Giving More to the Poor, a Successful Brazilian Housing Program Analysis

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Abstract

The affordable housing program, My House, My Life (MHML), provided an output of 3 million affordable houses for the poor population in 4 years which represents more units built then in 20 years. Special financing and social conditions were used is such a way that a poor income family could buy a house paying only 5% of its value. Topics as: more for the poor, financial criteria, social criteria, specifications criteria, quality, affordability and adequacy, contracting criteria, is discussed and a final evaluation of the program is made using the standard of living conditions from the 1948 Universal Declaration of Human rights.

1. Introduction

The shortage of affordable houses to attend to low-income population is one of the greatest challenges faced by the Brazilian government over the years. A combination of lack of serious housing policies dedicated to attend to the low income population, poor performance of government housing agencies, turbulence in the economy, low availability of credit, and the constant arrival of low-income families migrating into urban centers looking for better economic opportunities, created a chronic deficit of affordable houses to attend to the low income population of the nation.

By 1995, the deficit level reached 5.5 million units; 10 years later it increased to 7.2 million units, and in 2009 the deficit decreased to 5.8 million units [1]Sousa, (2012). It is estimated that by 2013 the housing deficit will reach 8 million units [2]White (2011).

According to [2]White (2011), every year about 1.5 million households are required to supply country needs, while builders construct only half that number of housing units due to the scarcity of lines of financing designed to attend to the construction of affordable housing projects.

Historically, the availability of credit lines to finance affordable housing projects is continuously in deficit to attend to demand. Data collect by [2]Cardoso (2013) covering a period of 20 years indicates an average of 105,703 units/year with high value of 400,769 units/year in 1991 and a low value of 28,902 units/year on 2002. During the period of 1993- 2005 the annual average reached 43,008 units/ per year. The annual deficit trend was broken in 2010 with a record quantity of 718,449 units financed in 11 months as shown on Figure 1.

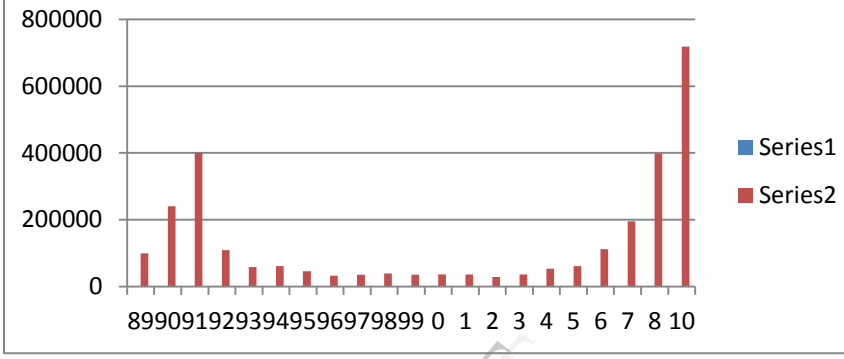
This outstanding increase in the total of affordable housing financed was possible due to a government program called "Minha Casa, Minha Vida (My Home, My Life , (MHML) launched in 2009 with the aim to build one million subsidized affordable houses across Brazil in a short period of time. The success of the program was outstanding with more qualified buyers applying for finance than the amount of housing supply offered. The program was revised in 2012 with the aim to increase the construction of 2 million more houses and condos until 2014. After the revision, the program was named as MHML phase II.

Historically, it is the first time in the nation that a housing program is structured to offer 3 million affordable houses in a short period of time focusing on the needs of the low income population. The MHML program is the 9th housing program launched by government since 1964. According to [3]Cardoso (2003) the performance of previous housing programs was poor due to political and institutional

instability in which the housing program was administrated by seven different government agencies in a period of 17 years. According to [1] Sousa (2012) the low output of houses financed during years 1995 and 2003 benefited the median class more than the low income class. Actually the housing program MHML is managed by the Ministerio das Cidades (Ministry of Cities) created in 2003.

The aim of this paper is to discuss key issues of the MHML program aiming to evaluate its quality and adequacy based in criteria used by the standard of living conditions from the 1948 Universal Declaration of Human rights and UN-Habitat.

Figure 1- Affordable Houses Financed during 1989-2010



2. More for the Poor Concept

The program My House, My Life was created by a Federal decree # 6962 signed on September 17, 2009 by President Lula to build 1 million houses, with the allocation of R$ 35 billion ($ 19.23 billion), in which R$ 34 billion ($18.68 billion) dedicated for construction of affordable housing and 1 billion ($.55 billion) for infrastructure to be operated and managed by Caixa Economica Federal (CEF) a fully government owned savings and mortgage bank.

According to [4]Andrade (2011), the MHML program was inspired in the housing programs from Chile and Mexico and was drafted by the contractor's association of Rio de Janeiro with heavy emphasis in the principles of sustainability of affordable housing projects to attend low income population. The project was seriously focused to deliver benefits in such way that groups with higher social disadvantages could benefit more than groups with better social advantages. The level of subsidy offered by the program can reach 95% of the total mortgage depending on the combination of financial and social factors applied for a family.

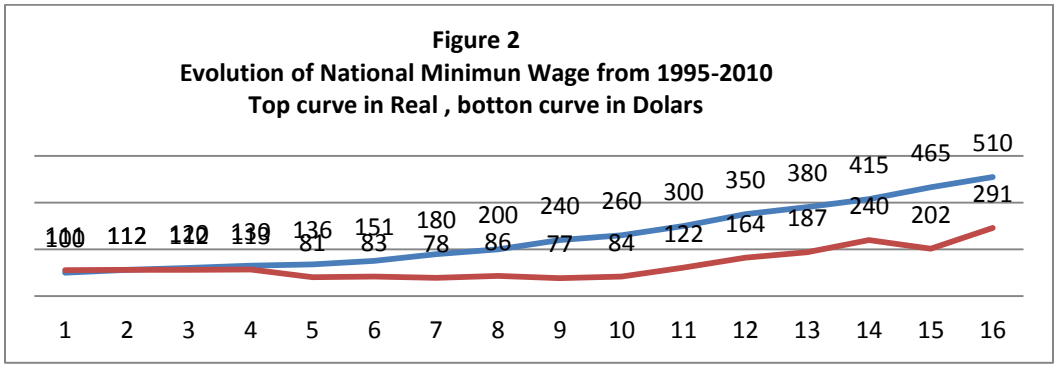
3. Financial Criteria Concept

The low income population is defined by the MHML program as the population universe that earns up to 10 times the national minimum wage (NMW) that is established politically once a year. Every year the nominal value of the NMW is increased, however due to inflation its real value sometimes decreases. Considering the evolution of the NMW from 1995-2010 in Real currency it increased from R$100.00 to R$510.00 in the period, which equals to 421% increase. If the value of each NMW is converted in dollar currency for the same period it increased from $111.00 to $291.00 which equals to 162% increase. Besides the fact that the NMW increased 421% in it nominal value, it real value increased only 162% as shown on Figure 2.

Before 1995, the equivalent value of the NMW in dollars was below $100.00 per month. By 1995 it reach the level of $100.00 reaching $291 dollars in 2010. With this level of appreciation in the NMW the poor populations started to have access to goods and foods historically inaccessible. With this new financial power level the poor population was able to qualify for government housing programs.

Based on the amount of NMW earned by all family members, the program established the criteria to select groups of the population in four different levels of affordability. Families with an income level between 0 and 3 NMW (group 1) are the group qualified to receive a large amount of subsidy,

associated with better mortgage financing conditions. decreased proportionately with the income increase of others groups. Income levels between 3-5NMW are classified The level of subsidy and financial conditions as group 2, income levels between 5-6NMW are classified as group 3, and finally income levels between 6-10NMW as group 4.



Source: [5]IBGE-IPEA (2012)

The amount of subsidy awarded varies with the location of the projects and size of the cities as well as the financial bracket of each family. Table 1 shows the subsidy distribution based on the income level and Table 2 shows the financial condition of the mortgage based also in the income level. Under these criteria, families with zero income or ultra-low income are selected to receive finance with zero down payment and a mortgage payment of a maximum of 10% of the monthly family income or R$50.00 ($27.47) per month, selecting the one with highest value for final mortgage value. Once one of those values is selected it will be the mortgage value to be paid up to the end of the contract. This value is subtracted from the total gross mortgage payment and the balance is subsidized by the program. On phase II of the program these parameters were revised and changed to the levels of 5% of the income or $25.00 ($13.73) for mortgage payments, selecting the one with higher value to be the mortgage payment.

Table 1
Subsidy provided per family income band for new houses. Conversion factor (R$ 1.82/$)

Region	3 x (NMW)	4 x (NMW)	5 x (NMW)	6 x (NMW)
	New house	New house	New house	New house
SP,RJ,DF	RS 23,000 ($12,637.36)	R$ 16,000 ($8,791.20)	R$ 9,000 ($4,945.05)	R$2,000 ($1,098.90)
Cities with more than 100,000 inhabitants	R$ 17,000.00 ($9,340.65)	R$10,000.00 ($5,494.50)	R$ 3,000.00 ($1,648.35)	2,000.00 ($1,098.90)
Cities with 50,000 up to 100,000 inhabitants	R$ 13,000 (7,142.85)	$6,000 (3,296.70)	R$ 2,000 ($1,648.35)	R$ 2,000 ($1,648.35)

Source: [3]Cardoso (2013)

4. Example of Mortgage Payment Calculation

An example is provided by CEF guide with a hypothetical value for financing and gross family monthly income to calculate the net value of the monthly mortgage.

Assuming amount financed to a perspective family of: R$ 60,000 ($ 32,964.00)
Gross monthly mortgage payment calculation: R$ 60,000/ 120 mo. = R$500.00 ($274.7) per mo.

Assuming monthly family income equals to: R$ 600.00 ($329.64)
Net monthly mortgage payment calculation: R$600.00 x 5% = R$ 30.00 ($16.48)
Since $30.00(16.48) is higher than R$25 (13.73), use highest value as final net mortgage.

Value of subsidy calculation: Value of gross monthly mortgage less final net mortgage:
R$500.00(274.7) – R$ 30.00(16.48) = R$470.00 ($258.21) ,[6] CEF(2012).

Table 2
Mortgage Conditions based on family financial bracket of MHML program- Reference: CEF

Financial bracket	Max mortgage value R$($)	Mortgage conditions	Mortgage payment
0-3 NMW	R$ 38k-52k (16.48K-28.57K)	Zero interest + Reference tax²	Up to 5% of income or RS 25.00 ($ 13.73)
3-6 NMW	R$ 130k	5-6% /yr interest + Reference tax²	Up to 20% of income
6-10 NMW	R$130k	8.16% /year interest + Reference tax²	Up to 20% 0f income

Source [3] Cardoso(2013) Reference tax² adjust currency value

5. Social Criteria

Other criteria used to prioritize the selection of candidates for the houses were to give priority to families with more social needs in the following order: (1) Families where the woman is responsible for the household family members, (2) Families with handicap members, (3) Families living in risk areas or displaced from their houses,
(4) Population coming from traditional poor communities. (5) Minimum 3% of the house units must be for seniors.

Another social attribute is to help low income families living in places with low economic activity. For this reason 40% of the houses must be built to attend to population classified in the band of 0-3 NMW, living in areas with a population up to 50,000. 40% of the units were reserved for populations in the financial bracket of 3-6 NMW, and finally 20% of the units reserved for families in the income bracket of 6-10 NMW.

6. My House, My Life Program Phase II

In 2012, the government launched phase II of the program MHML with the aim to build 2 billion more units with an new investment of R$ 71,7 billion ($ 25.85 billion). At this phase the criteria to qualify for subsidy was revised for houses located at urban and rural areas. For urban areas the monthly gross income per family was divided in three bands and fixed as: up to R$ 1,600 ($800) for band 1, up to R$ 3,100 ($ 1,550) for band 2, and R$ 5,000 ($2,500) for band 3. For the rural areas the annual gross income was also divided in three bands: up to R$ 15,000 ($7,500) for band 1, up to R$ 30,000 ($15,000) for band 2, and up to R$ 60,000 ($30,000) for band 3. The monthly payment for families with incomes in the band 1 was reduced to R$25.00 ($12.5) in place of R$ 50.00 ($ 27.47) that was the value used on the first phase of the program.

7. Project Specifications Criteria

The technical specifications establish the quality of the construction project. They detail the materials, equipment and workmanship that should be incorporated into the project. The types of specifications provided to contractors by CEF are the performance specifications in which they present the expected results of the work and leave the construction methods to the contractor. The set of specifications was only two pages and it was provided to contractors before the bid process giving them the freedom to design the unit layouts based on the best performance.

The specifications called for the construction of brick houses and reinforced concrete apartment buildings with ceramic tiles in the roofing for houses and concrete slab for building tops. Each living unit should have at least 2 bedrooms, 1 living room, 1 bathroom, 1 kitchen, 1 service area and an area for future expansion. The internal area of each unit should have a minimum 32 m² (344.4 ft²) and 37 m² (398 ft²), respectively, for houses and apartments, which is classified as a compacted unit when compared with traditional houses and apartments. It is the responsibility of each designer to accommodate at each room a list of furniture and appliances provided by specifications. Under this approach it is

expected that contractors will compete to present their best projects that will be selected based in the value added and final cost. Figures 3 and 4 are examples of contractor proposed layouts for houses and apartments.

Figure 3

Figure 4

8. Contracting Criteria

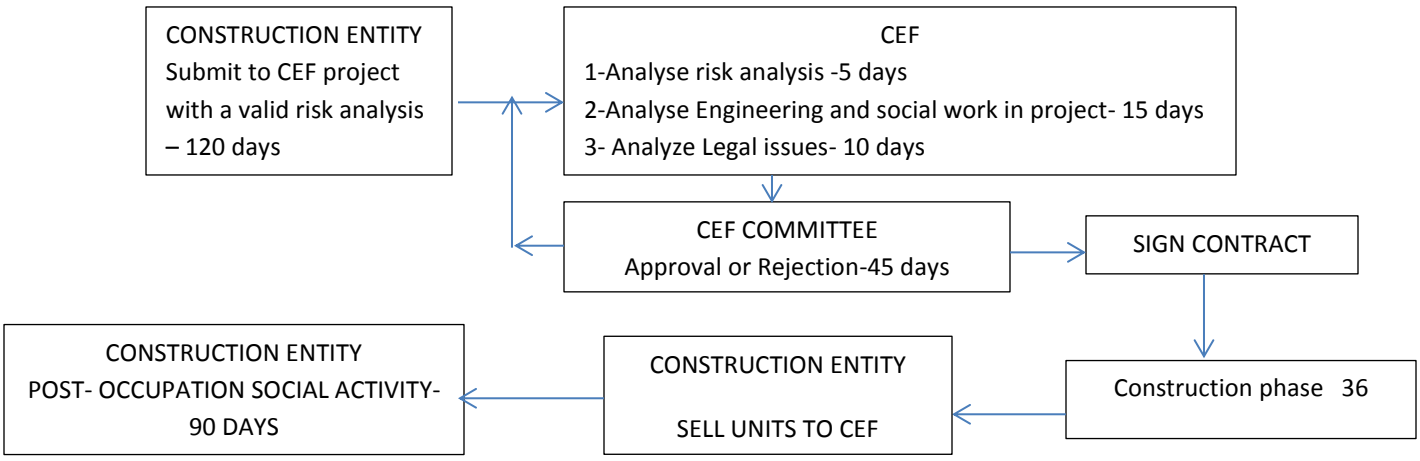
The MHML program adopted the design –build (DB) contract model for the majority of the projects. Under this type of contacting the construction entity is responsible to design and build 100% of the projects. There are different types of arrangements on DB contracts covering cost, risk, payments, and specifications. The MHML program adopted the following agreements: (1) cost agreement as lump sum; (2) risk allocation to be totally transferred to the construction entity, which is characteristic of governmental projects; (3) for contract payment the percent complete agreement is used with one specific arrangement about the max amount that can be billed every month, that is a cap of 8.5% of the total project cost, with 5% of the total project cost to be paid at the end of project; and (4) type of specifications adopted is the performance specifications in which the owner provides the requirements for the end result of the project.

Contractor's proposals are selected based on 8 attributes and once a proposal is selected a project is submitted for approval, contract signature, and construction. Once construction is finished, each construction entity sells the units to CEF. After units are occupied it is the contractor's responsibility to provide a social evaluation of the project checking if the social objectives of the program were reached. Figure 5 shows the steps of the process for a winning proposal.

The construction entity usually is responsible to locate, legalize and buy the lot if it is not donated by the county or state. The lot size can vary and should be selected to accommodate from 25 up to 500 units depending on the type of project. Figure 5 shows the main steps of the bid and contracting process.

Figure 5

Steps for project submission, approval/rejections, construction and post occupation activity.



9. Cost and Profit Forecast

The cost of each unit is pre-fixed by CEF and varies with the location of the project. There are 8 different cost values between the lowest value of R$ 49,000.00 ($26,920.60) up to the highest value of R$ 76,000.00 ($46,754.40), averaging a unit cost of R$65,250.00 ($ 35,848.35), using the 2009 dollar change rate. The value of the site for each project cannot be more than 15% of the total cost of the project including legalization costs. The design, administration and technical assistance of each project is limited to be charged at 8% of the total cost of the project, and the social work cost of each project is between 1.5-2% of the total cost of the project in accordance with the number of units built in the project. Using 2% for social costs, these costs add up to 32% of the total project cost. In order to evaluate the magnitude of profit each company can achieve in conducting one of the MHML projects an abbreviated income statement is shown on Figure 6 using a hypothetical cost structure for one typical construction entity. Assuming that a hypothetical construction entity is declared the winner of a project with 500 units contracted at the average cost of R$62,250.00/unit , and have the following cost structure: with land costs =15% [6](CEF 2012), construction costs = 50% (typical value), variable overhead includes 8% + 2% +2% =12% [6](CEF, 2012), and, fixed overhead = 7% (typical value). The value of fixed overhead used is typical for one isolated unit due to the construction of the same type of units in the same place; it can be reduced to 4% which increases the net profit value to R$ 5,937,500 ($ 3,092,448). Using the parameters of this example, each project generates a net profit level of above R$ 5 million ($ 2.6 million) which is considered an excellent deal for the construction industry due to the level of profit generated per project. However, only high capitalized construction entities qualify to manage these projects due to the large amount of capital required to buy land. In reality, four major construction companies qualified for the majority of the projects. At the time that the MHML project was launched, some construction companies advertised a profit of 25% to attract investors to the MHML program.

Figure 6-Abbreviated Income Statement for project with 500 units

	R$	$	%
Net Sales	31,250,000	16,276,042	100
cost of land	4,687,500	2,441,406	15
Cost of Construction	15,625,000	8,138,021	50
Gross Profit	10,937,500	5,696,615	35
Variable Overhead	3,750,000	1,953,125	12
Fixed Costs	2,187,500	1,139,323	7
Net Profit	5,000,000	2,604,167	16

10. Quality Concept

As mentioned before, the quality of the project is dictated by the specifications contracted. The program adopted the use of performance specifications in which the contractor ultimately is responsible to procure construction materials with high quality to be incorporated in the project. According to [1]Cardoso (2013) there is not a clear structure to control quality. Once CEF, the owner of the project is more concerned with the scheduling and payments, leaving the quality control to other government agencies that are not prepared to perform this kind of service. Structural problems, wall fissures, infiltration, lack of proper drainage, lack of flood control, and ceramic tiles coming out of the wet areas are the prevalent problems reported by owners. Recently 2 out of a total of 11 buildings ready to be delivered were required to be demolished before occupancy due to structural instability, [7]Bernard (2013).

According to [8]Vieira (2013) contractors are using concrete blocks in place of masonry blocks in areas where masonry blocks are more appropriate to comply with local weather, for the purpose of increasing profit. Another observation is the construction of shallow foundations in the houses.

According to [9]Blanco (2013), government is aware of the problem and in response to it a channel of communication with the beneficiaries of the MHML program was created to report any defect or

problem found in their properties. As soon as the complaint is filed, CEF will give contractors five days to fix it. If the contractor fails to fix the problem it will be prosecuted and they will lose their right to provide future services for government.

According to [10]Anstassakis (2013), ex-president of the Brazilian Institute of Architects, the non-conformities of the MHML units should be treated as a "police case" once CEF receives good money to check quality; however there is omission to perform the job. On July 2013, the Brazilian Federal Police started an investigation to determine if fraud was practiced in the program due to accusations of creation of lobbies to increase land price, and other issues that are under investigation.

Structural problems are classified as defects of the project and should be seriously resolved before the structure receives its certificate of occupancy. Assuming that all structural related issues of each unit can be resolved, an overall analysis of the quality of the project can be made. UN-Habitat (2003) offers a criteria to evaluate quality of the dwelling using four indicators that are: (1) space per person, (2) permanent structure, (3) access to drinking water supply, (4) access to adequate sanitation. Each of these indicators will be discussed and evaluated against the MHML projects.

Space per person – The ideal is a design that provides 14.7 m²/person, (148.9 sf/person).

MHML project- According to the specifications each house is projected to hold up to 4 inhabitants, which requires a minimum area of 58.8 m² (587.5 sf). Since the specifications indicate a minimum area of 32m²-37m² (344.4sf-398 sf), it fails in this item.

Permanent structure-permanent material should be used, quality materials for wall, floors and roof, compliance with local building codes, standards and bylaws, avoid location in hazardous zones like landslide, flood area.

MHML project: According to the quality complaints discussed above it fails in the quality material used and avoid flood areas for some projects.

Access to drinking water supply- MHML project: Treated water is supplied for every project as standard in Brazil. Future water treatment is required to achieve drinking water quality

Access to sanitation- A settlement is adequate if is connected with public sewer or septic tank. MHML project: The location of the majority of the projects is located far away from urban centers, usually in the periphery of cities, with the use of septic tanks.

11. Affordability, Inequality and Adequacy

According to the housing authority in the USA the accepted definition of affordability is for a household to pay no more than 30 percent of its annual income on housing, [12]HUD.GOV (2013). For the Brazilian MHML program the criteria used is for a household to pay as low as 5 percent and as high as 20 percent depending on the family income level, which can be classified as very generous criteria when comparing it with the HUD definition.

With the growth increase of urban centers in Brazil an increase in the quantity of slums was observed mainly due to the lack of affordability of the low income population. The UN-Habitat report on human settlements of 2003 identified the presence of four types of slums in Rio de Janeiro and Sao Paulo, the two major cities of Brazil, as: "Favelas", "Loeteamentos", "Invasoes" and "Corticos" that are defined below:

Favelas - These are highly consolidated residential areas of self-construction on invaded public and private land and without infrastructure, built with inadequate materials (old wood, tin, cans, and even cardboard).

Loteamentos - Those comprise illegal subdivisions of land not in compliance with planning rules or infrastructure. They are considered irregular if submitted for regularization by the planning authorities and clandestine if they have not.

Invasoes - These consist of irregular occupation of public or private land still in the process of consolidation. They are frequently located on riverbanks, swamps, hills or in residential public areas, such as under viaducts and along roads.

Corticos - These comprise social housing formed by one or more buildings located on a single plot, or shared rooms in a single building. The dwellers share bathrooms, kitchens and sometimes electrical appliances. Houses lack ventilation and lighting; they are frequently overcrowded, and one room may house many people while accommodating multiple uses.

With the creation of the MHMF programs, Brazilian authorities were able to relocate families mainly from "Loteamentos", "Corticos" and "Inavasoes" into houses and apartments. It is easy to imagine the level of satisfaction of a family moving out of a slum into a real housing project, however it is necessary to analyze if the houses offered in the MHMF are considered adequate.

Adequate housing was recognized as part of the right to an adequate standard of living in the 1948 Universal Declaration of Human Rights and the 1966 International Covenant on Economic, Social and

Cultural Rights. According to [13]UN Habitat (2011) there are 7 elements that must be met in order to be considered an adequate housing. They are: (1) security of tenure, (2) availability of services, materials, facilities and infrastructure, (3) affordability, (4) habitability, (5) accessibility, (6) location, and (7) cultural adequacy.

12. Analysis and Conclusion

There is a trade-off between residential location and transport for low-income households. As mentioned in the literature, the majority of the sites selected to implement MHML projects were located on the inaccessible periphery of the urban areas which imposes high commuting time and costs. A comparison between the transportation costs and the monthly mortgage value of a household classified in the lowest income level of the program, for just two persons commuting one time per day, twenty days per month, equals monthly the equivalent of 9.6 times the monthly mortgage payment. One of the beauties of the MHML program is the level of affordability design to tend to the poor, however due to the location of the projects the poor are penalized financially with transportation costs.

Under the rules of the MHML program, contractors are the ones responsible to locate the appropriated sites for implementation of the housing projects. Under lump sum contract the minimization of costs is prioritized to generate high levels of profit which is a business reason to perform the location and selection of proposed sites on inaccessible periphery of urban centers where land is more inexpensive. One of the remedies to resolve this dilemma is an old tactic used by the construction industry when they use their own funds to buy proposed sites. Economically, there is more advantage to select strategic construction sites that are close to all facilities of an urban center at prime price. This cost can be diluted by maximizing the potential of the site using vertical construction in order to decrease the land cost associated to each unit. Why was this option not used? The answer should be found in one of the accusations made by groups of dissatisfied homeowners, that contractors where concerned only with profits, lacking respect for the adequate application of government funds.

Data collected during 20 years indicates that 2.1 million affordable houses were financed, averaging 105,703 units per year with periods reaching the average of 43,008 units/year, and years with production below 30,000 units/year. The MHML program offered 3 million units of affordable houses to be built in a period of 4 years. This means that the MHML accomplished more in 4 years than others programs in 20 years. It is the first time in history that government willpower prevailed over political discourse. It is the first time that a housing program meant to really tend to the low income population in their housing needs. This credit should be shared with the team that worked in the financial architecture of the program, as well as with the appreciation of the NMW value that enabled poor people destined to be in their slums for the rest of their lives to acquire tenure security. There is a consensus in the population, disregarding the political orientation, that the MHML program reduced the level of inequality of the nation.

The level of affordability proposed at the first phase of the MHML program was 10% of the income level of a household family, and it was reduced to 5% two years later at the second phase of the program. Comparing this level of affordability with the level of 30% used in the USA indicates that the MHML designed the house program prioritizing to tend to the real low income spectrum of the population. In the past, housing programs were labeled as a design to tend to the needs of the low income population, however the low income population was unable to qualify and benefit from the programs.

The policy to provide more for the poor used the inclusion of social factors to prioritize prospective households in the low income population, tending to the more socially disadvantaged. It is the first time in the nation that the housing programs social factors have more weight than financial factors.

The specifications provided to contractors are more quantitative than qualitative which allows contractors to select construction material in a large quality spectrum. On lump sum contracts the maximization of profits comes with minimization of costs in which materials with low cost are the selected ones if permitted by specifications. In my opinion it is an unethical behavior to proceed this way once the competitive bid was based on value added to the project.

The quality of the MHML projects is highly criticized in the literature. Another way to analyze the level of quality of the program is using the four indicators of quality proposed by Habitat (2003) that are: (1) space per person, (2) permanent structure, (3) access to drinking water, and (4) access to sanitation. Using the weight allocation of 25% for each indicator, the final score will be 50% once they fail on the space per person and permanent structure indicators. Besides the fact that the Brazilian housing program fails under the standards of UN-Habitat, it is important to mention that the proposed floor areas are considered as a minimum nucleus that can be expanded in the future, as described in the

project specifications. Under this perspective it is better to provide a decent minimum place for a low-income family, removing them from the status quo of ultra-poverty level.

The evaluation of adequacy of the units is made using the 7 elements proposed by [13]UN-Habitat (2011), which are: security of tenure; availability of services, materials; affordability; habitability; accessibility; location and cultural adequacy. In my opinion only three elements are present in the MHML projects. They are: security of tenure, affordability and habitability. Since the majority of the location of the projects are in the periphery of the urban centers, they disconnect the population from essential services and force them to be dependent on transportation to access work, school, hospital, supermarkets, banks, theaters, restaurants, and all infrastructure of a small city. For these reasons it failed in the areas of availability of services, accessibility, location and cultural adequacy. Since only 3/7 of the elements are met, the adequacy level is 42.8 percent.

In conclusion, the political aim of the MHML program established a new era in the housing projects outputs and is evaluated as excellent. The level of affordability offered by the MHML program is evaluated as excellent due to the accessibility of poor families in the program. The set of specifications proposed by the MHML is evaluated as poor. The quality level of the units is evaluated as fair (50%), and the level of adequacy of the projects is evaluated as poor (42. 8 %).

The level of profit generated by each project indicates that the MHML program provided an excellent deal for the construction industry, however due to the large amount of capital required initially to buy land only few construction entities qualified for the program. Being a government program is recommended to increase competitively in order to achieve better aggregate values for the projects.

For these reasons, it is recommended improvement in the following areas: planning in selecting better project locations, rewriting of project specifications, enforcement of quality levels of units, infrastructure, insertion of housing projects into urban centers, contract conditions, and more competition between construction entities.

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