

Minha Casa Minha Vida - a critical perspective; Possible alternatives and improvements.

José Nuno Beirão

Faculdade de Arquitectura, Universidade Técnica Lisboa,
Portugal / bquadrado arquitectos, Portugal
jnb@fa.utl.pt / jnb@bquadrado.com

ABSTRACT

This paper exposes a criticism on the Brazilian social housing program “Minha Casa Minha Vida” (MCMV) and provides a few strategies for improving results. The role of new technologies is addressed as a way of enhancing the results of those strategies.

KEYWORDS: Housing; Design process; New production systems

Introduction

Several critics have been pointed to the Brazilian social housing program “Minha Casa Minha Vida” (MCMV) regarding its sustainability in medium and long term (Pedro & Boueri, 2010). Seven particular aspects were pinpointed:

- MCMV program proposes only two bedroom dwellings with extremely limited maximum areas – 35m² for single family houses and 42m² for apartments.
- The single type tends to induce the production massive extensions of the same type creating a monotonous urban environment.
- The program produces extensive mono-functional areas with no concern on the qualification of the new neighborhoods and no strategies for evolution.
- The living area per inhabitant is very small, close to a critical limit where pathologic behavior tends to occur.

- There are no areas for complementary activities within the dwelling spaces such as study areas which are fundamental for children’s regular development.
- At the urban scale, MCMV program tends to accumulate the many errors pointed to urbanism (Jacobs 1961): social segregation, mono-functional areas, monotonous environment, small accessibility and absence of visual references.
- Due to the extreme low cost limitations, the construction techniques are quite poor resulting in massive areas of precarious housing.

Considering the above, we should conclude that MCMV, although well intended in its nature, is intrinsically unsustainable and end up in a long term costly scenario. If nothing is done, we should expect in a near horizon of 10 to 20 years to have large segregated urban areas with decaying and unqualified constructions - a panorama almost as bad as the present *favelas*.

Conceptual approaches

However dark this scenario may seem, there are strategies that may invert this tendency. Let’s isolate

four levels of intervention in terms of conceptual approaches to design and implementation: (1) urban level; (2) typology and (3) construction technologies; and one level regarding (4) the development of new implementation policies.

(1) Urban level

Two main issues should be taken into consideration: first, the location of developments should be as much as possible close to consolidated areas to avoid social segregation and improve integration of communities; second, diversity of uses should be promoted by adding spaces for building facilities according to the communities' needs. Populations should be mixed. A blend of social classes and urban diversity in general are usually defended as good strategies for the development of wealthy and successful urban environments. Considering the goal of diversity of uses, it should be stressed the importance of complementing the urban environments with adequate facilities for serving populations and promoting diverse activities. Such strategy is actually supported by some architects as a way of starting rehabilitation synergies within slam areas (see for example the work of Urban Think Tank). Contrary to common belief, if correctly located commercial activities set as urban complements can actually be lucrative improving the overall sustainability of the plan.

(2) Typology

Traditional housing types embed features of their social and cultural environments (Habraken, 1988). Likewise, housing types among the lower income classes tend to evolve along time usually based on self constructed improvements and extensions. The reason is simply because lower income classes need to manage their resources the most economical way. The favelas are actually the proof of it: low income classes are willing to build their houses. Therefore, thinking social housing concepts based on evolutionary housing principles and self construction seem adequate strategies. The Chilean architect Alejandro Aravena proposed a progressive approach to construction starting by building elementary space for families defined by a minimum built area and a potential external space. The built area contains the essential functions of a house – kitchen, wc and a minimal open space corresponding to the maximum space that can be built with the available funding (Aravena & Iacobelli, 2010). The basic concept stems from the evidence that the involved low income populations are usually engaged in building or extending their own houses and may therefore customize or extend space according to their needs and financial capacity. The housing concept provides that space. Simultaneously, the core elementary building provides

also order to the housing ensemble.

(4) Construction technologies

Clear separation of support and infill should be designed considering the possibility of having modular components with several spatial combinations providing alternative or customizable solutions (Habraken et al., 1976). A paradigmatic example is the case of Malagueira neighborhood for which Duarte (2001) developed a grammar based system and interface to provide a customizable approach to the housing system designed by Alvaro Siza. Combinations between Duarte's strategy and Aravena's combined with new technologies may provide richer solutions than the current ones.

(5) Development of new implementation policies

Following the Dutch example, every housing development could be labored to include a mandatory amount of social housing shifting the burden of state investment to private investors and through them to the higher income populations

Technological approaches

The paper will show how the integration of new technologies and new design methods can be used to improve or integrate such strategies and enable a sustainable future for MCMV in achieving its commendable intensions.

(1) Urban level

At the urban level, the location of the new housing development should guarantee at least a good local integration, a reasonably close location to areas where the population previously dwelled and be compact. These principles should provide four important aspects: (1) a positive identification with the neighborhood; (2) keeping their main social relations and activities; (3) avoid the emergence of extra expenses due to a rise in daily travelling towards working locations; and (4) have a minimum critical mass to support other activities. The design of the new urban tissues and their integration in the existing ones is therefore of the utmost importance. Optional designs can be analyzed for testing their properties and evaluate their qualities. New technologies and methods can play a structural role in this kind of approach. For instance, space syntax analysis (Hillier & Hanson, 1984) may provide information on the topological integration of the proposed solution. Density analysis following the principles defined in Berghauser-Pont and Haupt (2010) using tools such as the ones described by Beirão et al. (2012), may provide comparative information on morphological features and about the compactness character of the solution. Comparative evaluation methods (Gil et al., 2011) can

also be used to obtain a multidimensional evaluation of solutions. The location of structural facilities can be determined following methods and tools as described by Montenegro (Montenegro et al., 2011)

(2) Typology

Regarding typology improvements and in particular the development of evolutionary housing systems several improvements can be achieved by recurring to the use of shape grammars (Stiny & Gips, 1972). Shape grammars have long been used for their capacity of capturing the rules beyond architectural styles and types (e.g.: (Mitchell & Stiny, 1978)). Being based on recursion they are also able to describe complex evolutionary systems and processes. And being rule based they can also provide a large universe of optional solutions. Considering the above mentioned features we can point three main uses of shape grammars for improving the quality of social house design: (1) they can be used to describe the conceptual rules of evolutionary systems (Mussi, 2011); (2) they can be used to provide alternative custom solutions (Duarte, 2001); and (3) they can be used to keep stylist features within a system being therefore able to keep within the universe of possible solutions the set of cultural (formal) properties that characterize a specific region or way of life. Properties of architectural types may therefore be captured into design systems taking advantage of the tacit knowledge embedded in them (Habraken, 1988).

(3) Construction technologies

The design and development of open building systems and customizable housing has been an interest of many architects and researchers for many years in the quest of solutions able to solve simultaneously housing demand, industrialization and customization without falling in the monotonous traps of mass production (Kendall & Teicher, 2000). Many difficulties have accompanied side by side the development of new systems. These difficulties concern essentially three topics: (1) controlling design; (2) controlling production and (3) establishing an adequate interface between customer's requests and fabrication. The first topic can be clearly solved by developing design systems expressed as shape grammars. The second topic can be achieved by adapting a construction system to the design language following a strategy as explained in Benrós et al. (2007). Finally, Duarte (2001) shows a very efficient interface which allows the users to customize their houses. The system Duarte proposes produces alternative layouts and detailed descriptions of each layout. In Benrós et al. such description is extended to a list of constructive components. The connection with a production based on digital manufacture of components is therefore possible and easy to implement.

(4) Development of new implementation policies

Many of the strategies referred above are likely to get stuck in lack of adequate policy or outdated bureaucratic procedures. Consequently, new policies will be needed to encompass with the new needs and development intentions. Many of the strategies explained above need an accurate understanding and support from those who have the power to uphold and invest. Urban plan flexibility and bottom up development need to be accepted and put into practice even though it may seem a loss in control. Such perception is due to the fact that laws and plan regulations till today have been essentially prescriptive and deterministic, and we should change towards more flexible approaches implementing goal oriented and performance based regulations instead of the prescriptive ones. This approach implies some education and the availability of reliable tools for measuring performance in order to effectively implement goal oriented regulations. Examples of such tools are given in detail in Beirão et al. (2012) where a City Information Model (CIM) connecting a geographic database with a design environment involving a tool for calculating urban indicators which provides accurate calculations of indicators and other properties of trial designs making available information support for decision making. Basically, the paper shows that it is possible to know in advance many measurable properties of design solutions in a particular context being therefore able to reduce risks on implementation.

Conclusions

This paper bases its approach on opportunities for improvement of the existing social housing programs and in particular of the MCMV program. The paper considers two complementary kinds of improvements: one involving new conceptual approaches and the second involving technological approaches able to enhance the former and especially to more accurately support decision. The paper discusses possible improvements on four different levels ((1) urban level; (2) typology (3) construction technologies; and (4) development of new implementation policies) showing how some technologies may improve results or better support decision making. It is arguable that a more intense use of such methods and technology will concur to provide more sustainable designs and support the development of better and more qualified urban environments.

References

- Aravena, A. & Iacobelli, A., 2010. *Elemental chile: A handbook on progressive housing*, Actar.
- Beirão, J., Arrobas, P. & Duarte, J.P., 2012. Parametric Urban Design: Joining morphology and urban indicators in a single interactive model. *Achten, Henri; Pavlicek, Jiri; Hulin, Jaroslav*;

Matejdan, Dana (eds.), *Digital Physicality - Proceedings of the 30th eCAADe Conference - Volume 1 / ISBN 978-9-4912070-2-0*, Czech Technical University in Prague, Faculty of Architecture (Czech Republic) 12-14 September 2012, pp.167-175. Available at: http://cumincad.scix.net/cgi-bin/works/Show?_id=ecaade2012_130&sort=DEFAULT&search=Beir%e3o&hits=11 [Accessed September 10, 2012].

Benrós, D., Duarte, J.P. & Branco, F., 2007. A System for Providing Customized Housing. *Computer-Aided Architectural Design Futures (CAADFutures) 2007*, pp.153-166.

Berghauser-Pont, B. & Haupt, P., 2010. *Spacematrix. Space, Density and Urban Form*, NAI.

Duarte, J.P., 2001. *Customizing mass housing: a discursive grammar for Siza's Malagueira houses*. PhD Dissertation. MIT.

Gil, J., Almeida, J. & Duarte, J.P., 2011. The backbone of a City Information Model (CIM): Implementing a spatial data model for urban design. *RESPECTING FRAGILE PLACES [29th eCAADe Conference Proceedings / ISBN 978-9-4912070-1-3]*, University of Ljubljana, Faculty of Architecture (Slovenia) 21-24 September 2011, pp.143-151. Available at: http://cumincad.scix.net/cgi-bin/works/Show?_id=ecaade2011_104&sort=DEFAULT&search=Gil&hits=10 [Accessed June 6, 2012].

Habraken, N.J., 1988. Type as a social agreement. In *Proceedings of the Asian Congress of Architects, Seoul*.

Habraken, N.J. et al., 1976. Variations: the systematic design of supports. *MIT*.

Hillier, B. & Hanson, J., 1984. *The social logic of space*, Cambridge University Press Cambridge.

Jacobs, J., 1961. *The Death and Life of Great American Cities: the failure of town planning*, Penguin books.

Kendall, S. & Teicher, J., 2000. *Residential open building*, Taylor & Francis.

Mitchell, W. & Stiny, G., 1978. The palladian grammar. *Environment and Planning*, pp.5-18.

Montenegro, N. et al., 2011. 4CitySemantics: GIS-Semantic Tool for Urban Intervention Areas. In *Proceedings of the 7th Virtual Cities and Territories Conference - 7VCT*. 7th Virtual Cities and Territories Conference - 7VCT. pp. 549-554.

Mussi, A.Q., 2011. Projeto de HIS evolutiva: gramática da forma para a ampliação da unidade habitacional mínima. In *Proceedings of 2º. Simpósio Brasileiro de Qualidade do Projeto no Ambiente Construído*. 2º. Simpósio Brasileiro de Qualidade do Projeto no Ambiente Construído X Workshop Brasileiro de Gestão do Processo de Projeto na Construção de Edifícios 03 e 04 de Novembro de 2011. Rio de Janeiro, Brasil, pp. 60-70.

Pedro, J.B. & Boueri, J.J., 2010. Exigências de espaço aplicáveis à construção de habitação de interesse social: Comparação entre Portugal eo Município de São Paulo. *Relatório 438/2010-NAU, LNEC*.

Stiny, G. & Gips, J., 1972. Shape grammars and the generative specification of painting and sculpture. *Information processing*, 71, pp.1460-1465.