as savings and credits associations and financial associations to supply the resources (Merrett & Russell, 1994). Likewise, "the state must provide the legal and financial framework within which cooperatives, as corporate bodies, are created and operate" (Merret & Russel, 1994, p. 68). Allowing non-conventional financing systems to operate in self-help housing developments would increase the access to funding. Moreover, as usually

these small, non-profit institutions allow participants to get involved in planning and implementing projects, the chances of satisfying participants are higher than in governmental projects which for the most part, planning and implementing projects are exclusively tasks of policy-makers. As an illustration, architects and planners have been criticized for implementing unpopular designs and failing to attend the needs of poor households (Turner, 1976). On the other hand, “the larger the organization and the more centralized management becomes the more frequent and the greater the mismatches are bound to be between people’s housing priorities and the housing they get” (Turner, 1976, p. 51). Once again, “it is argued that housing and all other personal and locally specific services must be autonomous” (Turner, 1976, p. 17), and “just as places are not the same, all people do not have the same housing needs” (Schill & Wachter, 2001, p. 13).

In a more radical perspective, Berner (2001) defines the role of the government in the following terms:

> Given government’s limited resources and capacity they should simply abandon the role of housing provider and turn towards a truly enabling approach. In other words, they should contribute the essential ingredients, namely land, and leave housing production to people’s initiative. Effective cooperation between government and other actors, NGOs, and the private sector, is an essential element of the enabling approach. (p. 303)

On the other hand, Lang, Anacker & Hornburg (2008) suggest that when it comes to addressing a housing crisis, governments must take steps to address the root causes of the crisis, which combines a mix of poverty, unemployment, and low wages. Moreover, they state that in deregulated free markets without proper government oversight, poor people are victimized by predatory lenders. The government must regulate ruthless elements of a free market, so in case of failures the government will act as a safety net,

to make sure that no one falls through the cracks. Some argue that governments have an ethical responsibility to step in to remedy damages and place policies and directions in guaranteeing housing for the poorest (Lang, Anacker & Hornburg, 2008).

For the most part, the literature advocates that governments should have an enabling approach as opposed to managerial role on housing provision (Werna, Abiko & Coelho, 2002, citing Cook & Kirkpatrick, 1988; World Bank, 1983, 1989). There is a global trend to decrease direct participation of public agents and to strengthen participation of non-public institutions such as NGOs, communities, and private agents, through public-non-public partnerships. This does not mean that governments will be replaced by non-public agents, but indeed, shift position from provider to supporter (Werna, Abiko & Coelho, 2002).

Brazilian Housing Policies and Housing Apparatus

An Overview

Owning a house represents the achievement of a lifetime goal of people from different countries, beliefs, and cultures. However, one cannot deny the fact that countries, developed or in development have dealt with housing deficits or gone through harsh times to provide affordable housing and to maintain a wealthy financial scenario which favors potential homebuyers to invest in housing. For instance, the U.S. has not been able to accomplish the goal set by the Housing Act, legislation adopted in 1949, when the "Congress declared its goal of a decent home in a suitable living environment for every American family" (Schwartz, 2006, p. 1). For instance, the United States Department of Housing and Urban Development–HUD estimated that in the 1990's there were "a total of 14.75 million very-low-income households in the nation" (Christians, 1998, p. 131, citing Kirp, et al., 1995). Additionally, "all of these households

qualified for federal housing aid, but only 4.8 million families received it. There is only one publicly subsidized apartment available for every four families poor enough to qualify" (Christians, 1998, p. 131).

Likewise, Brazil's efforts to fulfill housing needs have not been successful since the adoption of articles 182 and 183 of the 1988 Federal Constitution, which provides guidance for housing development; establishes policies for urban growth; and presents measures for city management. The failure is likely due to the fact that housing and urban policies remained unguided until ten years ago, when in 2000, Amendment 26 altered the Constitutional Article 6 and recognized housing as a social right (Fernandes, 2007). Additionally, in 2001, Law # 10.257, also known as the City Statute (*Estatuto da Cidade*) was launched to guide the implementation of the above mentioned articles (Rolnik, 2001).

In 1946, Brazil launched the Affordable Housing Foundation–FCP (*Fundação da Casa Popular*), the first nationwide housing institution. The affordable housing foundation–FCP was in charge of running urban policies, financing construction, and searching ways to cheapen housing production (Azevedo, 1982). Silva (1992) suggests that FCP presented a poor and inefficient housing production system because public policies of this period were marked by paternalist actions of populist politicians. Consequently, the work developed by FCP was limited to favoring one state to the detriment of another (Silva, 1992). Likewise, Gomes, Silva & Silva (2003), suggest that housing policies implemented before the 1960's were narrow and shallow urban measures applied in just a few selected cities. Although the creation of the first Brazilian

housing institution is dated from 1946, it was not until 1964 that the country developed effective housing and urban plans.

In 1964, the National Housing Bank–BNH (*Banco Nacional de Habitação*) was launched to attend primarily to the housing needs of poor families. The bank was the most important institution within the Housing Finance System–SFH (*Sistema Financeiro de Habitação*) and allowed the government to manage the way the resources were handled. The resources to be used for housing projects came from the Guarantee Fund for Time in Service–FGTS (*Fundo de Garantia por Tempo de Serviço*), a type of unemployment savings through which employers are required to deposit 8% of their earnings in an FGTS account. Under FGTS's rules, the money deposited in the employees account can be withdrawn only to purchase a house or in case of unemployment. The money coming from FGTS resources were handled by BNH and destined exclusively for the construction of social interest housing. BNH transferred funding to the Housing Companies–COHAB (*Companhia de Habitação*) which were responsible for housing production upon submission of projects in compliance with the bank guidelines.

According to Gomes, Silva & Silva (2003), BNH played an important role in urban planning in Brazil. Primarily, BNH focused on housing, but the bank was also in charge of planning and financing urban development. Besides improving infrastructure services such as transportation, electricity, communication, the bank also invested in encouraging programs of education and culture.

The Housing Finance System–SFH was struck by financial turmoil between 1979 and 1985, when Brazil was experiencing a deep unemployment crisis and high inflation

rates. This system fell deeply into crisis since it was not designed to cope with fluctuating inflation rates and could not afford losing revenues generated by FGTS (Silva, 1989). The complexity of the problems brought about the financial turmoil involved a national economic slowdown, inflation, steadily increase of unemployment among the poor, budget cuts of housing programs, and increase in loan default rates due to unemployment.

Maricato (1982) and Silva (1989), pointed out the reasons the bank feel into a crisis and the consequences of it. Firstly, SFH initially expected that the bank would be able to provide resources in a self-sustainable way to steadily foment housing production. Nonetheless, raising funding to finance housing production depended upon FGTS assets and on ability of users to pay the loans (Silva, 1989). Secondly, the COHABs begun to apply rigorous criteria of selection through which loan would be released with proof of financial stability and income as high as five monthly minimum wages (Maricato, 1982). This change in criteria shifted the targeted public, which in turns, decreased the possibility of poor families to be eligible for a housing loan. Poor families eventually became excluded from the programs of the SFH and unable to pay rental expenses. As a consequence of the difficulties of participating in housing projects and the incapacity to pay for housing, poor families gradually moved to the outskirts of the cities, giving rise to illegal and irregular land squatting (Maricato, 1982). Likewise, Silva (1989), pointed out that BNH was conceived as a means to abolish the traditional patronage prevalent among politicians and to replace it by a more rational and far-reaching public policy. However, the author criticizes BNH due to a large gap between

the original purposes and actual performance, which contributed to widening the inequality gap.

Whilst resources were scarce due to increase in loan default rates and decrease in resources from FGTS, unemployed workers appealed to their FGTS accounts to withdraw funds which prevented the bank from using resources from FGTS leading to bankruptcy. A major shift in housing policy management occurred in 1986 when BNH collapsed and the Federal Savings Bank–CEF (*Caixa Econômica Federal*) inherited BNH duties. Maricato (1982) criticizes the fact that CEF became a financial agency in charge of managing FGTS resources to fund housing policies under government guidelines despite the lack of previous experience in managing housing programs.

The way BNH duties were incorporated into CEF is a subject of critiques among scholars. The government was accused of neglecting the housing segment firstly because CEF was never a housing agency and secondly because it remained attached to the Ministry of Treasury whilst housing, sanitation, urban development, and environment policies belonged to the Ministry of Environment and Urban Development (Maricato, 1982; Gomes, Silva & Silva, 2003; Silva, 1989).

In a nutshell, BNH was the core agency of the SFH and provided means to finance and apply public housing policies. After its collapse, the housing system faced identity crisis since the system no longer had a truly reference in housing to stand by. Although the bank has collapsed, the government has managed to overcome paternalist measures and assumed a mediator role between the public and private powers with regards to housing programs (Gomes, Silva & Silva, 2003).

The 1988 Constitution and the City Statute

Since the promulgation of the 1988 Constitution many institutional and legal changes have taken place regarding the urban reform in Brazil. Many progressive measures and institutions have been created, which have opened up new opportunities and combined legal reform, institutional change, and social mobilization (Rolnik, 2001; Fernandes, 2007). The Brazilian legislation on urban policy has made significant progress throughout the history and achieved the most relevant accomplishments in 2001 with the creation of the City Statute (*Estatuto da Cidade*) and later on, in 2003 with the establishment of the Ministry of Cities (*Ministério das Cidades*).

Critics have claimed that the legislation and lack of political commitment explain the reasons why Brazilian urban growth and housing policies have been implemented through informality and illegality. For instance, Fernandes (1997) attributes the outcomes of an uncontrolled urban growth to the Brazilian legal system and the government slow responses to the process brought by the development of cities. Fernandes argues that before the promulgation of the 1988 Constitution there was no proper planning apparatus, or reinforcement institutions in action. The scholar further states that the national legislation available at that time did not cover comprehensively many aspects of the urbanization process. Lastly, he notes that land invasions, land divisions, and self-construction are the processes which have ruled and determined the configuration of urban structures in Brazil and the planning strategies to house the urban poor. In conclusion, one may state that as a consequence to the lack of consistent public policies that triggered the growth of informality, both urban growth and housing remained ignored for many years.

Up to 2001, the government used to be criticized for not having basic institutional infrastructure and for not stimulating the implementation of comprehensive urban land policies. The management of urban land development remained unguided until the promulgation of the 1988 Brazilian Constitution (Fernandes, 2007). The articles 182 and 183 of the Constitution make dispositions about housing, establishes policies for urban development, and present measures for city management. Further, in 2000, these articles were modified by the amendment # 26 that recognizes housing as a social right and makes dispositions about land tenure. Fernandes (2007) observed that these two constitutional articles enabled the "right to the regularization of consolidated informal settlements to be applied through the approval of new legal instruments" (p.180).

Although the Constitution enabled some progress towards more democratic urban development, the Law # 10.257, also known as the City Statute was launched to rule these urban politics articles of the 1988 Federal Constitution (Rolnik, 2001). This law has enabled several reforms toward equity, efficiency, transparency, and citizen participation. Moreover, the City Statute is in charge of defining the social function of cities and urban properties. It delegates to each city the responsibility to formulate its own urban social package. This groundbreaking urban legislation launched in 2001 defines urban property, guides municipalities, and provides instruments and incentives popular involvement. Such legislation acknowledges the importance of fomenting participatory and democratic decision-making processes in a more humanized urban scenario (Instituto Pólis, 2001; Rolnik, 2001). Further, the City Statute contemplates instruments for land tenure regularization that amplifies the possibilities of linking the

informal city to the general urban fabric by breaking down exclusionary practices (Fernandes, 2007).

The City Statute stimulates a new legal-political foundation for land use and control of urban development. It encourages municipalities to make use of urban legislation that fosters the enactment of the social function of the city (Osorio, 2007). Municipal governments are now required to create strategies to control urban development and to formulate land use policies that attend both, the interests of landowners and other groups of the city (Instituto Pólis, 2001; Fernandes, 2007). Henceforth, urban land is considered an essential resource to the development of cities and the municipal government must create ways to promote its balanced use between the different groups of interests (Instituto Pólis, 2001).

The City Statute reveals great concern on ensuring more democratic decision-making process. Municipal governments are required to ensure public participation by sharing planning processes, legislation approval, and policies to the local decision-making process (Rolnik, 2001). Mechanisms such as public hearings, consultation, counseling, are perceived to effectively guarantee citizen participation. The City Statute opened up new possibilities of intervention through a new definition of urban planning (Rolnik, 2001). However, achieving success depends strongly on the municipalities abilities and efforts to plan and execute practices that suit legal, social, and environmental conditions of the urban areas (Rolnik, 2001). Similarly, it is important to stress that in order to effectively apply the instruments and policies proposed by the City Statute the municipalities will need to approve adequate master plans and to reform the overall regulatory and institutional frameworks (Fernandes, 2007).

Ministry of Cities

In 2003 the Ministry of Cities was created to fight back social inequalities, to change cities into humanized urban spaces, to amplify the access to housing, sanitation and transportation (Brazil, Ministry of Cities 2011, b). The Ministry of Cities is the result of claims from popular movements to regularize informal settlements and minimize poverty issues related to housing in Brazil. Since then, most of the housing and urbanization programs have given priority to approaches that foster land tenure regularization, in-site improvements, and increase of connectivity between informal and formal cities.

The Brazilian government has acknowledged that since 1988, when the Constitution was established, the urban legislation has been poorly implemented (Brazil, Ministry of Cities 2011, b). Yet, the City Ministry does not stand against the orientations made by the Federal Constitution and, therefore, reinforces decentralization and local empowerment. Municipalities are encouraged to create their own projects based on their local reality and submit proposals to the federal level as well as to send requests for assistance related to subjects that matter to the City Ministry. The National Office of Urban Programs (*Secretaria Nacional de Programas Urbanos*) is responsible for evaluating these projects. This office focuses on four areas—elaboration of master plans, land tenure regularization, rehabilitation of central areas, and prevention of vulnerabilities associated with precarious settlements (Brazil, Ministry of Cities 2011, c).

Plenty are the complaints regarding the attitude of the urban legislation, policies, and governments. First, whether there is a need to prevent invasions in urban areas, to revitalize environmentally fragile areas, or to provide affordable housing, the Brazilian urban and housing policy has been historically planned to amend vulnerable situations

(Fernandes, 2007). Measures to control the growth of informality and to attend the demand for housing have been formulated mostly to alleviate situations already established. Another evidence of this tendency is the fact that federal banks have heavily influenced and financed housing programs in Brazil. This has hampered poor households to get approved for loans, given that they often do not have a stable and well-paid job (Fernandes, 1997; 2007). Likewise, not long ago, the state used to prioritize private property rights over public rights by reinforcing a prohibitive legal order (Fernandes, 2007). Nevertheless, the Ministry of Cities has assumed the commitment to make out for the past approaches and reinforced the need to develop sustainable and continuous projects (Brazil, Ministry of Cities a, 2011).

Lately, the Brazilian government has showed concern and commitment to urban dwellers by amending legislation, developing up to date practices, and sharing decision-making process. Until recently, the majority of the activities were concentrated on upgrading physical conditions and on implementing infrastructure services. More and more community engagement policies have been fostering job and income generation and easy access to services such as transportation, education, and health care as supported by UN-HABITAT (2003, 2004). In spite of these activities, the literature reveals that segregated policies are merely remedies to specific issues (Fernandes, 1997, 2007; Rolnik, 2001). On the other hand, by combining policies, governments may stimulate many social aspects at once. Providing decent shelter is a battle that engages poverty alleviation, popular empowerment, citizenship, and political engagement (UN-HABITAT, 2004). Much has been done and much still has to be done, but Brazil has

improved its legal and institutional apparatus by taking approaches that prioritizes the collective welfare of the urban dwellers.

Table 2-1. Brief overview of deconstruction measures in selected countries and results achieved.

Country	Deconstruction measures and results achieved
Australia	80% of the material disassembled from old timber houses are reused for renovation of existing houses or in the construction of new house identical to the one dismantled. Up to 80% of concrete is processed and reused in construction. Roughly, 50 to 80% of wastes are recovered in demolition of residential units.
Germany	25% of demolition waste is concrete and 50% is brick and stone. The recovery rate is as high as 95%. The country has been conducting several studies and research assessments on deconstruction features.
Israel	Due to the type of construction which limits deconstruction and material reuse and people's rejection of using construction waste materials, deconstruction activity is low.
Japan	Construction waste accounts for 20% of the country's industrial waste and 90% of the waste are illegally dumped. The country has a serious problem with illegal dumping since the law which rules waste disposal was passed in 1970.
The Netherlands	The country has strict waste disposal rules and therefore, a high rate of recovery. About 80% of construction and demolition materials are reused usually in creating road base materials.
United Kingdom	Almost half of the annual amounts of construction and demolition waste are recycled.
United States	Deconstruction and reuse have become more frequent in areas where demolition and waste disposal fees are higher than USD $50 per ton. Currently, NGOs and the federal government have been leading such measures.

Source: Kibert & Chini, 2000. Table by author.

CHAPTER 3
METHODOLOGY

Selection and Implementation of the Case Study

The potential of recycling and reuse of building materials as an alternative to improve housing affordability was investigated in this study. The selected program is known as 'Where you Live' and was implemented in Ibiporã, Paraná, southern Brazil. In an attempt to understand this global trend, this research analyses the roles of this program managed by a non-governmental organization–NGO, the original goals of this organization, the changes the program has experienced over time, and its effectiveness within the current affordable housing scenario in Brazil.

The study relies on qualitative research methods of assessment based mostly on case study, interviews, surveys and research and analysis of archival records, listed by Yin (2009) as organizational records (charts and budgets over time) and classified by Kumar (2005) as newspapers and official government data.

The field research included data collection from public and non-governmental agencies, namely— the Federal Savings Bank–CEF and the headquarters of the 'Where you Live' program—, visits to the department of social work in the city of Ibiporã, visits to the Village Hope (*Vila Esperança*)–the selected case study of this research, interviews with housing agents from both Londrina and Ibiporã, and survey with residents.

The material collected at CEF includes technical reports, agreement terms, summary budget, inspection reports, and financial schedule. These official documents were of crucial importance to answer the hypothesis of this research regarding cost and schedule, quality of the urban space, project management and community participation.

These documents revealed essential aspects of the investment, such as the cost of the units, the components of the budget, the work plan, and resource allocation. Besides, the data exposed information pertaining to the criteria of participation, organization of the work in the construction site, and features of the neighborhood.

Valuable information was also obtained from the department of social work in Ibiporã. For instance, the interview conducted with two social workers involved in the featured housing project provided information about site selection, profile of the families, strategies used to motivate volunteers, evaluation of the way the project was implemented, listing of positive and negative aspects of the project, among others subjects discussed in Chapter 5.

Employees from the NGO 'Where you Live' program provided information about the original goals of the organization, how it has changed over time, and how effectively it functions within the current context of affordable housing. Newspaper and magazines articles and institutional videos from the organization archives provided the basis for explaining the rationality of the organization which is described in Chapter 4.

The surveys were used to characterize the residents regarding their education, income, occupation, as well as to portray residents emotions and opinions regarding housing situation, housing satisfaction, housing quality and experience for participating in the project.

Case studies are particularly useful in depicting a holistic portrayal of a client's experiences and results regarding a program (Kumar, 2005). Besides, a case study offers the necessary conditions to organize a wide range of information about a case and then analyze the contents by seeking patterns and themes in the data (Kumar,

2005). Case studies are used when the research seeks to understand how a social phenomenon works. According to case study expert Robert Yin, “the more that your questions require an extensive and in-depth description of social phenomenon” (Yin, 2009, p. 4), the more relevant the case study is. Due to its large array of possible applications, case studies have been applied to conduct research in psychology, sociology, political science, social work, anthropology, community planning, and education.

The case study chosen for this analysis is the housing project implemented in Ibiporã by the ‘Where you Live’ program. The community known as Hope Village was granted with the construction of 30 housing units. The organization in charge of implementing the project follows nonconventional ways to build houses namely—reuse of construction waste and self-help construction—that combined, have significant downward pressure on housing costs and hence, increase affordability. Despite that some of the funding resource which financed the housing project in Ibiporã came from the government, the history of the NGO ‘Where you Live’ is that of a housing program concerned with reducing production costs and enhancing housing affordability. For this reason and for the purposes of this study, analyzing this program as a nonconventional way to provide affordable housing is valid.

Due to the nature of data required, the questionnaire method was used to access primary data from stakeholders in the production, delivery and consumption of affordable housing in Londrina (including those people working in public and non-governmental agencies).

Interviews and Residents Survey

Interviews were conducted to better understand how the program works, how the project was implemented and what were the outcomes. “Most commonly, interviews are of an open-ended nature, in which you can ask key respondents about the facts of a matter as well as their opinion about events” (Yin, 2003, p. 90). Not differently, the interviews furnished this research with opinions of agents engaged in housing activities at both public and non-governmental organizations and with experiences of social workers in charge of running housing projects. In addition, an interview was conducted with a professor at the State University of Londrina whose expertise in public policy evaluation provided helpful insights for enhancing the critical approach of the research.

Where appropriate information does not already exist, household surveys were carried out in selected case study area, with surveys that contain a combination of closed and open-ended questions. The survey forms a basis for selecting in-depth qualitative household case studies to explore motives, behavior, and perceptions (Kumar, 2005). Residents’ surveys were conducted from 1 to 3 of November, 2010. The intent was to interview all households, however this was not possible as the survey was undertaken during working time. Yet, 14 households out of 30 families were surveyed. At first, respondents were told about the rationality of the survey and asked to sign the informed consent (Appendix A).[6] A combination of closed-ended questions provided information on households profile, income, education and employment, whereas open-ended questions reflected the opinion of participants in relation to the project planning, development and outcomes. Data collect in the survey was plotted and presented in pie

[6] Survey questions and informed consent were approved by the Institutional Review Board (IRB).

charts for better visualization of the outcome (Figures 5-6 to 5-10). Pictures were taken to provide visualization of the current design of the houses and to compare it with the original design from November 2005, when the houses were finished and residents moved in.

This methodology provided strong support for a better understanding of the topic and helped answering whether recycling construction wastes and self-help could have a downward pressure on housing affordability. The material presented here is derived from a mixture of interviews, survey and archival research. The data collected during fall 2010 represents the views of public officials, consultants, residents, and housing specialists interviewed in Londrina and Ibiporã, Brazil.

CHAPTER 4
‘WHERE YOU LIVE’ PROGRAM – *PROGRAMA ONDE MORAS*

Background Information

Launched in 1996, the non-governmental organization–NGO known as ‘Where you Live’ program has been building houses for low-income families and for people living in conditions of extreme poverty. The houses built by this program saves resources on both building costs and on construction materials since the featured program relies on residents workforce and reuses construction wastes to build new housing units. Usually, up to 70% of the materials used are recycled, whereas the remaining materials come from partnerships (Maurício Costa, personal communication, September 13, 2010). During the initial years, the program acted mainly in the city of Londrina, Paraná State, Brazil. Later, it expanded the activities throughout the metropolitan area of Londrina and to the whole State as the program won state-wide acknowledgement. The program counted on several institutions such as public and private agencies, the Catholic Church, the Ministry of Cities, the Federal Savings Bank–CEF, the Housing Company–COHAB, and the Federal Police.

The founder of the program is the engineer Maurício Costa. Costa idealized a housing program to assist low-income families living in precarious housing conditions which would foment both community engagement and reuse of construction wastes. The main goal is to provide decent housing at very low construction cost. Thanks to the partnerships established through the years and to low cost of construction, not a single beneficiary had to pay for the houses. Construction wastes such as building materials obtained from houses in poor conditions, abandoned warehouses, or any type of building in disuse are recovered and reused to build new houses. The program receives

donations and performs a careful demolition and selection of the materials to be reused in the construction of new housing units.

Given its non-governmental nature, the program was initially acknowledged as an NGO but in order to establish partnerships and sign contracts with CEF, the program later upgraded its institutional foundation by reformulating the legislation and mission. This change happened so the program could fulfill the requirements set by the Ministry of Justice to become a Civic Society Organization of Public Interest–OSCIP (*Organização da Sociedade Civil de Interesse Social*), in accordance with the federal law 9.970/1999. In its hometown, Londrina, the program is also acknowledged as an institution of public utility.

The program offers opportunities for establishing partnerships for those in need of a house by recruiting households to volunteer during demolition and construction processes, both developed by self-help workers and with the guidance of engineers. In order to have the right to participate, the program mandates that the beneficiary must provide one person to engage in the self-help work even if the person has no connections to the receiver family. In other words, the person engaging in the labor could be a relative, a friend, or skilled labor, but given financial constraints, the majority of volunteers were from the receiver family or close relatives. Due to the fact that while working for the program many breadwinners would be unable to manage another job the program monthly offered one food basket and bus tickets as a means to assist with their household expenses.

In brief, the idea of the program is simple—involves recycling and charity, social and environmental concerns. As a result, huge amounts of construction waste that were

being unutilized are reused to build homeownership dreams while saving the environment from receiving large amounts of waste.

Housing Production and Partnerships

The 'Where you Live' program has built a total of 386 housing units over a period of 12 years (Table 4-1). From 1996 to 2002, 49 housing units were built without any assistance from partners. During this period, communities and the society were the main sponsors of the projects, through donations and hands-on assistance in the construction site. After this period, partners were incorporated and the popularity of the program increased as so did the number of units built. The partnerships were essential to increase the reach of the program to the city, to the metropolitan area, to the Paraná State, and to the country (Figure 4-1).

The program remained anonymous up to 2002, when the first partnership was established with a private institution and had a major impact in the media. A 350 m^2 building used as the infirmary of a shelter home for elders was demolished and the construction wastes were enough to build four brand new houses. In an interview given to the Londrina Newspaper (*Jornal de Londrina – JL*), Costa appealed to public and private institutions and to the society as a whole to donate both construction wastes and construction materials which cannot be reused such as lime, cement, sand, and stone. Additionally, Costa stressed that R$1,500.00 (approximately USD $898,20) were necessary to buy the above mentioned new construction materials (Garis, 2002).

Furthermore, in 2004, the program established a partnership with the Correctional Institution of Londrina–PEL (*Penitenciária Estadual de Londrina*) through which inmates were released exclusively to help as workforce during the demolition and construction processes. This partnership meant an alternative to the correctional system which

awards to inmates the right to fulfill their sentence in a semi-open system depending on the charge.[7] Inmates are allowed to work outside the correctional system but must come back to the lodge located in the boundaries of the prison after the workday. Londrina faces an issue regarding this matter because the city correctional system does not have enough accommodations in the lodge for the inmates under a semi-open correctional status. Before the partnership, the inmates were being taken to either Curitiba or Foz do Iguaçu, both in Paraná State, to work in agricultural activities but given the distance from Londrina (approximately 388 km and 507 km, respectively), escapes of inmates were frequent.

The inmates received compensation from the government for the work done at the program of 25% of the monthly minimum wage and the subtraction of one day from the sentence for every three days worked, explained Roberto do Valle, judge responsible for the partnership (Rigi, 2004).

In 2005, a single wooden house was built through a donation made by the Environment Agency–SEMA (*Secretaria do Meio Ambiente*). Trees that were going to be pulled out and discarded were donated to be used in the construction of a new house. According to SEMA, the city removes about 250 trees monthly either because are located in inadequate areas or because are in terminal condition. Of these, about 100 trees could be used in the construction of houses (Galembeck, 2005). Costa explained that while a brick house takes around 40 days to be built, 10 days are spent to build one with wood (Maurício Costa, personal communication, September 13, 2010).

[7] Inmates obtain the right to the semi-open system as an award for good behavior and after have completed 1/6 of the sentence.

Despite of the efficiency of timber used in housing construction only one unit resulted from this partnership.

The greatest amount of construction waste ever collected by the program was obtained from the demolition of a building known as Students House (*Casa do Estudante*), a place designated to shelter low-income students. The amount of material attained from the deconstruction was considered enough to build seven new housing units (Mattos, 2005). Following, in 2006 and 2007, the Federal Police awarded the program confiscated merchandises which were sold to generate funds for the acquisition of brand new construction materials.

Attempt to Expand the Program to the Whole Country

The partnerships above described remained tight through the years and kept on assisting the program with donations of construction wastes and monetary funds, but none was as significant as the one established with the government. In 2004, the program engaged in negotiating a pilot project to be implemented in Londrina. The partnership between the program and the government was mediated through the City Ministry and CEF, the bank in charge of financing housing in Brazil. This attempt to implement a pilot project in Londrina meant a possibility to make the State of Paraná an experimental site for expanding the program to the entire country.

The deal between the program and the CEF established that COHAB would be in charge of dealing with bureaucratic matters such as writing reports, conducting surveys, selecting participants as well as developing any activity related to guiding and instructing participants. The governmental program responsible for providing funding known as Social Housing Subsidy Program–PSH (*Programa de Subsídio à Habitação*

de Interesse Social) transfers the money directly to the financial agency which in turn takes charge over the expenses.

Despite the fact that the main goal of the ‘Where you Live’ program is to achieve affordability through charity, this partnership increased the final cost of the houses. As a result, the cost of a house that was between R$1,500 to R$2,000 rose to R$6,000 despite the fact that the program continued to rely on donations and recycling construction wastes. However, the price increase was not unreasonable. The size of the house remained the same but the resource was allocated towards improving finishing touches such as plastering walls, painting the entire house, tiling the floor, and providing a sidewalk surrounding the house as well as hiring specialized labor such as plumbers, electricians and bricklayers to improve and intensify the work developed by the community.

Even so, the partnership CEF–‘Where you Live’ program turned out to be financially advantageous as the cost of producing a house exclusively with brand new materials financed by the same governmental program (PSH) is R$11,270.00 (USD $6,748.50). Furthermore, due to the fact that CEF was responsible for watching over quality and safety matters, governmental headlines and standards drawn by the City Ministry were expected to be followed. Thus, allocating resources towards improving quality and safety was a requirement set by PSH.

Table 4-1. Number of housing units built by the 'Where you Live' program by municipality, year, and partner.

Year	Municipality[a]	Partner[b]	No. of units
1996 to 2002	Londrina/PR	Community and society	49
2005	Londrina/PR	SEMA	1
2005	Ibiporã/PR	CEF, community, city hall, private institutions	30
2005	Assaí/PR	CEF and private institutions	20
2005	Jataizinho/PR	CEF and private institutions	10
2005	Londrina/PR	CEF and private institutions	52
2006	Londrina/PR	CEF and private institutions	77
2007	Londrina/PR	CEF	16
		CEF, SEMA, PEL	6
2007	Cafeara/PR	CEF	16
2007	Alvorada do Sul/PR	CEF	14
2008	Londrina/PR	CEF	41
2008	Tamarana/PR	CEF	12
2008	Apucarana/PR	CEF	25
2008	São Luís/MA	CEF	17
Total			386

Source: Information gathered through analysis of archival records at the headquarters of the 'Where you Live' program. Table by author.

[a] PR and MA, Paraná and Maranhão States, respectively.

[b] SEMA, Environment Agency (*Secretaria do Meio Ambiente*); CEF, Federal Savings Bank (*Caixa Econômica Federal*); and PEL, Correctional Institution of Londrina (*Penitenciária Estadual de Londrina*).

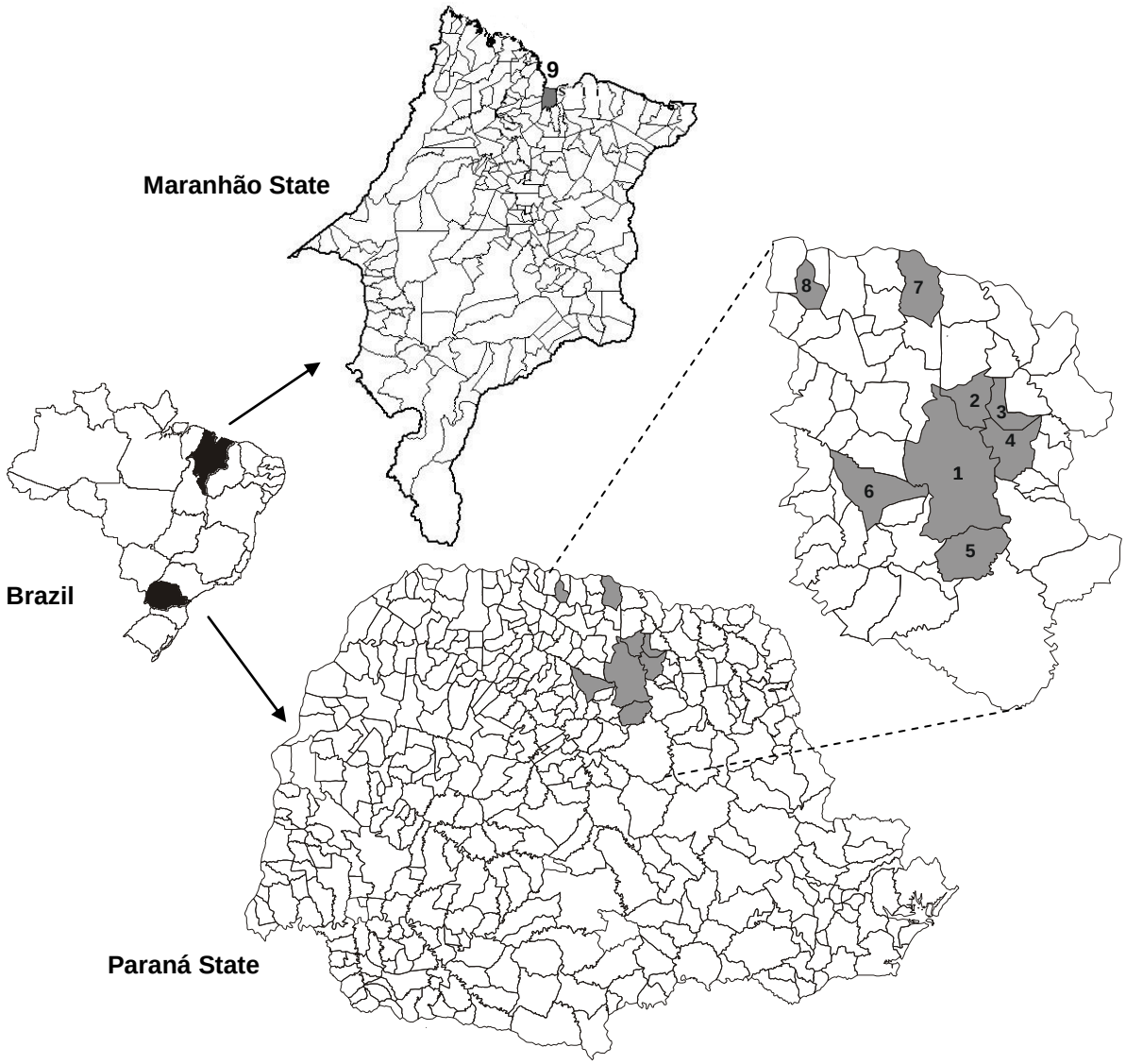

Figure 4-1. Map of Brazil, Paraná and Maranhão states showing the municipalities where the 'Where you Live' program has been implemented. Numbers indicate the participant municipalities: (1) Londrina, (2) Ibiporã, (3), Jataizinho, (4) Assaí, (5) Tamarana, (6) Apucarana, (7) Alvorada do Sul, (8) Cafeara, and (9) São Luís. Source: Figure by author.

CHAPTER 5
CASE STUDY ASSESSMENT: HOUSING PROJECT IMPLEMENTED IN IBIPORÃ, PARANÁ, BRAZIL

Ibiporã City

Away 407 kilometers from the State capital, Curitiba, and 14 kilometers from Londrina, Ibiporã turned 63 in 2010, and although the city has grown in size and population throughout the years, it has kept the welcoming feeling of a countryside town. The proximity to Londrina, the core city of the metro area, has favored citizens from Ibiporã to have access to universities and to a wide range of job opportunities. Yet, Ibiporã remains a small city of 48,200 inhabitants offering good living conditions.[8]

Access to safe water prevents people from being exposed to health-threatening situations. UN-HABITAT (2003) warns that the risks involved with scarce and unreliable water sources normally lead to a multitude of health problems that significantly impact on livelihoods. In Ibiporã, water supply and sewage system are managed by the Autonomous Municipal Service of Water and Sewage–SAMAE (*Serviço Autônomo Municipal de Água e Esgoto*) which provides water and sewage services to 100 and 97% of the population, respectively (Araujo, 2010). The availability rate of these services in Ibiporã stands out when compared to other cities from Paraná State and the country (Table 5-1).

To improve transportation, the Integrated Transportation System was designed in 2004 to allow passengers to travel to destinations within the metro area without having to buy more than one ticket. This way, a passenger spends a single ticket from any bus

[8] Ibiporã is a small, country side city of 48,200 inhabitants (IBGE, 2010). The majority of the population is urban (45,896) whereas the remaining 2,304 lives in rural areas. In 2000, 42,153 people were living in Ibiporã (IBGE, 2000a). In 11 years the population had an increased of 6,047people.

stop in Ibiporã to any destination within the metro area. Furthermore, studies and surveys have been conducted to assess the demand for implementing a railroad system from Ibiporã to Paiçandu, passing by 11 other cities.[9] The survey was scheduled on March 2010 and expected to contact 40,000 people in 13 municipalities participating in the railway line, which corresponds to 2% of the attended population of this area (Ayres, 2010). The railway line known as “Dirty Foot” (*Pé Vermelho*) is planned to be launched and link the north and northwest of Paraná in 2013.[10]

Housing Project Implemented in Ibiporã

Project Plan and Development

On July 2004, the Federal Savings Bank–CEF, the municipality of Ibiporã, and the non-governmental organization–NGO, sealed the deal to build 30 housing units. A member of the beneficiary families with incomes ranging from R$150,00 to R$250,00 (USD $89,80 to USD $149,70, respectively) composed the construction team and received monthly one basket of food while engaged in the construction labor. Each housing unit was estimated to cost R$6,000 (USD $3,590). However, thanks to the partnerships with the city hall and CEF the beneficiaries did not have to pay for the units.

The families were selected by a team of social workers that chose the participants based on monthly income and working conditions, in a way to assist the

[9] Londrina, Cambé, Rolândia, Arapongas, Apucarana, Cambira, Jandaia do Sul, Mandaguari, Marialva, Sarandi and Maringá, are the cities in which the railroad will have a station.

[10] The literal translation of the name of the railway line would be “Red Foot” (*Pé Vermelho*). This term is used to refer to peasants and to people living in the countryside and working in agricultural activities. The name “Dirty Foot” was chosen to indicate the type of landscape and environment the passengers will experience – that of agriculture and rural life. The railway is intended to serve both commuters and tourists.

most needed ones. The selected families were mostly composed by users registered under the social welfare system and worked informally as waste pickers. Given their informal working conditions, the social work team was present at all times to assess whether the families needed further assistance to thrive in the project. Additionally, this team was in charge of carrying out users surveys to evaluate life quality and community engagement.[11]

The social welfare system is a digital tool used exclusively by social workers and allows these professionals to communicate among their working class and facilitates the triage process. Social workers are in charge of allocating welfare aid to families living in poor conditions. This system is the tool used to assign aid and to keep record of where poor families live and whether their living conditions has improved or worsened. The social work team in charge of selecting the families to participate in the housing program received a number of profiles of families registered under the social welfare system and made a decision based on income, working and living conditions. In order to be eligible to participate in the housing program the monthly income of the family should be between R$150,00 to R$250,00 (USD $89,80 to USD $149,70). Also, since the program aimed at assisting families living in fragile working conditions, none of the family members could have a formal, registered job. Lastly, the selected families represent the most needed ones in terms of basic living conditions (e.g., families living under health threatening conditions and under threat of eviction).

Despite the fact that the team in charge of allocating participant families elaborated a set of eligibility criteria, a few families revealed that the social work team

[11] For more detailed representation of the project developed by the social work team, see Table 5-2.

contacted them and insisted for them to participate. Also, there were a few situations in which the mayor interfered and chose the families himself. Sadly, public institutions provide opportunity for patronage and clientelism (Valença, 2007). The housing sector in special “has often been accused of being a stronghold of clientelism in Brazil” (Valença, 2007, p. 391). Valença (2007) claims that because political institutions are week, politicians operate patron-client relationships. The housing system has long served the interests of politicians, has maintained political arrangements and chosen to satisfy political needs over the housing needs of the poor (Valença, 2007).

Thirty units of 40 m^2 disposed as follow—kitchen, bathroom, living room, and two bedrooms (Figures 5-1, 5-4 and 5-5)—were built in a 261.25 m^2 lot donated by the City Hall of Ibiporã (Figure 5-2) in a community known as ‘Hope Village’, located three kilometers from downtown. By the time the construction started, the region was already furnished with public facilities such as sewage, electricity, water supply, bus stop, street pavement, soccer field, gymnasium, health center, and daycare. The project was initially schedule to be completed in six months, but ended up exceeding the schedule.

On June 28 of 2004, the mayor of Ibiporã, Reinaldo Gomes Ribeirete and the president of the NGO, Maurício Tadeu Alves Costa, signed an agreement term that celebrated the partnership to build 30 housing units in conformity with the guidelines of the Social Housing Subsidy Program–PSH established by the City Ministry and financially managed by the CEF.

A document entitled ‘agreement term’ defined both the NGO and the city responsibilities. The first was in charge of implementing the work plan and ensuring an efficient and good quality job, managing expenditures and contracting workforce. The

later was accountable for supervising the performance of the NGO, transferring funds, creating a committee to evaluate the progress of the work, and arranging the delivery of construction wastes such as tiles, bricks, timbers for the roof structure, windows, doors, kitchen sinks, laundry tubs, and toilets.

In accordance with a 'technical report' made by a civil engineer from CEF, the plan was to finish ten housing units every two months, thus, the 30 units would be finished in six months. The money would be monthly released starting in August 28, 2004 until January 28, 2005 upon accomplishment of the work and submission of receipts. Likewise, the NGO was in charge of composing a financial report assessing all resources and assets received from the public sector within sixty days after the end of the agreement term. This report would also show a comparison between the proposed goals and achievements. Lastly, the agreement term indicated the possibility of extending the deadlines upon necessity to comply with the goals.

The initiative to carry on this housing enterprise came from the president of the NGO, Mauricio Costa. Costa had visited Ibiporã several times to propose a partnership with the mayor, but the city could not engage in a housing project which relies on donations of construction wastes because the city did not have often demolitions that would provide the materials to furnish construction assets to the project nor funding to handle such project on its own. Nevertheless, once the program won local and national awards, achieved recognition and established partnership with the federal government, Ibiporã qualified to participate since the city would rely on public resources.

On Saturday July 31 of 2004, hundreds of volunteers and representatives of charity institutions engaged in a huge task force to collect donations for the project. In

preparation for this day, there was a month long campaign to advertise the project and the need to donate construction wastes. Besides, the city hall invited entrepreneurs, CEOs of commercial and industrial sectors, representatives of churches and NGOs to participate of fundraising breakfasts. This campaign raised almost 1,900 bricks, 5,400 clay roof tile, and tens of toilets, sinks, laundry tubs, doors and windows (Araújo, 2004).

In addition to the task force day—which was the major step to gather building materials—a phone line was set up to continually attend requests from citizens to provide volunteers and trucks to collect construction wastes or to assist in demolitions. Likewise, the fact that Costa is a popular entrepreneur well-known among people engaged in construction business, favored the city to raise building materials. Accordingly, Costa's linkages to the city hall in Londrina and access to demolition permits allowed him to find out about upcoming demolitions first hand.

Site Selection and Features of the Vicinity

The Department of Planning was assigned to select an area suitable for housing development and furnished with infrastructure and public facilities within the surrounding neighborhood. Additionally, it was important to find a land lot where the 30 units could have been simultaneously built to facilitate the distribution of construction materials and to guide workers and assure attendance in the construction site. Equally important was to select a site in conformity with CEF guidelines which requires approval from the Paraná State Environmental Agency–IAP (*Instituto Ambiental do Paraná*), approval from the engineering department at CEF, and notarized proof of ownership (Raquel Ralisch, personal communication, January 24, 2011).

As described in a document entitled technical report, the selected site presented a semi-flat topography and rectangular shape, situated in a region of normal density in

Ibiporã. The total land size was 193,808.85 m^2 (approximately 19.3 hectares), subdivided in 34 parcels spread in a single rectangular block. Each housing unit was built in parcel of 261.25 m^2. The construction took place in 30 parcels and four parcels remain vacant for different reasons. Parcels number 17 and 18 are still vacant (the larger ones, located at the corner of the lot), but were supposed to host a plaza, parcel four could not be used as it did not belong to the city, and parcel 34 was inappropriate for building a house because the lot was sloped (Figure 5-2).[12]

According to the 'technical report', the city was responsible for conducting repairs in the rainwater drainage system and fixing up a drainage issue observed in both lot three and four, as well as bulldozing and flattening the site for the construction. The city was liable for the cost burden of these infrastructure services which can be seen on Table 5-3.

Self-Help and Work Development in the Construction Site

As previously mentioned, the majority of the selected participants were working informally with waste picking, unemployed and undergoing harsh financial situation. The city hall hired skilled labor such as bricklayers, an electrician and a plumber to assist in the construction and to train volunteers and monitor the work. Residents, relatives and friends assembled the workforce team and received a food basket and bus tickets to aid with household expenses. The commitment with the project meant that participants would have to spend working hours at the construction site, but the project did not prevent participants from engaging in paid-working activities.

[12] The municipality's patrimony was registered under the Development Company of Ibiporã - CODESI (Companhia de Desenvolvimento de Ibiporã). Parcel 4 belongs to a private owner. The houses are numbered as follows: 1 to 3, 5 to 16, 19 to 33.

Initially, the project team expected that waste pickers would have no difficulties to carry on the work in the construction site because this working group is used to harsh labor conditions (Angela, personal communication, October 20, 2010). However, the social work team identified some issues regarding specific working skills. For instance, there were a couple of participants whose laboring skills in waste picking were highly productive, but utterly inefficient in construction (Angela, personal communication, October 20, 2010). Hence, the progress of the work was hampered by the lack of specific laboring skills.

The project team expected that the construction work was going to be efficiently developed given the participants informal working conditions and flexibility to work. However, the construction work was initiated on July 2004 and the houses were delivered on November 2005. As aforementioned, the work schedule anticipated finishing the project in six working months, but the project took ten additional months to meet all the established goals and commitments established. As an illustration, inspection reports from the engineering department at CEF shows that on March 2005, only 39% of the work had been completed, indicating a 78-days delay. Following, the reports of April, May and June showed that 53, 57 and 63% of the work had been completed, respectively.

As the residents realized the delay, the social work team felt the pressure of coming up with mediation strategies to appease the frustration of working for several months as volunteer in exchange of a house that never finished being built. Additionally, the volunteers became frustrated with the delay and for not making money during that time. This led to reduction of the workforce as the volunteers started missing the work in

pursuit of a side job. Interestingly, the strategy used to encourage the volunteers to return to the construction site and to once again engage in the self-help work, arose from female initiative when women decided to actively participate in the work and engage in the self-help work. At first, the participation of women was refused due to the arduous nature of construction work. However, once two elderly women came into the construction site and proved that they were able to do the job, more women felt inspired and enthusiastic with the idea of adding efforts in an attempt to accomplish the goal and move into the houses.

Budget and Resource Allocation

The Federal Savings Bank–CEF created a standard system of engineering procedures to serve as a nationwide reference for construction costs of housing and sewage and urban infrastructure. Accordingly, developers, NGOs, housing agencies, or groups interested in developing a housing project are supposed to submit a budget proposal based on the cost suggested by this system.

The National System of Construction Cost Index–SINAPI (*Sistema Nacional de Custos e Indices da Construção Civil*) is a monthly survey that reports the costs of construction materials, as well as the salaries of professionals in commercial establishments, industrial and construction unions in all state capitals. The Brazilian Institute of Geography and Statistics–IBGE (*Instituto Brasileiro de Geografia e Estatística*) and CEF are responsible for the official release of results, maintenance, and registration of technical references, calculation methods and quality control of data provided by SINAPI. The monthly report shows the cost of construction per m^2 and considers the price of materials, equipment, workforce and social charges.

Budgets found in documents such as technical reports, summary budget, and financial schedule showed that the construction costs included the price of construction wastes and brand new materials, expenses with hiring skilled labor and the provision of bus tickets and food baskets. Fifty percent of the price set by the SINAPI index was deducted from the value of the construction wastes. Overall, the government (represented by CEF) provided more than half of the total investment (53%), 30% came from construction waste, and the remaining 17% was funded by the host city (Figure 5-3). The total cost of constructing 30 housing units reached R$338,100.00 (USD $202,455.01), an average of R$11,270.00 (USD $6,748.51) and was allocated as listed in Table 5-3.

However, the total cost of construction as seen on Table 5-3 does not represent the final price of the houses built by the featured project. That is, the official budget submitted to CEF was supposed to show exactly how much it would cost to build 30 housing units of 40 m^2. However, the cost of items 3 (walls and panels), 4 (roofing), 5 (lining, decoration and painting), 6 flooring, and 7 (electricity and water) as seen on Table 5-3 represent the cost of brand new construction materials as suggested by SINAPI. Since the construction materials were reused and it was mentioned that 50% of the price set by the SINAPI index was deducted from the value of the construction wastes, the total cost of construction is R$218,524.00, (USD $130,852.70) an average of R$7,284.13 (USD $4,361.76).[13]

[13] Sum of items 3, 4, 5, 6, and 7 which represent construction materials / 2 minus total cost of construction / 30).

Cost Comparison of the Houses Built by the 'Where you Live' Program and the Federal Housing Program 'My House My Life'

Since 2009, the federal housing program 'My House my Life' has been the major housing program in Brazil and enables the construction of housing units to families whose income ranges from zero to three minimum wages, three to six minimum wages, and six to ten minimum wages. Families whose monthly earnings do not surpass three minimum wages are eligible for integral house loans and have ten years to pay the loan at a rate of 10% of their monthly income. Considering that the Brazilian monthly minimum wage in 2010 was R$510,00 (USD $305,38) the cost of the houses built by this program for the above mentioned income bracket ranges from R$6,120 (USD $3,664.68) to R$18,360 (USD $10,994.02). Families whose monthly income falls within the other two income brackets pay the loan at a rate of 20% of their monthly income plus interests.

Much alike the 'Where you Live' program, the municipalities hosting a housing project through the "My House my Life' program are required to donate the lot and to provide infrastructure services. Interestingly, only capital cities, metropolitan regions, and municipalities of over 100,000 inhabitants are eligible to host housing projects through the 'My Life my House' program. Alternative housing programs such as the 'Where you Live' program are important because reach countryside, small municipalities of 48,000 inhabitants such as Ibiporã.

The real cost of the housing units built by the 'Where you Live' program were slightly more expensive than the cheapest one built by the 'My House my Life' program. However, it is important to mention that participants of the program assessed in this study did not have to repay for the investment. Nonetheless, the beneficiary families

were requested to work voluntarily in the construction of the houses, which is somehow, a way of payment.

Survey Outcome

Most of the respondents (52.7%) were 30 to 49 years old (Figure 5-6A) and more than 90% were women (Figure 5-6B). Eighty five percent of the respondents were the head of the family or spouse (Figure 5-6C). Other respondents were relatives of the head of the family living in the house. Education level of respondents was poor. More than 92% had no education or did not finish middle school (Figure 5-6D). Only one respondent (7.1%) is originally from out of Paraná State (Figure 5-6E). Most of them came from Ibiporã and nearby cities in Paraná, such as Santa Cecília do Pavão, Londrina, Assaí, Primeiro de Maio, Nova Santa Bárbara and Rolândia. The majority of respondents were married (Figure 5-6F) and half of the houses had five or more people living in (Figure 5-6G). One of the units hosted ten people.

Most of the head of the family work in the private sector with construction work (Figure 5-7A and B). Besides, the income of these families ranges from one to two minimum wages. As a reflection of that, 57.1% of the families receive some financial support from the government (Figure 5-7C). All these supported families receive funds from the *Bolsa família* program.

When asked about the quality of the house, the worst rated parts of the house were the doors and roof (Figure 5-8A and D). Approximately, 78% and 64% of the residents said that the quality of doors and roof, respectively, was bad. (Figure 5-8A and D). Bathroom, room size and house size were well rated by 52.7, 71.4, and 71.4 % of the residents, respectively (Figure 5-8C, E and F). Quality of windows was rated as regular

by most of residents (Figure 5-8B). Only 14.2% of residents evaluated the number of rooms in the house as insufficient (Figure 5-8G).

The survey also revealed that, some basic polices of the program are not being followed. The houses were not supposed to be traded, but one third of the residents are not the original owner of the house (Figure 5-9A). Besides, half of the residents paid somebody to work in the construction to get the house (Figure 5-9B). Others simply purchased the house. The goal of the program was that the prospect owners would work themselves in the construction to deserve participating in the program.

Most of the residents have done some improvement on their house since they moved in (Figure 5-9C and Figure 5-5). Such improvements were mostly done by family members and neighbors (Figure 5-9D). Of the people that worked in the renovations, 57.1% told to have no experience with construction work (Figure 5-9E).

The safety perception of residents after moving to the houses was assessed as well. The majority of the residents (71.4 %) said the safety in the neighborhood has not changed after moving in (Figure 5-10A). Residents assessment on safety within the house boundaries tied. While 42.9% of the respondents have told that the safety within the house boundaries have increased, 42.9% reveled that safety within the house have decreased (Figure 5-10B). Moreover, safety in the community has increased for 78.6% of the residents (Figure 5-10C). Most importantly, over 85% of the residents had the pride and self-esteem increased after becoming homeowners (Figure 5-10D).

Table 5-1. Population attended (%) by water supply and sewage services in Brazil in 2000.

Location	Water supply	Sewage
Brazil	76.1	40.0
North	51.9	2.8
Northeast	63.9	17.7
Southeast	84.6	63.6
South	80.3	26.1
Paraná	82.5	31.4
Ibiporã	100.0	97.0
Midwest	77.9	33.1

Source: IBGE, 2000b. Table by author.

Table 5-2. Plan of work developed by the social work team

Project rationale	Goals	Methodology
Provide decent housing to the less fortunate while working on improving self-esteem and hygiene habits and increasing community participation and sense of place.	*Main Goal* To improve housing conditions of families living in extreme poverty and ensure the constitutional right to decent housing. *Additional Goals* To assist the community in terms of health, leisure, and education. To instill concepts of housing cleaning and maintenance to maintain a safe and pleasant living environment. To carry on informative meetings to discuss topics related to drug addiction and alcoholism.	The methodology applied attempts to foster community engagement in order to create an enthusiastic environment in the community and to ensure residents participation. The program was developed in phases: *Preliminary Phase*: poverty screening survey to assess families living in scarce housing conditions. *Mobilization Phase*: discussions and meetings with the selected families to explain the criteria of participation as well as to stress the importance of participation during demolition and construction processes. *Monitoring Phase*: support the families in need of extra assistance to meet basic living needs as well as provide guidelines for the workers in the construction site. *Moving Phase*: organize the families to occupy the units. *Evaluation Phase*: carry on individual surveys to assess user's satisfaction in relation to the house and to the program.

Source: Based on a document entitled 'project of social work', provided by the Department of Social Work in Ibiporã. Table by atuthor.

Table 5-3. Costs of the construction of the houses featured in this study.

Description	Total cost (R$)[a]	(%)
1. Preliminary work		
Licensing and tax	2,730.00	
Food baskets	8,700.00	
Total cost of item	11,430.00	3.38
2. Infrastructure		
Site cleaning	15,334.20	
Other site preparation services	59,541.80	
Total cost of item	74,876.03	22.15
3. Walls and panels		
Bricks	35,785.86	
Steel windows and doors	17,963.40	
Wood doors	10,224.90	
Hardware	3,060.00	
Glass	4,492.80	
Total cost of item	71,526.96	21.15
4. Roofing	47,315.71	
Total cost of item	47,315.71	13.99
5. Lining , decoration and painting		
Internal lining material	36,142.20	
External lining material	6,130.29	
Painting	6,598.56	
Total cost of item	48,871.05	14,45
6. Flooring		
Cemented floor	13,112.28	
Total cost of item	13,112.28	3.88
7. Electricity and water		
Electrical wiring	25,416.30	
Water piping	9,543.60	
Sewage and stormwater	13,059.00	
Bathroom, kitchen and laundry	10,308.00	
Total cost of item	58,326.90	17.24
8. Complementary services		
Site cleaning	1,166.04	
Transportation	7,425.00	
Bus fare	4,050,00	
Total cost of item	12,641.04	3.76
Total cost of construction	338,100.00	100.00

Source: Information gathered through analysis of archival records at the Department of Social Work in Ibiporã and at CEF. Table by author.
[a] R$1.00 = USD $0.601 (13.02.2011).

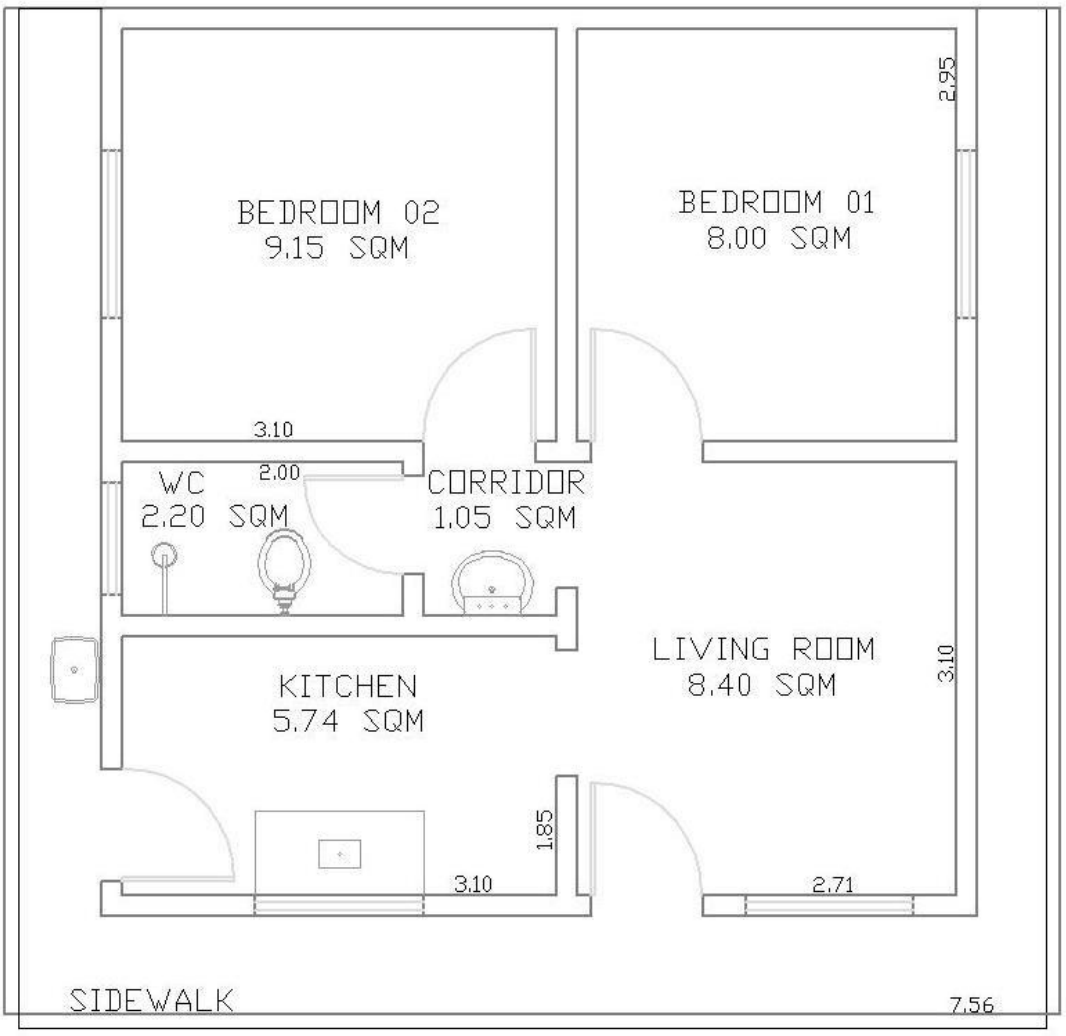

Figure 5-1. Architectural design of the housing unit featured in this study.

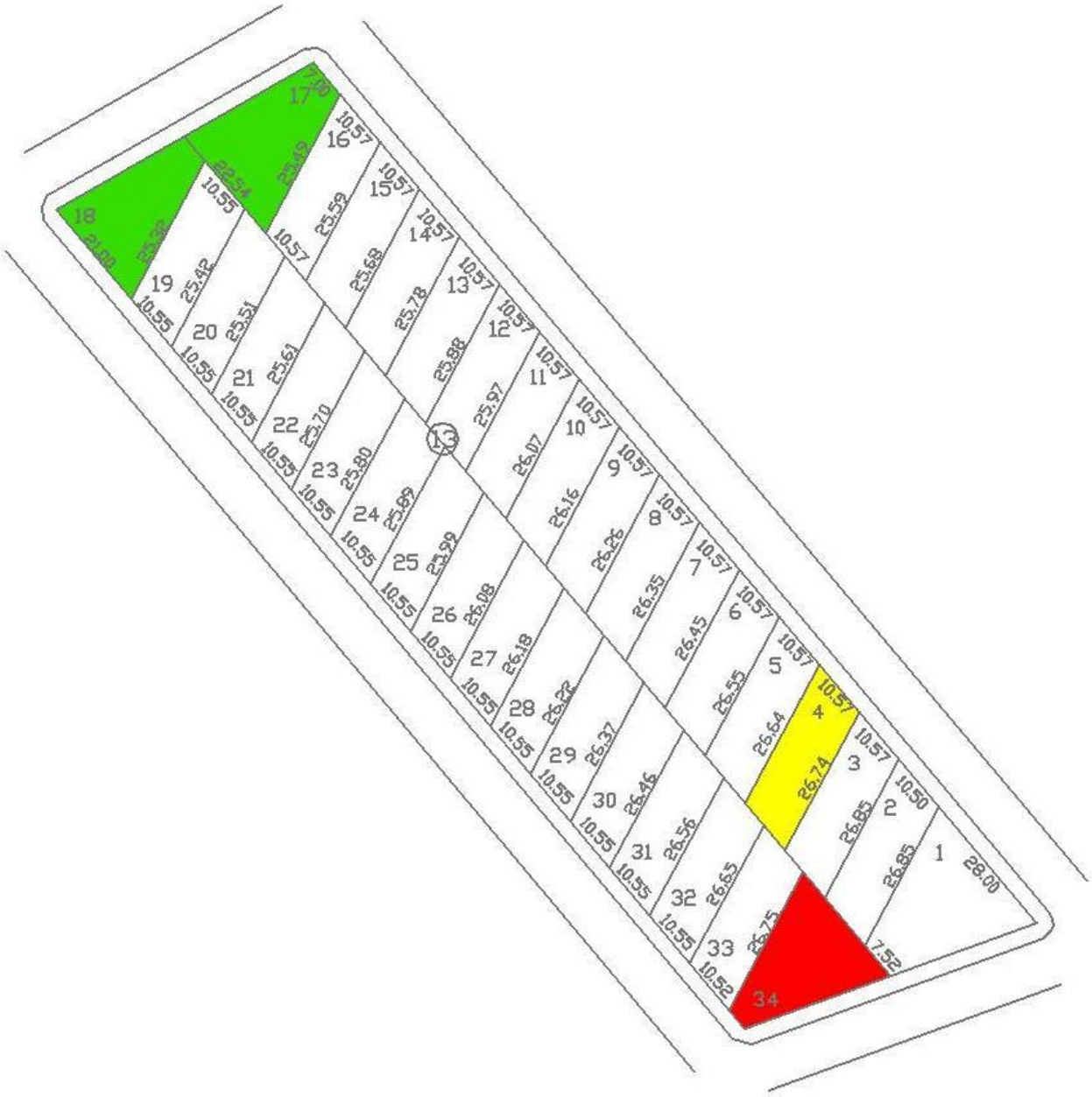

Figure 5-2. Arrangement of parcels in the area where the houses featured in this study were built. Parcel 4 in yellow is vacant, parcels 17 and 18 in green are planned to host a plaza, and parcel 34 in red is improper for housing construction.

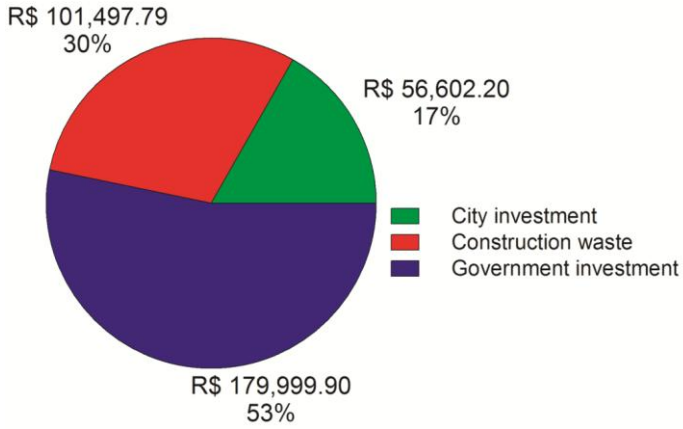

Figure 5-3. Source of funding used for the construction of the houses featured in this study. Source: Information gathered through analysis of archival records in the Department of Social Work in Ibiporã and at CEF. Graph by author.

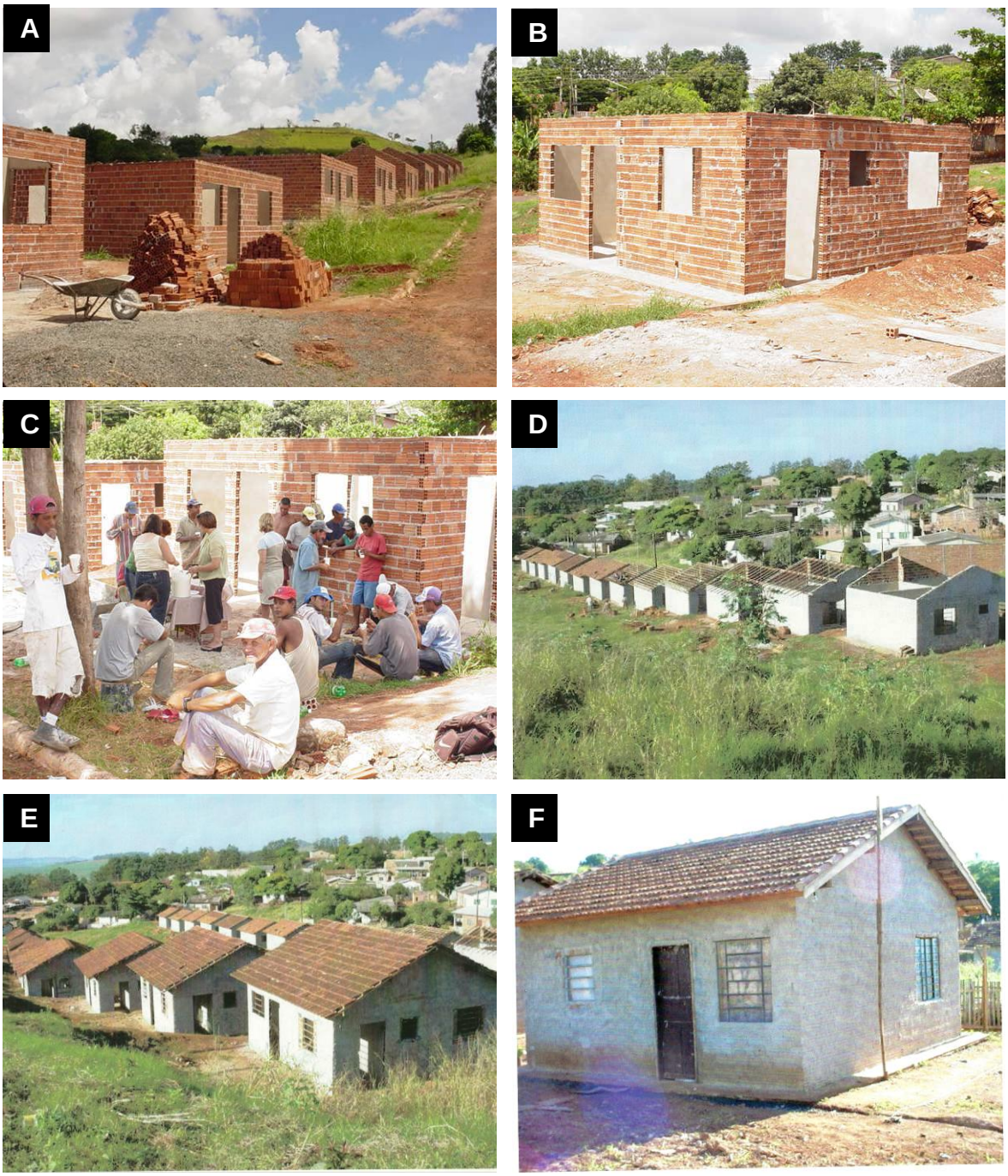

Figure 5-4. Progress of the construction work in ‘Hope Village’. A) and B) early stages of the construction, C) self-help workers at the construction site, D) and E) overall view of the village under construction, and F) finished house. Source: Pictures courtesy of the Department of Social Work of Ibiporã.

Figure 5-5. Improvements in the houses of ‘Hope Village’. A) House with front door transferred to the side, B) house that has been painted and had the windows replaced, C) house that has been painted, fenced and expanded, E) and F) units that have undergone radical change in comparison to the original design. Source: Pictures by author.

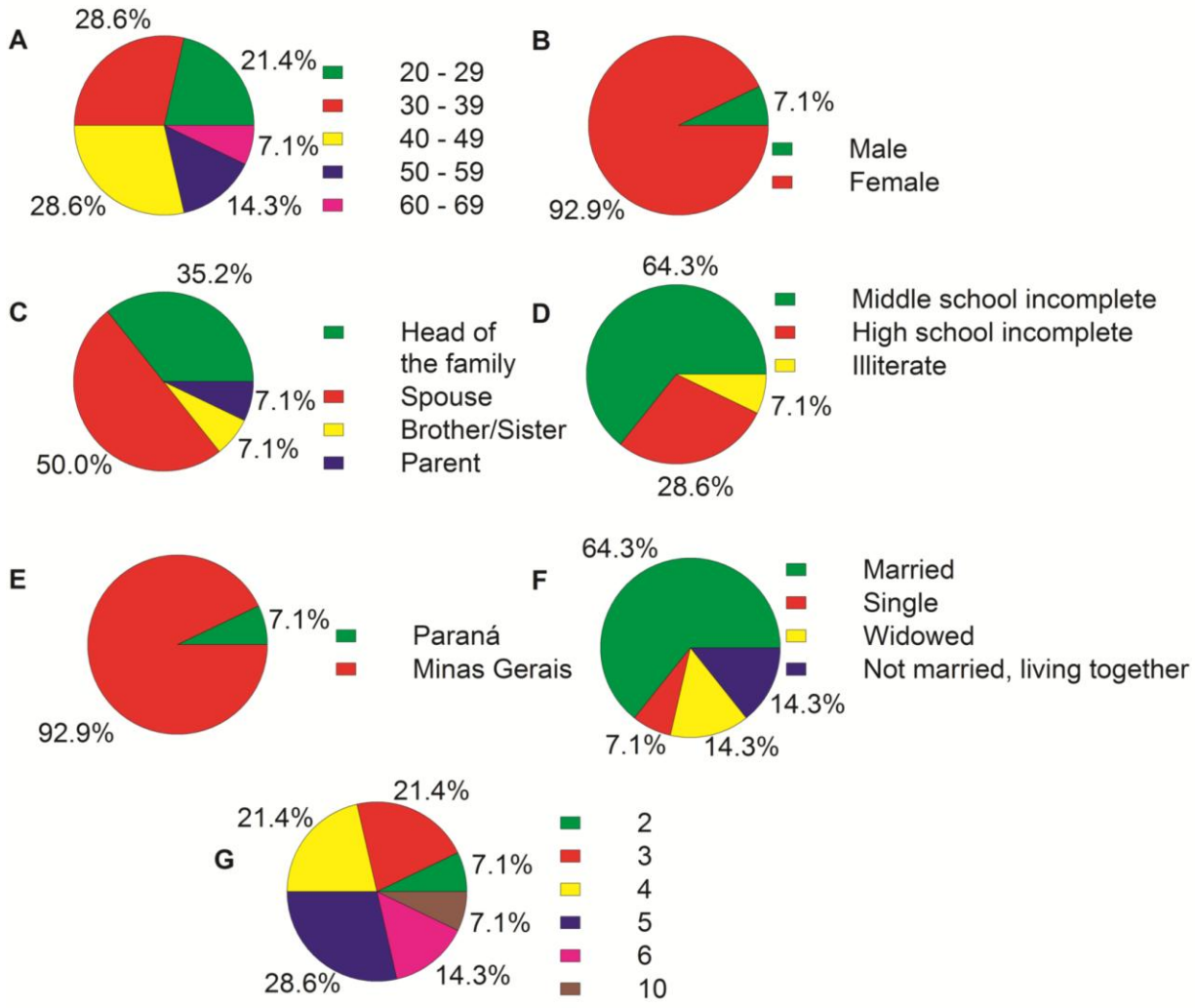

Figure 5-6. Social and economic profile of residents of the houses featured in this study. A) Respondent age in years, B) respondent gender, C) relationship of the respondent with the head of the family, D) education of respondent, E) state of origin of respondent, F) marital status of the respondent, and G) number of people living in the house. Data based on 14 out of 30 housing units.

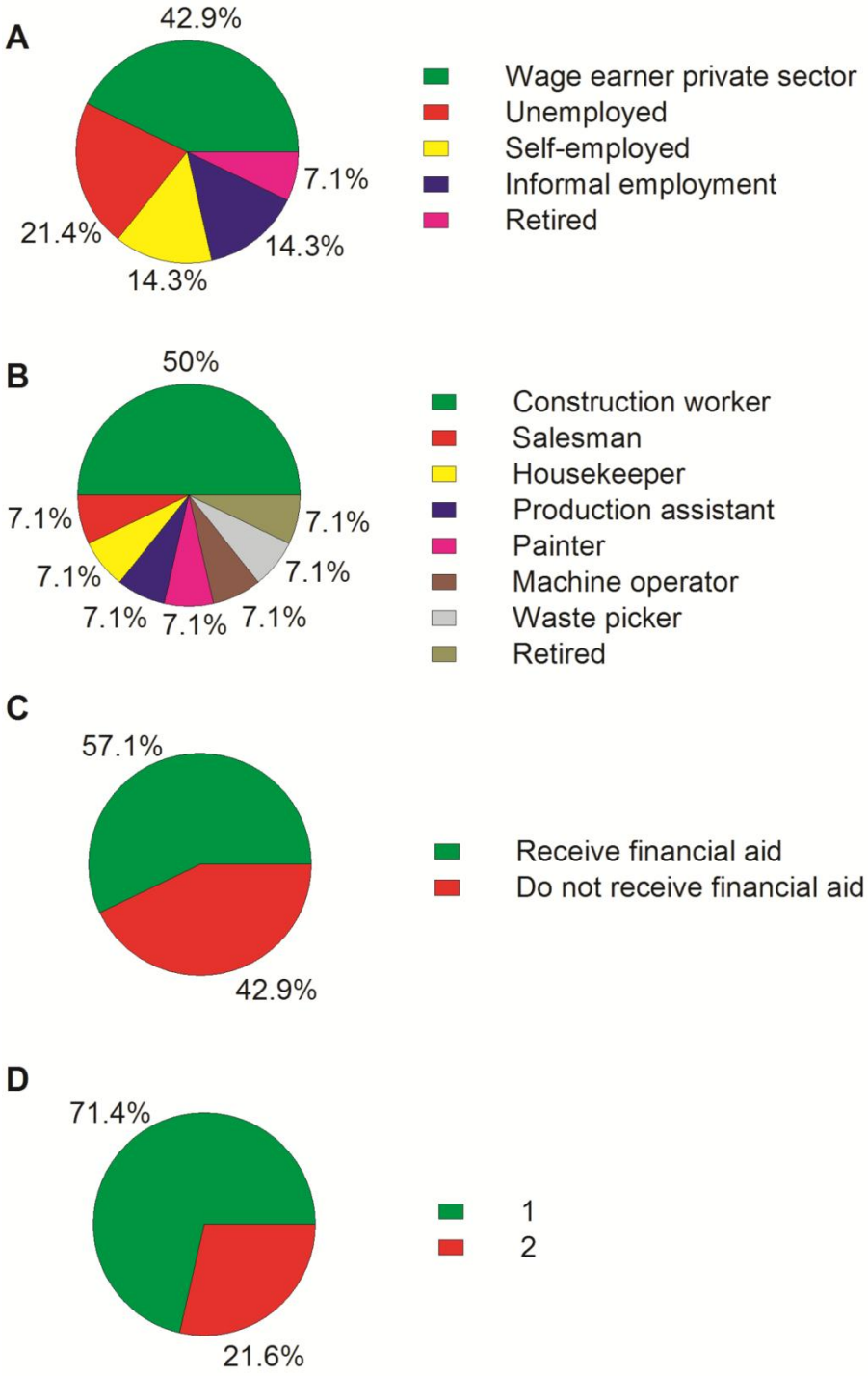

Figure 5-7. Employment and income of residents of the houses featured in this study. A) Type of employment of the head the family, B) head of the family occupation, C) families that receive financial aid from the government, and D) monthly income of the head of the family in minimum wage (1 minimum wage = R$510,00 or USD $305,38). Data based on 14 out of 30 housing units.

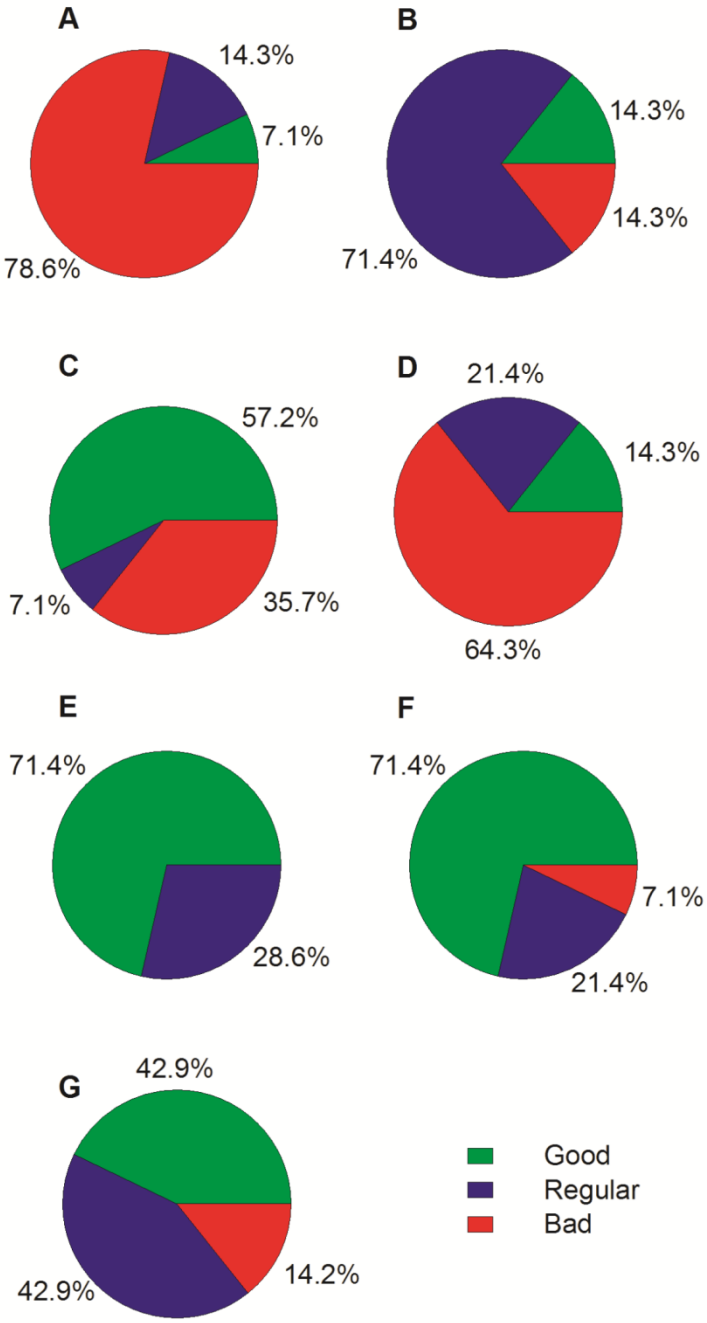

Figure 5-8. Residents assessment on the quality of the houses featured in this study. A) Door, B) window, C) bathroom, D) roof, E) room size, F) house size, and G) number of rooms. Data based on 14 out of 30 housing units.

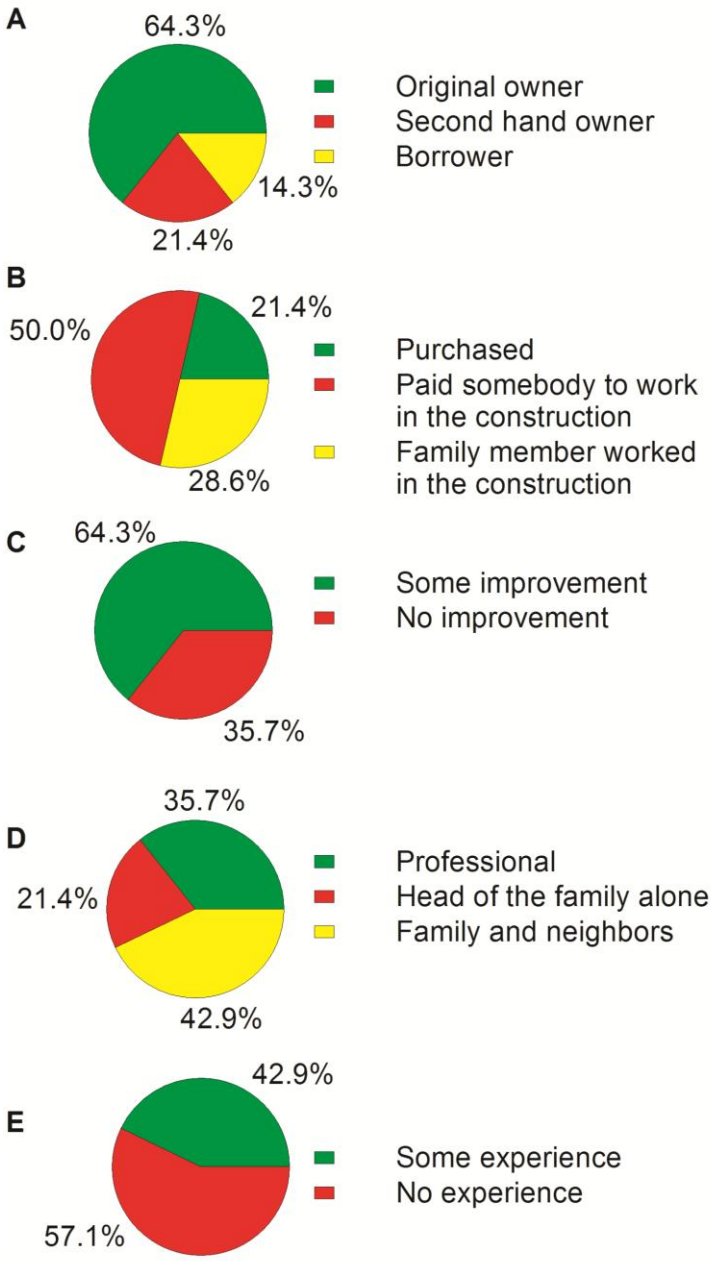

Figure 5-9. Ownership status and improvements made in the houses featured in this study. A) House ownership, B) means used to acquire the house, C) residents that have done some improvement since the construction of the house, D) skilled labor hired or to be hired for the renovations, including finished and planed renovations, E) construction experience of the person who worked in the construction site. Data based on 14 out of 30 housing units.

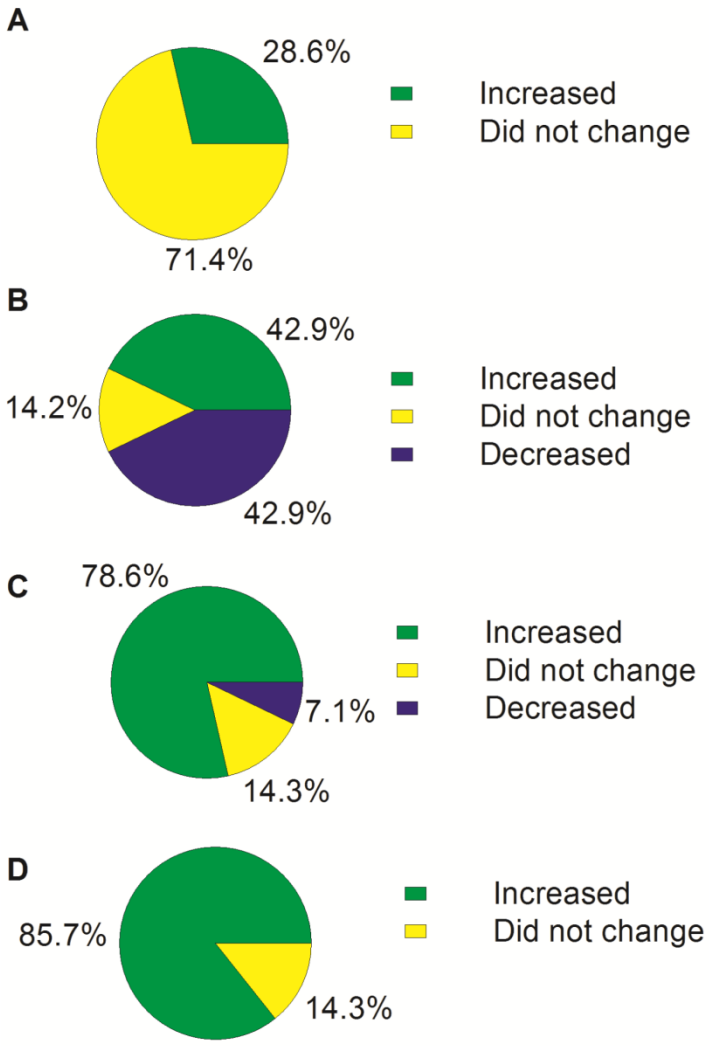

Figure 5-10. Safety perception by residents of the houses featured in this study. A) In the neighborhood, B) within the house boundaries, C) in the community, and D) residents pride and self-esteem change after becoming homeowners. Data based on 14 out of 30 housing units.

CHAPTER 6
CONCLUSION

Residents Perspectives

The majority of respondents were either the spouse of the head of the family or the head of the family himself, adults at ages ranging from 20 to 49 years, women, and married. Education among respondents was precarious. More than a half did not finish middle school, and a few quitted at high school. All respondents, except one, were originally from Paraná State. The number of people living in each house was variable and revealed that most of the houses are occupied by nuclear families with kids in school age. One unit housed two families (ten people) and one family was composed of a couple, only.

Job conditions improved in comparison to the period when they moved into the houses. That is, one of the criteria of the program was that participants could not have a formal income. Currently, almost half of respondents are wage earners employed at the private sector, but the vast majority still earns as little as one minimum wage and more than a half relies upon aid assistance from the government. Half of the respondents are engaged in construction work.

When asked about the quality of the house, the majority of respondents rated doors and roofs as bad, windows as regular, bathroom, room size, and house size as good, and number of rooms equally as good and regular. Several respondents were extremely upset with the quality of the roof. Some complained about the fact that not all donated clay tiles had the same measures and that those materials were old, which in turn resulted in rainwater dripping. Some said that if their financial situation allowed, they would replace the roof. Further, lots of respondents complained about the quality of

the doors. They mentioned that the doors installed inside the house were good, but felt insecure about the front door. Those who could afford simply replaced it by a brand new, safer one, and those who still had the original door used a metal chain and a lock.

Respondents were satisfied with the size of rooms and the overall size of the house. The housing program 'My House my Life' builds 35 m^2 large houses to households that make less than three minimum wages monthly. Nevertheless the houses built in Ibiporã are larger, with 40 m^2. Besides, the lot size allows expansion of the house and outreaches what is expected in the legislation (Kalil, 2004, citing Moretti, 1997). The lots are 261.25 m^2 large and the legislation requires a minimum of 125 m^2.

"Housing affordability is most commonly understood as the extent to which a household's income can cover the purchase price of a home" (Center for Transit-Oriented Development and Center for Neighborhood Technology, 2006, p. 1). If taken into consideration the literal meaning of this sentence, one may say that the housing project implemented in Ibiporã was unquestionably affordable given that recipients did not have to pay for the houses. However, by saying so, one may undermine the means used by the recipients to deserve the house.

It is true that in the case study assessed, half of the recipients did not follow some basic rules of the program – that of providing one volunteer to work in the construction – and end up being free riders. Recipients that benefit from the provision of public goods without making a payment or without sharing responsibilities with the provider is a common issue of public policies in the welfare area (Gramlich, 1987). Free riders know that one cannot be excluded from the benefits of public goods, regardless of whether one has contributed to it or not. Because public goods do not exclude

nonpayer, some have argued that free riders are unlikely to make voluntary payments or to cooperate (Gramlich, 1987). In other words, the way governments handle public goods gives nonpayer an incentive to not cooperate.

"Joint utility maximization can be achieved by the cooperation of interest parties in some activity" (Gramlich, 1987, p. 417). Governments are committed to provide assistance in an altruistic way, but the individual behavior of free riders recipients does not produce efficient results (Gramlich, 1987). Ideally, arrangements between givers and receivers of public goods should be established and followed by both parties in order to increase cooperation. However, although the case study assessed established arrangements between recipients and providers, the agreement was not respected for all participants. Gramlich (1987) "calls for a reexamination of the public welfare system" (p. 417) and suggests that since voluntary provision of public goods do not work, government should make the provision involuntary to prevent individuals from being free riders. This in turn, could contribute to increase the participation of needy and worthy recipients and simplify the selection process since only people willing and able to share the responsibilities with the providers would sign up for the task.

The participation of residents in the construction was unsatisfactory and residents assessment on the construction process (self-help) revealed some disappointment. Four respondents believed that the delay in delivering the houses was due to the lack of commitment from the residents and lack of punishing measures from the social work team. More specifically, respondents revealed that although all the selected participants were indeed promised a house, not all participants deserved it. Besides, they mentioned that the social work team did not know how to handle this situation which became worse

as the construction did not progress as planned. During the final stages, mostly women were engaged in the construction site and a few volunteers that worked since the beginning. Moreover, one of the respondents argued that the process of assembling volunteers, teaching basic skills, and assigning tasks happened only once. This in turn, had a negative impact on the learning process and discouraged the volunteers that remained at the construction site. Clearly, the process of teaching basic building skills should have been more carefully planned given that more than a half of the volunteers had no previous experience with construction work.

Five satisfied respondents said that the self-help process was a good experience and that all means were valid to achieve homeownership and to be set free from rental expenses. On the other hand, two unhappy respondents regretted having participated in the project and wished they could afford moving someplace else even if that meant going back to rent. These two households were especially upset with the quality of the houses because they have the house flooded due to rainwater run-off and lost part of the furniture. In fact, nine respondents revealed that since the day they moved into the houses, rainwater run-off has flooded their houses occasionally. Yet, it was unanimous among respondents that the damages caused by the rainwater flood were worse in these two houses mentioned.

Households that have problem with flooding handled the situation by transferring the entrance door from the front of the house to the side, facing the next door neighbor (Figure 5-5A). Another change often observed was the swap of the functionality of some rooms in the house. In some units, the smaller bedroom (8.0 m^2) was being used as the kitchen, since that bedroom was larger than the original kitchen (5.7 m^2). Respondents

also revealed that if given the chance to opt, they would have asked for a bigger kitchen.

The house trading was another fact that frustrated the respondents. Although participants knew that the Federal Savings Bank–CEF strictly prohibited selling these houses, a few respondents were not the original owner. Houses built though housing programs financed by the federal government, cannot be sold in less than ten years after moving in. In case a household needs to move out during this probation period, the household is supposed to communicate the project team so the house can be returned and transferred to other applicants. It has been estimated that the selling price of the houses ranges from R$11,000 to R$18,000 (USD $6,580 to USD $10,770).

When asked about how respondents planned to accomplish housing improvements, the majority revealed they were firstly to rely on help from relatives and neighbors, secondly on hired skilled labor and lastly on their own efforts. However, the respondents did not know how much they have spent with renovations or how much they will spend to accomplish housing improvements. Housing improvements planned by the residents included a patio, floor tile, new doors and roof, and plastered, painted walls. All residents demonstrated will to fence the lot. Only one respondent intended to add two extra bedrooms to the house. This contrasts with what Patrick Geddes stated when wrote “that the essential need of a house is room and that the essential improvement of a house and family is more room” (Turner, 1967, p. 167, citing Patrick Geddes).

Safety perception and change in self-esteem were also assessed. Safety within the neighborhood did not change, whereas security within the community increased.

There was not a consensus between respondents safety perception within the house. In fact, half of respondents felt insecure. Respondents that felt unsafe did not complain about any threat of burglary within the community, but revealed their fear of drug dealers and thefts in the surrounding areas. Besides, respondents that said security within the house boundaries decreased revealed desire to fence the lot.

As previously mentioned in Chapter 5, the region was already furnished with urban infrastructure and access to the city center is easy (three kilometers). However, housing is far more complex than location and access to urban infrastructure.

> As home, housing is the primary setting for family and domestic life, a place of refuge and relaxation from the routines of work and school, a private space. It is also loaded with symbolic value, as a marker of status and an expression of style. Housing is also valued for its location, for the access it provides to schools, parks, transportation, and shopping. (Schwartz, 2006, p. 2)

Thus, assessments on how households feel in relation to housing should represent a combination of aspects ranging from safety, location, accessibility, transportation, well-being, among others elements that are meaningful to each household. In other words, housing and city development are bounded and planners must plan “spatially integrated cities that meets the needs of society” (Beauregard, 2003, p. 114).The challenge for planners has become even greater and audacious. In the earlier years of the profession, the task was to regulate spatial arrangements of land uses and to provide housing. Currently, the challenge is focused on a “comprehensive planning that articulates the organic integrity of the city” (Beauregard, 2003, p. 115) and on the necessity to plan the city for the welfare of the distinct classes, including the minorities and low-income population.

Final Considerations

Residents assessment on the construction process revealed frustration and disappointment. Residents were not allowed to express opinions, did not have the chance to contribute during planning process, yet their participation was requested to complement the building work managed by skilled labor. However, “it is an error to think that participation in housing is synonymous with self-help construction” (Turner, 1976, p. 140). In fact, the housing project assessed in this study has characteristics of what Turner (1976) calls “sponsors decide and users provide”. That is, “the sponsor selects the site, plans the dwellings, and arranges the financing and administrative procedures before selecting the participants” (p. 141). In democratic systems, users decide and sponsors provide or users decide and users provide (Turner, 1976). Participants in the case study assessed were passive contributors to the implementation of the sponsor’s project. Therefore, one may conclude that the housing project carried out in Ibiporã was undemocratic.

Not different from what was observed in Ibiporã, women are majority in projects of self-help construction and develop exactly the same tasks delegated to the men (Kalil, 2004). Likewise, an assessment of the FUNACOM housing program implemented in São Paulo city from 1989 to 1992, reveals that “the majority of women, like a considerable number of the men, had never done any building work before and did not have the required skills. Nevertheless, they learned from each other and by training” (Denaldi, 1997, p. 222). While, in the FUNACOM program women participation in the construction site was purposely planned and welcomed, in Ibiporã, women were allowed to participate only when almost all men had given up on the work and the

sponsors of the project realized that women's help was needed in order to finish the construction.

The survey presented in Chapter 5 assessing respondent's plans to accomplish housing improvements (Figure 5-9 D), are somewhat compatible with the results of the research carried out in the city of Pereira, Colombia (Gough, 1996). This research investigated how the principal actor is involved in the construction of houses and revealed that the majority of respondents either hired some type of skilled labor and helped alongside or relied on help from relatives and friends. Only a small number of respondents worked by themselves or relied exclusively on skilled labor. However, it is important to note that households may carry out construction work in a variety of ways and may combine sources of workforce all at once. For example, "it may involve total dependence upon hired labor and a contractor may be employed with his own team of laborers" (Gough, 1996, p. 640, citing Ward, 1982, p. 200).

Organizing community members to engage in self-help construction is not an easy task and the "difficulties stem from the heterogeneous nature of self-help households" (Gough, 1996, p. 647). In the case study assessed, the lack of participation of residents in the construction process revealed that procedures adopted by the sponsor team, represented by the department of social work, were inefficient. This statement is mostly based on the fact that the plan of work developed by the social work (Table 5-2) team considers engaging on unrealistic goals and methods which do not supply the needs of self-help projects. For example, discussing drug addiction and alcoholism as well as providing concepts of housing cleaning and maintenance are inconsistent with the nature of the construction. However, the social work project did consider community

engagement as a means to create an enthusiastic environment in the community and ensure participation. Organizing a community to work on self-help construction demands that professionals are familiar with special techniques and abilities for stimulating the desire to learn a new working skill, for stimulating commitment to themselves and to the whole community. The success of self-help projects depend upon solidarity, understanding and cooperation (Kalil, 2004, Denaldi, 1997).

The construction work initiated on July 2004 was finished on November 2005. The project was scheduled to be finished in six months, but ended up spending ten additional months to deliver the houses. Denaldi 1997, lists some essential rules to be defined among self-help builders to avoid delay: (i) “the hours that each household should work on the site monthly or weekly, (ii) rules on what should be done when workers cannot work as per the agreement, (iii) disciplinary sanctions in which families can be excluded, (iv) which members work in which specific units” (p. 218–219). The housing project evaluated did not define any of these rules, but the social work team cannot be blamed for the delay in delivering the houses, in fact the social work team cannot be held responsible for the failures alone. Firstly, “many attempts to co-ordinate households in collective construction flounder because they are, in effect, trying to regularize what is, by its very nature, an individual process” (Gough, 1996, p. 647). Secondly, it seems that all responsibilities related to instructing and guiding the participants in the construction site were delegated only to the social work team. Engineers and architects participated from their offices. When contacted to supply information for the present study, these professionals responded that their job was limited to find a site in conformity with the guidelines set by the Federal Savings Bank–

CEF, elaborate the design plan, and prepare the infrastructure needed in each individual parcel such as water and sewage systems. Besides, accomplishing the duties delegated to engineers and architects did not rely on the work done by another team and interacting with the volunteers was not necessary. While UN-HABITAT (2003) calls for inclusive planning systems and multi-disciplinary approach to planning, interaction among professionals was low and the interaction of participants and technicians was weak.

The connection between construction waste and housing affordability is not as simple as originally hypothesized. As explained in Chapter 5, 50% of the purchase price of brand new materials suggested by the National System of Construction Cost Index–SINAPI was deducted from the value of the construction wastes. Construction wastes represent half of the purchase cost of brand new materials. Thus, the investment in the purchase of construction materials was 50% less than if brand new materials would have been bought. Also, unpaid labor contributed to boost affordability and self-help work is justified for providing a beneficial outcome for the worker, a home. The output of the efforts produced by unpaid workers while engaged in the construction is the house. However, if participants were not required to engage in unpaid work, they could have made informal working arrangements, which would have yielded hourly wage rates based on paid working time. Construction waste provided the means to lower the total building cost, but the cost-effectiveness between the quality of the materials and the final product is a blurry relationship.

When assessing the economic efficiency of public policies, the support from technicians and transaction costs are not usually taken into account. Often, the support

from professionals involved in the planning, development, and evaluation of public policies and programs as well as transaction costs, and support provided by agencies (public, non-governmental or private) are not included in the budget. However, these hidden costs should be considered simply because public policies and public programs cannot be implemented without the strong support of technicians and agencies.

The majority of respondents complained about the quality of doors, roof and windows, and mentioned that if given the chance, they would replace for brand new ones. A few respondents also mentioned that they believed that the quality of the houses would have been better if the building materials used were brand new. In general, respondents were satisfied not with the quality of the houses, but with the fact that they are homeowners and do not have to worry about rental expenses or moving out. Most importantly, the majority of the respondents were thankful for not having to pay back the investment granted to them and hoped to improve housing conditions progressively.

The housing project assessed was not flexible and did not allow public participation apart from that of construction work. Arnstein (1971) calls the attention to the euphemisms and exacerbated rhetoric present around the discussion: citizen participation and citizen power. Even scholars have found it difficult to follow the controversy—citizen participation or maximum feasible participation, where "participation without redistribution of power is an empty and frustrating process for the powerless" (Arnstein, 1971, p. 2). Advocates of community participation suggest that nobody should be against it because participation triggers democracy, an idea unanimously accepted among stakeholders and individuals in general. While public

participation seems like it is wholly beneficial, there are also some negative aspects as well, as can be the case when so many voices are heard and a decision cannot be made. For example, one of the constraints listed by the FUNACOM housing program—a true flexible and democratic approach—relates to the fact that in so many occasions residents opinion would conflict with that of policy-makers and divergences between community members would hamper decision-making process (Denaldi, 1997).

Influenced by the work of John Turner, self-help housing has long been considered the most feasible alternative to house the poor (Berner, 2001). Researchers such as Fernandes (2002, 2007), Durand, Fernandes, Payne & Smolka (2002), and Berner (2001) argued that when it comes to housing provision the government should provide legal means to increase security of tenure. These researchers share a viewpoint well stated by Turner (1967), when he said that "given the right circumstances—that is, adequately located, properly planned, and with secure title—experience has shown that development to contemporary standards will securely take place, even if slowly" (p. 168). Nevertheless, government sponsored projects in partnerships with NGOs have been gaining popularity among researchers and delivering positive results. Sponsored projects are still a useful way of housing the poor because some households simply do not have the means to afford any type of housing improvements, which was the exact case of a few respondents surveyed. Naturally, some respondents have been thriving economically and achieving financial stability and therefore can afford housing improvements. In a nutshell, one's ability to improve housing conditions is a very particular and heterogeneous characteristic of individuals.

What has been argued here is that governments should not leave the poor to their own fate and expect that they will house themselves.

Non-governmental and private organizations “should be able to launch local projects that are small in scale, politically independent, low cost, and innovative” (Annis, 1987, p. 129). In an attempt to answer whether small scale programs could be widely replicated, Annis (1987) states that replicability depends on political will and public policy. In Brazil, since the launching of the federal housing program ‘My House my Life’, the national housing policy has been pushing municipalities to implement housing projects capable of reaching the demand in general instead of developing isolated initiatives and small scale programs. Municipalities have been guided by the National Housing Policy to provide consistency and uniformity while planning the local plans (Sandra Cordeiro, personal communication, January 25, 2011).

However, much has been discussed about the issues related to “one size fits all” type of programs. As previously mentioned, housing choices are not uniform and housing policies should fit the segments of target groups. In a field such as housing, diversity should always be welcomed and new alternatives should be put into practice to assess whether replicability is viable or not; it depends on the local context of each municipality.

While the housing program assessed on this study did not achieve results capable of solving the housing deficit, alternative and innovative small scale programs are important complements of the national housing policy. Municipalities with less than 100,000 inhabitants benefit from housing projects through small scale programs such as the one featured in this study. Moreover, testing whether replicability is appropriate is a

way to ensure that successful initiatives will be repeatedly implemented in places when it is convenient.

The case study assessed in this study combined new alternatives for housing the poor. This housing project followed some consensual rules displayed in the literature, clarified a few concepts, overcame constraints, but ultimately, delivered affordable housing units. After all, the hard work was paid off and participants were thankful for not having to pay back the investment granted to them.

Opportunities for Further Research

The current study could be taken into a new direction by narrowing the analysis of the features of construction waste materials to assess quality control and cost-effectiveness. Further studies should count on engineering expertise and expand the scope of analyses to assess the advantages and disadvantages, strengths and constraints of recovery, recycling and reuse of construction waste.

This study did not attempt to compare cost-effectiveness of housing projects managed by public agencies and non-governmental organizations. Conversely, this study focused on assessing a project developed through public-non-governmental partnership, thus there is room for comparative studies.

APPENDIX
INFORMED CONSENT APPROVED BY THE INSTITUTIONAL REVIEW BOARD AND QUESTIONNAIRE PRESENTED FOR RESIDENTS SURVEY

Informed Consent

Protocol Title: Research on non-conventional finance for self-help housing in the Metropolitan Region of Londrina, Brazil.

PLEASE READ THIS CONSENT DOCUMENT BEFORE YOU DECIDE TO PARTICIPATE IN THIS STUDY.

This study is being conducted by Lidiane A. Viana Behlau, a graduate student at the University of Florida (UF), and thesis advisor is Dr. Andres Blanco, a faculty member at UF.

Purpose of the research study: The purpose for this research is to gain insights on how alternative ways to provide affordable housing other than the options provided by officially sponsored projects suggested by public housing institutions can contribute to increase the production of affordable housing.

What you will be asked to do in the study: All consenting participants will be asked to complete a survey immediately after signing this informed consent.

Time required: Approximately 40 minutes.

Risks and Benefits: No risks are associated with completing this survey. There are no personal direct benefits. Indirect benefits include helping advance research at UF.

Compensation: Participants will not be compensated for filling out the survey.

Confidentiality: Your identity will remain confidential. After all responses have been reviewed and tabulated, your information will be kept in password-protected files and your identity will not be linked to your responses. All identity links will be removed from your responses.

Voluntary participation: All participation in this study is voluntary. There is no future obligation to this study. You do not have to answer any questions you do not wish to answer.

Right to withdraw from the study: You may withdraw from the study at anytime without consequence.

Results: the results of this survey will be tabulated and findings will be published as part of a thesis research project.

If you have questions about the study, please contact: Lidiane A. Viana Behlau, Rua Maria Benedita de Jesus, 239, Rancharia-SP, (18)3942-1165, libehlau@ufl.edu or Dr. Andres Blanco, Assistant Professor, Urban and Regional Planning, University of Florida, P.O. Box 115706 Gainesville, FL, USA 32611-5706, (352) 352-392-0997 ext. 223, agblanco@ufl.edu.

If you have any questions about your rights as a research participant in the study; please contact: UFIRB Office, P.O. Box 112250, University of Florida, Gainesville, FL 32611-2250; Tel: (352) 392-0433.

Agreement: By signing this form and completing this survey, I attest that I have read the procedure described above. I have been offered a copy of this informed consent form for my own records and I voluntarily agree to participate in the survey.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

Approved by
University of Florida
Institutional Review Board 02
Protocol # 2010-U-0564
For Use Through 07-16-2011

1. Identification

Gender: ( ) male ( ) female
Age: _____
Residential address: _____
City: _____
Birth City: _____
How long have you been living here ( ) 1-3 years ( ) 4-6 years ( ) up to 7 years
What is the relationship between you and the head of family:_____

2. Education

( ) Middle School Incomplete ( ) Middle School Complete
( ) High School Incomplete ( ) High School Complete
( ) College Incomplete ( ) College Complete
( ) Illiterate

3. Occupation

( ) Wage Earner Public Sector ( ) Wage Earner Private Sector
( ) Self-Employed ( ) Informal Work
( ) Retired ( ) Unemployed

4. Job Position:_____

Income
( ) 1 MW ( ) 2 MW ( ) 3 MW ( ) 4 MW ( ) ≥ 5 MW

Head of the household:
( ) Husband ( ) Wife ( ) Relative ( ) Son/Daughter ( ) Other

Does anybody in this household receive income from a cash transfer program:
( ) Yes ( ) No
If so, which one, and how much: _____

5. Marrital Status

( ) Single ( ) Married
( ) Not married, living together ( ) Separated
( ) Divorced ( ) Widowed

6. Housing Situation

Number of families per household: _____
Number of people living in the household: _____
Are you the original resident or you bought it from someone else:_____

Ownership Status:
( ) Own ( ) Rent ( ) Lend

Did you do any type of renovation/improvement in the house after the intervention:
_____

Do you plan on improving the housing unit: _____; if so, what would you improve:
_____

How will you accomplish this:
( ) hire skilled labor ( ) Help from neighbors/relatives ( ) Do it yourself ( ) Other

How much money do you anticipate spending in the improvements:_____

7. Quality of Housing Units

Door	( ) Good	( ) Regular	( ) Bad
Windown	( ) Good	( ) Regular	( ) Bad
Bathroom	( ) Good	( ) Regular	( ) Bad
Roof	( ) Good	( ) Regular	( ) Bad
Size of the rooms	( ) Good	( ) Regular	( ) Bad
Size of the House	( ) Good	( ) Regular	( ) Bad
Number of Rooms	( ) Good	( ) Regular	( ) Bad

8. Experience from Participating in the Project

When did you get the house:_____

How long did it take to get the house built: _____

What were you required to do in order to get the house:_____

Did any member of this household participated in the construction of the house:
( ) Yes ( ) No

If so, did the person have any previous experience working in construction or any type of building skills:
( ) Yes ( ) No

Please, tell about the overall experience of participating in the program:
_____
_____
_____
_____

How do you compare your current housing situation to that of before participating in the project:_____
_____
_____
_____

What has changed in your community and in your household after the intervention:

Security in the household	( ) increased	( ) decreased	( ) stayed the same
Security in the community	( ) increased	( ) decreased	( ) stayed the same
Security in the neighborhood	( ) increased	( ) decreased	( ) stayed the same
Pride and self-esteem	( ) increased	( ) decreased	( ) stayed the same

Do you feel like the quality of your house would be better if the materials were not recycled:

_____

Do you have any complain about the house or about how the project developed:

_____

If so, please describe:

_____
_____

Observations:_____
_____
_____
_____
_____

Date: _____/_____/_____

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BIOGRAPHICAL SKETCH

Lidiane A. Viana Behlau was born in Rancharia, São Paulo State, Brazil, in 1985. From 2003 to 2005, she attended the State University of Londrina, located in Paraná State–Brazil, where she earned a bachelor's degree in social work. During this time, she was involved in public housing activities at the Housing Company of Londrina (COHAB-LD), where she worked as an intern throughout her undergraduate studies. The internship work was within the Department of Affordable Housing. In February 2006, she moved to the U.S. with her husband, who was pursuing his Ph.D. degree at the University of Florida. In August 2008, she was admitted into the master's program in the Department of Urban and Regional Planning at UF, where she had the opportunity to explore planning resources and strategies to address the issues that arise from the need for affordable housing. She expects to continue exploring alternative ways to enhance housing affordability, to provide decent housing for low-income households and create measures and policies to house the poor around Brazilian cities.