

LEARNING FROM THE POOR

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Abstract

Post-disaster housing solutions are rarely developed upon empirical information and case-based knowledge. Instead, solutions for housing reconstruction are usually the result of what a restrained group of professionals from the formal sector consider the most appropriate solutions given the limited resources available. Very often, these solutions fail to address the expectations of the users and to efficiently address the needs of low-income families.

Spontaneous housing construction provides crucial information about how low-income families (and, in general, the informal sector) normally cope with limited resources to solve their needs for shelter and services under extreme conditions. A detailed analysis of spontaneous housing in Colombia and South Africa demonstrates that despite cultural differences, various common characteristics exist in the housing solutions of the informal sector. The comparison of these characteristics with previous studies conducted in India confirms the existence of fourteen common patterns among the cases studied. Despite the fact that the informal sector has been the only sector capable of housing the majority of poor residents in developing countries, many of these characteristics are often neglected in post-disaster low-cost housing reconstruction. In fact, the solutions and priorities of formal post-disaster projects often contradict the ones used by the informal sector. While the formal sector seeks to reduce costs through standardization, uniformity and speed through mass production, the informal sector emphasizes variety, often slow evolution and recycling. If properly adapted to contextual aspects, these fourteen patterns bring important lessons for improving post-disaster housing solutions.

Keywords: informal housing sector; post-disaster reconstruction; low-cost housing; emergency housing; spontaneous housing solutions

INTRODUCTION

The systematic observation and analysis of spontaneous housing in order to bring information to the development of housing strategies is not new. In fact, this

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approach has been promoted by various researchers since John Turner (1972) first challenged the idea of conventional housing norms and promoted a better understanding of the housing standards of the informal sector. Since then, important authors in the field of low-cost housing such as Peter Kellet and Graham Tiple (2000) or Vikram Bhatt and Witold Rybczynski (1999) have proposed similar approaches for a better understanding of low-income families' needs and the solutions they require. Keivani and Werna (2001) also distinguish between the conventional (formal) and the unconventional (informal) provision of shelter. According to Bhatt and Rybczynski (1999), "In spite of its often spontaneous and improvised character, the informal sector, which maximizes self-help and mutual aid building, has been virtually the only group that has had any success in providing appropriate, low cost solutions to the shelter problems of the urban poor".

Very little, if any, of this knowledge has been applied by NGOs and governments for the development of post-disaster housing reconstruction (Johnson, Lizarralde and Davidson, 2005). Instead, organizations leading post-disaster strategies often opt for the development of pre-conceived forms of housing that a group of experts consider "appropriate". In some cases, the concerned community is consulted regarding these solutions, in a simulation of involvement of the beneficiaries in the design process. Unfortunately, this involvement easily falls into tokenism and contributes very little to upset the balance of the decision-making power of the professionals that benefit from their eloquence and from the power given them by their capacity to use resources and technical knowledge (Davidson et al., 2005).

This study seeks to validate the following hypothesis:

Post-disaster reconstruction projects developed by the formal sector in developing countries ignore solutions and strategies that are used in the informal housing sector to efficiently shelter the poor.

This research does not suggest that post-disaster reconstruction projects must automatically duplicate the solutions of the informal construction. However, the study does assume that it is unwise to ignore solutions that have proved effective in many years of construction in the biggest construction sector in the world: the informal housing sector. Even though contextual characteristics might alter the application of the findings of this study, the research itself will demonstrate that some principles are common to various contexts, regardless of cultural, economic, political and social differences.

RESEARCH METHODS

In order to validate the proposed hypothesis, this research compiles results of various studies. The methods follow the case study methodology (as suggested by Yin, 1984) through a non-chronological sequence of eight activities:

1. Visits to and analysis of post-disaster projects in Colombia, El Salvador, Turkey and Honduras. Collection of drawings, project reports, pictures and notes.

2. Visits to informal settlements in Bogotá (Colombia) and Cape Town (South Africa). Collection of data through drawings, pictures and notes.
3. Identification of common characteristics among the informal settlements.
4. Comparison of the characteristics found in activity “3” with results of previous research in order to obtain common patterns.
5. Identification of common characteristics in post-disaster reconstruction projects in El Salvador, Honduras and Colombia.
6. Comparison of the characteristics found in activity “5” with results of previous research in order to obtain common patterns.
7. Comparison between the patterns found in activities “4” and “6”.
8. Condensation of research results and analytical generalizations (Yin, 1984).

The research included four case studies of spontaneous housing (called in this paper “informal solutions”):

- a. Spontaneous housing in Bogotá (barrio El Paraiso) and Armenia, Colombia: (First-hand information, study conducted in 1992 and 2002). Built by low-income residents along the “circunvalar” highway. The houses - that range from cardboard shacks to 3-storey masonry houses – have been and still are constantly consolidated; indeed, the settlement was later “legalized” and the infrastructure was upgraded.
- b. Spontaneous housing in Cape Town. Settlements of Guguletu and Mitchel’s Plain: (First-hand information, study conducted in 2006) Spontaneous construction built by mostly-black residents in illegally occupied land. During a 2-week period, 250 housing units recently had to be relocated in order to free the space required for the construction of the municipality’s infrastructure upgrading project.
- c. Spontaneous housing in informal settlements of Indore, India: Study conducted by Vikram Bhatt and Witold Rybczynski through the Minimum Cost Housing Group of McGill University, published in Dines and Brown (1999).
- d. Spontaneous housing in informal settlements in New Dehli, India: Study conducted by Peter Kellett and Graham Tipple (2000)

Six case studies for post-disaster housing (called in this paper “formal solutions”) were also conducted:

- e. Choluteca, Honduras: Post-Mitch reconstruction project developed in 1999 to relocate about 2000 families of the Choluteca region. More than 18 local and international NGOs participated in various projects of one storey detached units.
- f. La Paz, El Salvador: Post-earthquake reconstruction project of detached 36m² houses developed in 2001 and 2002 by the Salvadorian NGO FUNDASAL (Lizarralde, 2004).
- g. El Cantarito, Colombia: 972 houses built by Colombian NGO Antioquia Presente in the “Cantarito” settlement (La Tebaida town). The 72 m² masonry units were built as a relocation project for families affected by the 1999 earthquake (Lizarralde, 2004).

- h. Calarca, Colombia: Post-earthquake (1999) housing project developed by Colombian NGO Fenavid using the cement-panels pre-fab system developed by Servivienda (Lizarralde, 2004).
- i. Turkey, Marmara region: Study conducted by Cassidy Johnson and published in Johnson et al. (2005) and in Davidson et al (2006). Post 1999 earthquake temporary housing reconstruction in the Marmara region. Directed by the Ministry of Public Works and Settlements, 32,000 temporary units were built by private contractors within 5 five months and 41,000 permanent units were built within 3 years.
- j. Emergency shelter proposed by Architect Nader Khalili After finding similar patterns in built projects, we compared this pattern with the famous emergency shelter domes proposed by Khalili (as explained in Stevenson, 2004). According to Stevenson, these domes were originally inspired by shelters to be built in the moon; they are to be built with spiral layers of plastic bags filled with earth.

RESEARCH RESULTS

The research looked for common patterns; these concern:

1. flexible use of enclosed and open space,
2. combination of one, two and three storey units,
3. priority to interior comfort and quality of the interior spaces with limited interior subdivisions,
4. unclear distinction between original core and later additions/modifications,
5. unclear distinction between temporary units and permanent houses; progressive approach with quick first construction and no clear end,
6. no uniformity in façade; variety of textures and colours,
7. great variety between housing units,
8. intensive use of recycled materials and components,
9. combination of different materials and technologies; progression from 'light' to solid technologies,
10. variety of functions and uses, mixture of residence and income-generation activities,
11. strong emphasis on safety from theft and robbery; delimitation of the land and fencing is a priority,
12. variety of open spaces,
13. hierarchy of streets and paths,
14. variety of plot sizes and forms.

Table 1 summarizes the patterns found and the six categories in which they were classified. It shows the occurrence of those patterns in the selected case studies. "Y" means that the pattern occurs in the example, "N" means that the pattern does not occur and "na" means that the pattern is not pertinent or cannot be identified with the information available. Table 2 compares the form in which the fourteen patterns occur in spontaneous settlements and in post-disaster (formal) projects.

Patterns related to housing form:

1. Spontaneous housing translates a great variety of domestic activities in the mixed use of indoor, outdoor, enclosed, open and semi-open spaces. Income generation activities, children's baths, laundry, eating, playing and a great variety of social activities occur very often in semi-open or enclosed (but not roofed) spaces outside of the house. Particularly in warm climates, a great integration of indoor and outdoor spaces facilitates the development of these activities. Spaces delimited by walls but without roofs and by roofs without walls help the development of these activities. In the informal sector, the projection of domestic activities outdoors helps reducing the built (roofed and enclosed) area, thus reducing construction costs. Formal solutions often make a clear distinction between interior domestic activities and the "outside". This lack of integration between indoor spaces and the exterior creates what we call the "box effect": users are inside or outside of the box with little options in between (see Fig. 1 and Fig. 3).



Fig. 1. Left: Interior of a spontaneous unit in Armenia, Colombia. Despite that the unit is built on illegally occupied land, the interior demonstrates the care for comfort and quality of space. **Right:** unit in Choluteca, Honduras. The design dramatically separates indoor and outdoor space creating "the box-effect".

2. The informal sector takes full advantage of housing evolution. Informal units grow over time following the availability of resources and the family needs (see Fig. 2). When units are erected on small plots (increasing affordability) later additions require the construction of a second level. Informal settlements in Bogotá, Colombia, might include 3, 4 and 5-storey units built on 6m-wide lots. On the other hand, formal reconstruction tends to follow a 1-storey pattern, a type that is associated with ease of construction and efficiency for mass production through mutual aid programs targeted to unskilled labour.

3. Even in cases where the exterior facades of informal housing seem 'unfinished and dilapidated' (by formal standards), the interior of informal units frequently demonstrates the particular care put into interior comfort and quality of indoor spaces (see Fig. 1). Sometimes equipped with TVs, DVD players, stereos and refrigerators, these interior spaces tend to have minimum subdivisions and to

serve various uses during the day. Following conventional “western” standards, formal units demonstrate an effort to classify and subdivide interior spaces, thus bedrooms, kitchens and living rooms are separated. This can be seen as an effort to prioritize “conventional” standards of functionality over the informal flexible notions of comfort.



Fig. 2. Left: Informal settlement in Bogotá showing 4 different stages in the housing evolution process: from a shack made of scrap wood to a three storey unit made of concrete and masonry. **Right:** 1-storey units in El Cantarito. Despite that higher densities were obtained and infrastructure was provided, few months after the project was finished, users had already modified the rigorously standardized facades to personalize them with colours and finishes.

Patterns related to housing evolution:

4. In the progressive evolution of informal units, the original core and later additions and modifications tend to merge into a unified unit. The use of light materials (wood and corrugated iron sheets) and recycled components plays a fundamental role in the flexibility of the units. Formal solutions, on the contrary, rarely anticipate later modifications and additions, reducing the possibilities of properly articulating them to the original core. Underestimating the importance of housing evolution leads to the need to later demolish brick walls or concrete slabs and reduces the possibilities of having structurally-sound joints between the core and the additions. Despite that they use a non-traditional technology, Khalili’s domes do not escape from many of the traditional patterns of the formal sector: the use of one or minimum materials and technologies, unification in the facades, clear distinction between indoor and outdoor spaces, little articulation between the core and later modifications, etc. (see Fig. 4).

5. In the progressive evolution of informal units, the temporary shelter - frequently used for land invasion in the early stages of the settlement - is smoothly transformed into a permanent or “solid” solution. This evolution brings affordability for the majority, for an improvised shelter (illegally built overnight) can become a house in the lapse of few years (see Fig. 3). Despite the fact that this pattern is found in almost every informal settlement in developing countries (Ferguson and Navarrete, 2003), formal reconstruction still follows a 2 or 3-step process in which

temporary, transitory and permanent sheltering are dramatically separated, usually provided by different bodies and usually using uncoordinated products.

Timescales also differ in the formal and informal sectors. In order to succeed in the illegal occupation of land, very often the informal sector relies on quick construction through the use of improvised units made of recycled and unfinished materials. These units act as “seeds” that are then improved upon over long periods of time; in other words, these constructions do not follow the traditional definition of a project, with clear beginning and a clear end, that is to say with a limited duration, typical of the formal sector.



Fig. 3. Left: Informal dwelling in Bogotá. The progressive improvement in materials and technologies increase the value of the property (the sign reads: “on sale”). **Right:** Free standing unit in La Paz, El Salvador, characterized by the box-effect and four-façade uniformity in technology and materials.

Patterns related to aesthetic principles:

6. Despite of common misconceptions about informal settlements, they usually are a tangible proof of the importance that low-income residents attach to the aesthetic appearance of their homes. The use of vibrant colours, façade decoration, and careful choice of textures demonstrate that not everything in informal sectors is about lack of choices. The formal solutions for reconstruction favour the opposite strategy for aesthetics and cost reduction, opting for homogeneous facades with minimum variety of materials, finishes and colours (see Fig. 2).

7. Variety in housing forms, sizes, finishes and technologies is an important strategy for cost-reduction in the informal housing sector. This allows every family to have – at each stage over time – exactly the amount of invested capital it can afford. In this way, each household slowly evolves at its own pace from rough and precarious materials to more expensive finishes. This becomes a powerful way of personalizing each of the units incidentally allowing visitors to discover something different in every shelter. By adopting the opposite approach, the formal reconstruction sector emphasizes uniformity among housing units in order to guarantee equality in the distribution of resources and to reduce costs through mass production. Before residents actually personalize their units with colours and modifications, this formal approach often builds boring rubber-stamp settlements

that “advertise” the poverty of beneficiaries and that contradict the basic notion that every single family is different.

Patterns related to the use of materials:

8. As we previously explained, the recycling of materials and construction components is one of the most efficient cost-reduction strategies adopted by the informal sector. It is therefore not rare to find an aluminium window, a ceramic toilet, an industrial truss or a pre-fab kitchen counter in a spontaneous shelter. This reuse of components saves energy and capital to households, allowing them at the same time to increase the value of their property. It is always surprising that despite the fact that disasters rarely completely destroy all the components and materials of the affected houses, very little recycling is applied to post-disaster reconstruction strategies. This is probably due to the fact that governments and NGOs feel uncomfortable with allowing exceptions to construction standards.

9. The combination of construction technologies (masonry, pre-fab panels, concrete, etc) is also an important solution for cost reduction in the informal sector. This variety allows each family to progressively invest capital in their house and to increase its value over later modifications only at the pace that additional resources become available. Besides, very often ‘light’ technologies such as timber frame and corrugated metal sheets are slowly replaced by ‘solid’ technologies such as masonry and concrete structures. On the contrary, minimum variety in construction technologies is adopted in formal reconstruction. Once again, standardization and uniformity are prioritized over variety and individual multiplicity of choice.

Patterns related to functionality:

10. Informal housing solutions in various parts of Colombia and South Africa confirm a pattern found by Kellet and Tipple (2000) and Bhatt and Rybczynski (1999) in spontaneous settlements in India, namely the inseparable interdependence of domestic and income generation activities in low-cost housing. During the day, spaces might change their use and thus, domestic spaces might serve for storage, workshops, stores or small manufacturing in the informal sector (see Fig. 4 and 5). The interdependence of their activities facilitates both housing affordability and income generation to households. Very often this is the only choice of production for women that need also to take care of children and domestic chores. All of this is often neglected in formal reconstruction projects that artificially distinguish between commercial and residential uses. This distinction is worsened by the “box effect” (pattern 1a) that limits the possibilities of interaction between the interior and the exterior. In the informal solutions, the possible link between indoor and indoor-outdoor spaces and the street is crucial for the delivery of services (ironing, clothes repairs, haircutting, etc) and for the productivity of stores and retail (see Fig. 5).

11. The widespread use of bars for windows and doors, fences around the plot and locks demonstrates the importance that informal dwellers give to prevention of theft, robbery and break ins. The common use of exterior fencing or even low walls is also interpreted sometimes as an effort to clearly delimit the acquired property. These priorities are rarely considered in the initial core of formal housing reconstruction. It is therefore not surprising that four years after the post-Mitch project was finished in Choluteca (Honduras), the majority of modifications to original cores were related to plot security and delimitation of land (Lizarralde and Boucher, 2004).

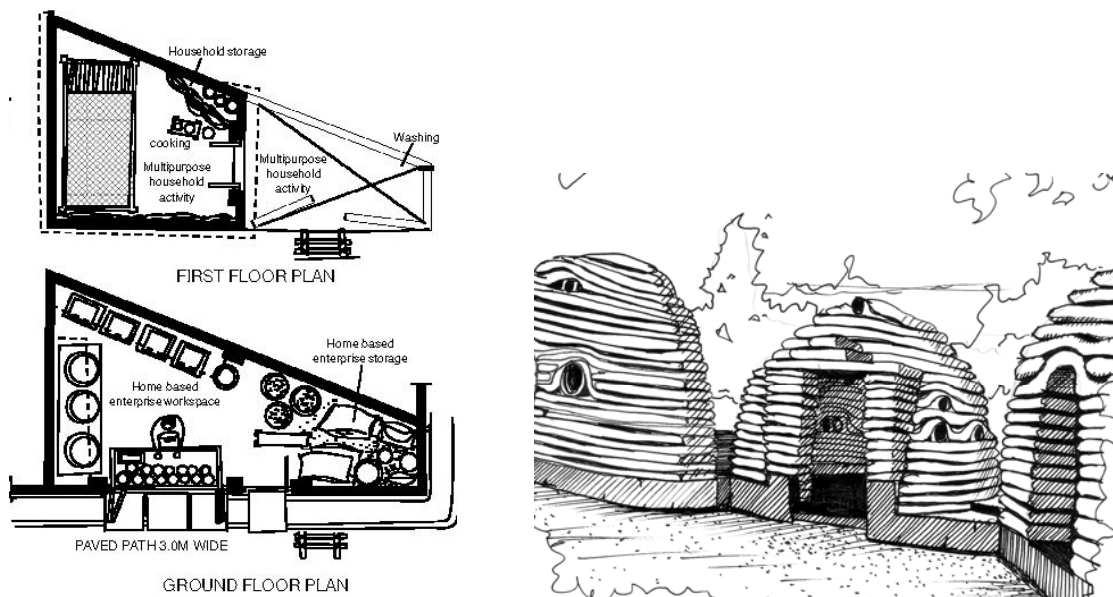


Fig. 4. Left: Example provided by Kellett and Tipple (2000) of a 2-storey spontaneous home and workplace in New Delhi. **Right:** Image of Khalili's post-disaster domes (drawn after images presented in Stevenson, 2004).

Patterns related to settlement layout:

12. Spontaneous housing is frequently developed around a great variety of open spaces that include small plazas, irregular squares and open areas in between units. These public or semi-public spaces play a fundamental role in community building and in social interactions between residents. It is therefore not rare to find in informal settlements a cluster of units around an open area (featured by a tree, a water tank, a shaded area or a parking place). In the settlement layout, these open areas vary in importance and functionality providing multiplicity of interactions between dwellers. Post-disaster formal solutions distribute housing units among a standardized pattern of streets. Public spaces provided in Nueva Choluteca (Honduras) consist of large public parks, but very little attention was paid to small-scale clustering of units (Lizarralde and Boucher, 2004).

13. As much as public spaces for social interaction, streets and paths in informal settlements also follow a hierarchy of different widths, finishes and public

importance (see Fig. 5). Narrow streets and paths that might not provide access to cars are land-efficient and also serve for the ventilation and lighting of the units. In many cases, narrow alleys also permit to have double access to the units, which is particularly useful for units that combine residence and income generation activities or for units that house an extended family, for example by giving an independent access to the family of the married children. In case of insufficient land availability, this solution permits increasing densities and therefore allows more affordable solutions for the majority. Higher densities also help reduce infrastructure costs (for building and maintenance) and consolidate the settlement as a whole. Even when resources are extremely scarce, formal standards of infrastructure (wide roads accessible to vehicles, sidewalks separated from the street, double-lane roads, etc) frequently influence post-disaster reconstruction projects challenging densities and thus challenging the long-term sustainability of infrastructure and public services.

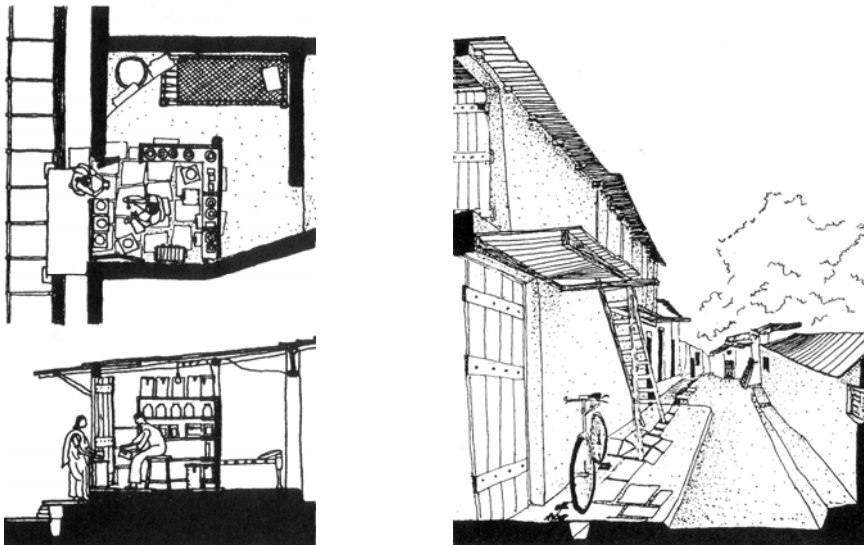


Fig. 5. Left and Right: Images of informal housing in Indore, India as published by “How the other half builds” (Bhatt and Rybczynski, 2005). The images show the combination of domestic and commercial activities and the use of narrow streets.

14. In the informal sector, an increased variety of plot sizes and forms permits that families of different sizes and with different incomes can afford a housing product that closely accommodates their own needs and possibilities. This feature is often ignored in formal reconstruction projects in which standardization of products and services (including lot sizes and forms) predominates over variety of choice.

Table 1. Occurrence of patterns in the settlements studied.

Category	Patterns	Spontaneous housing				Post-disaster projects					
		a. Colomb.	b. Cape T.	c. Indore,	d. New-D	e. Hond.	f. Salvad.	g. El Cant.	h. Calarca	i. Turkey	j. Khalili
Housing form	1. Flexible use of enclosed and open spaces	Y	Y	Y	Y	N	N	Y	Y	N	N
	2. Combination of one, two and three storey units	Y	Y	Y	Y	N	N	N	N	N	N
	3. Priority to interior comfort and quality of the interior spaces with limited interior subdivisions	Y	Y	Y	Y	N	N	N	N	Y	Y
Housing evolution	4. Unclear distinction between original core and later additions/modifications	Y	Y	Y	Y	N	N	N	N	N	N
	5. Unclear distinction between temporary units and permanent houses. Progressive approach with quick first construction and no clear end.	Y	Y	Y	Y	N	N	N	N	N	Y
Aesthetic principles	6. No uniformity in façade. Variety of textures and colours	Y	Y	Y	na	N	N	N	N	N	N
	7. Great variety between housing units	Y	Y	Y	Y	N	N	N	N	N	Y
Materials	8. Intensive use of recycled materials and components	Y	Y	Y	na	N	N	N	N	N	N
	9. Combination of different materials and technologies. Progression from 'light' to solid technologies.	Y	Y	Y	Y	N	N	N	N	N	N
Function/ty	10. Variety of functions and uses. Mixture of residence and income-generation activities	Y	Y	Y	Y	N	N	N	N	N	Y
	11. Strong emphasis on safety from theft and robbery. Delimitation of the land and fencing is a priority	Y	Y	na	na	N	N	N	N	N	na
Settlement layout	12. Variety of open spaces	Y	Y	Y	na	N	na	N	N	N	na
	13. Hierarchy of streets and paths	Y	Y	Y	na	N	N	Y	N	N	na
	14. Variety of plot sizes and forms	Y	Y	Y	Y	N	N	N	N	N	na

Table 2. Comparison of the patterns found in spontaneous housing and in post-disaster (formal) projects

Patterns in spontaneous housing	Patterns in post-disaster projects
1. Flexible use of enclosed and open spaces	1. Box effect: clear distinction between indoors and outdoors
2. Combination of one, two and three storey units	2. Exclusivity of one-storey units
3. Priority to interior comfort and quality of the interior spaces with limited interior subdivisions	3. Subdivided layouts and clear subdivisions of spaces
4. Unclear distinction between original core and later additions/modifications	4. Lack of coordination between original core and later additions or modifications
5. Unclear distinction between temporary units and permanent houses. Progressive approach with quick first construction and no clear end.	5. Clear distinction between temporary units and permanent houses. 2 or 3-step approach, Project with clear end.
6. No uniformity in façade. Variety of textures and colours	6. Great attention to façade uniformity, finishes and colours
7. Great variety between housing units	7. Uniformity and standardization between housing units
8. Intensive use of recycled materials and components	8. Little use of recycled materials and components
9. Combination of different materials and technologies. Progression from 'light' to solid technologies.	9. Uniformity in the use of materials and technologies
10. Variety of functions and uses. Mixture of residence and income-generation activities	10. Clear distinction of uses. Oriented towards residential use
11. Strong emphasis on safety from theft and robbery. Delimitation of the land and fencing is a priority.	11. Strong emphasis on structural safety. Delimitation of land and fencing is not a priority
12. Variety of open spaces	12. Uniformity in open spaces
13. Hierarchy of streets and paths	13. Homogeneity in streets and paths
14. Variety of plot sizes and forms	14. Uniformity of plot sizes and forms

CONCLUSIONS

1. Despite contextual differences, various common patterns can be identified among spontaneous housing solutions and also, but differently, among post-disaster reconstruction projects. This might be surprising if one considers that housing is largely affected by contextual characteristics. However, it also confirms the notion that despite the fact that no two final products are equal, a number of restraining process variables exists in the informal housing process.

2. The (formal) post-disaster reconstruction projects studied do not follow the same priorities and patterns found in the spontaneous settlements used for the study. This means that the hypothesis proposed is true. Even though this does not permit one to argue that the projects do not respond to the priorities of their local beneficiaries, it raises the question about the sensitivity of the projects towards common solutions used in the informal sector to produce affordable shelter for the poor.

3. Housing construction in the informal sector does not follow the traditional definition of a project in the formal sector (an enterprise developed within a clear beginning and a clear end). In the case of illegal occupation of land, the building appears rather suddenly and is only finished over long periods of time so that the “project” does not really have a clear end.

4. One of the main differences between spontaneous (informal) construction and professionally-designed (formal) projects is the strategies used for reducing costs and increase affordability. The formal reconstruction sector emphasizes standardization and uniformity in materials, forms, sizes, technologies and layouts (at both the level of the house and the lot). On the other hand, spontaneous settlements demonstrate that the informal sector relies on, and takes full advantage of: (i) recycling of used components; (ii) progressive construction; (iii) variety of house sizes and forms, (iv) variety of plot sizes and forms, according to different economic possibilities of each household; and (iv) combination of residential use with income-generation activities.

5. The use of recycled materials, the use of light technologies (timber, corrugated metal sheets, etc) and the acceptance of housing *evolution* contribute to the speed of construction of spontaneous settlements. Many of these aspects are often neglected in formal post-disaster projects, suggesting that it might be prudent to start “learning from the poor”.

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