TRANSITION FROM SHELTER TO HOME

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Abstract: This paper focuses on the process of transition from temporary accommodation to permanent housing after disasters. The magnitude of some disasters results in a shortage of housing that cannot be covered by the regular building industry and durable accommodation cannot be achieved in the short-term. Sheltering during this period can be provided through different approaches, such as transitional shelter. When this approach is used, families remain in a condition of temporariness and uncertainty until they reach a permanent solution. Because the process of building durable accommodation can take years, transitional shelters are changed by families over time in order to meet their needs. Cases of transitional accommodation provided by the Government and TECHO NGO in Chile and Peru are analysed to illustrate how families modify their houses. Cases studied show similar characteristics in the way families expand and modify their shelters focusing on creating a 'home' even in a temporary situation.

Introduction

Short-term housing solutions on a massive scale are needed when disasters of magnitude result in a shortage of housing (Table 1) and the local building industry cannot cover the shortfall (IFRC, 2011, p.4). Under these circumstances, communities affected achieve shelter in different ways, such as rebuilding themselves supported by local government or external institutions, receiving shelter solutions by the government, national or international organisations, or getting a solution from a combination of the above. Responses are diverse and particular to each case; nevertheless, some practices are repeated such as the use of large structures as collective shelters, temporary camps, rented houses, repair of damaged houses, and transitional shelters, among others (Shelter Centre, 2012, pp. 4-5).

Table 1. Houses destroyed and t-shelters

(1) American Red Cross and National Association of Home Builders, 2006; (2) FEMA, 2010; (3)(4) Gobierno del Perú, 2008; (5) UNDP; (6) FAFO and CASTED, 2012; (7) and (8) IFRC/EPYPS, 2011 (9) and (10) Gobierno de Chile, 2014; (11) and (12) IFRC, UN-HABITAT and UNHCR, 2013.

Disaster event	Approx. nº of destroyed houses	Approx. nº of t-shelters/ temporary homes built
US, Hurricane Katrina 2005	352,930 (1)	92,000 (2)
Peru, Ica Earthquake 2007	52,154 (3)	15,000 (4)
China, Sichuan Earthquake 2008	6,500,000 (5)	677,000 (6)
Haiti, Earthquake 2010	188,383 (7)	125,000 (8)
Chile, Earthquake and tsunami 2010	222,000 (9)	70,489 (10)
Japan, Earthquake and tsunami 2011	390,000 (11)	54,000 (12)

Transitional shelter is needed when families affected are unable or unwilling to return to their pre-disaster houses or land (The Sphere Project, 2011, p. 244). Although the terms temporary and transitional have been used to refer to both, the process and the building solution, they have some conceptual differences. 'Temporary' refers to a building that will be used a defined lapse of time and 'Transitional' refers to a process between two stages. 'Transitional Shelter' also known as 'T-Shelter' has been adopted as common term by the humanitarian organisations since the 2004 Ocean Indian Tsunami (Shelter Centre, 2012, p.xvi). A variety of solutions such as prefab structures, semi-permanent shelters and core housing, have been grouped under the 'Transitional Shelter' name, but some of them do not

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fulfil the definition of the humanitarian sector which considers it as an approach. This approach aims to provide a shelter solution that can be reused later in more permanent structures, and therefore can be upgraded, expanded, relocated (The Sphere Project, 2011, p. 252). However, it is a complex task to design a solution that fits those characteristics.

Recent experiences have shown that in some cases resources used in transitional shelters have hindered the recovery and increased vulnerabilities instead of supporting the process. Haiti has been presented as an example, because the original T-Shelter design was modified in order to acknowledge wind resistance and seismic parameters (IFRC/ EPYPSA, 2011, pp. 21-22, 27). The improved shelter evolved into a more long-lasting expensive solution (from 1,500 USD to 2,300-4,300 USD) with longer delivery time and the same footage area, therefore not a cost-effective solution in comparison to the permanent housing approach (IFRC/ EPYPSA, 2011, pp. 21-22, 27). Nevertheless, other approaches such as core houses and cash vouchers are not always feasible for various reasons, and transitional shelter is the only available alternative in some cases (IFRC, 2011, p.4). In those situations, transitional shelters and pre-designed solutions can help *'to provide the required structural integrity and disaster resistance, but adaptable in both materials and the technologies used to enable the affected households to 'transition' into a more durable home'* (IFRC, 2011, p.4).

Achieving a durable solution or permanent house can take years for families affected due to diverse reasons such as the cost and difficulty of debris' removal, land tenure, lack of accessible land or materials, among others. Hence, small transitional shelters become the only available place to live during the recovery process for some affected communities. Hence, they modify their shelters in order to meet their needs, and these changes are defined by their resources, capacities, status and security of tenure (IFRC, 2011, p.4). These modifications can improve the quality of the transitional house, but can also rebuild vulnerabilities due to lack of supervision and technical knowledge. Examples of modified shelters can be seen in different contexts, such as Indonesia, even when the design of the shelter does not consider future modifications (Ikaputra, 2008; Rachmamarcillia and Ohno, 2012). On the other hand, some solutions have been designed to be modified and moved, such as the case of shelters based in frames in Indonesia, Pakistan, Peru, Haiti and Vietnam (IFRC, 2011). In order to understand the process of recovery and modification of transitional shelters from first-hand, fieldwork was conducted in Chile and Peru in 2012.

Adapted shelters: case studies in Peru and Chile. Methodology

Peru and Chile are located in the so-called "Ring of Fire" region, an area with one of the highest seismic activities in the world. Both countries are placed in the convergence between the Nazca Oceanic Plate and South American Continental Plate, corresponding to the subduction zones along the coasts of the Pacific Ocean (Cardenas, 2013; Edwards, 2003). Therefore, they have faced great magnitude earthquakes throughout their history and it is likely that they will face them again. Although they share a history of repeated disasters and they are neighbour countries, they have also important differences, such as different climate conditions, local architecture and building materials. Despite these differences the same predesigned solution was used in both countries after recent disasters due to the need for sheltering on a massive scale in a short period of time. The model used was a shack built with prefabricated timber panels and assembled on site by volunteers with simple tools, known locally as *mediagua* (Figure 1). This transitional shelter model has been used all over Latin America by TECHO (roof) NGO, with slight differences in the design. TECHO is an organisation that works in Latin America and the Caribbean, which looks to overcome poverty in developing countries. Although TECHO focuses on development instead of disaster recovery, the organisation has built transitional houses in different Latin-American countries after disaster events. Therefore the shelter solution used by TECHO was selected as case study, in order to compare the transformations over the same model in different countries.

Figure 1. Non-modified transitional house in Peru after 5 years of use provided by TECHO. (Wagemann)

Case studies were analised in order to understand the process of recovery that families face after a disaster. The aim was to identify steps, similarities and differences in the process from temporary to permanent housing. Chile and Peru were selected based on the occurrence of a disaster with large impact in the past years; the use of the transitional shelter approach with the same mode in different climatic zones; and the differences on the type of land right situation (displaced and non-displaced communities).

Three questions guided the study of the cases: 1) How families modify their temporary shelters and why they do it? 2) What are the characteristics of the process? And 3) what features are essential for supporting the process of transition? From field observation became clear that most transitional shelters were modified throughout the years, and therefore one of the challenges was to recognise the houses after years of use, in order to select the cases to compare (Figure 2). Because the cases where difficult to locate, the method used to find the houses was to visit the places in company of a representative of the government or the organisation that provided the shelters, to identify houses to study and members of the community that could collaborate in searching of a variety of different modified houses.

Figure 2. Example of a modified transitional house in Dichato, Chile, 2012. (Wagemann)

In total, ten settlements were visited and twenty seven houses were analysed. In order to see diverse houses improvements, the selection was based on few cases from different settlements rather than several cases from one settlement. Therefore, a diverse range of cases were selected, which show a variety of situations from different geographical areas, using the same transitional house which has been modified by users. The analysis contributes to clarify how and why specific cultural and environmental factors affect the adaptation of these houses. Although these cases are not necessarily representative of transitional houses in other countries, they provide empirical information about how people improve their transitional solutions, and therefore, they can illuminate ideas for future designs.

Combined tactics for data collection were used to produce a visual description of the process of modification throughout the years. These tactics were: face-to-face semi-structured interviews with residents; artefactual survey of the houses (materials, dimensions, process of construction, and costs); structured observation of artefacts; drawings and photographs made on site; and archival documents (reports, journals, and public documents). Based on the information gathered during fieldwork, drawings of the houses were made on the same scale. The comparison shows the process of adaptation in three periods: Stage 1 (when the transitional house was built), Stage 2 (in the middle of the process); and Stage 3 (when the house was visited). The analytical themes used for comparison were: dimension and expansion (m2); type of changes (materials and use of the space); water and sanitation (if they were added or not to the house); family size; and adaptation to the climate (such as insulation, waterproofing, ventilation).

Case studies in Peru

On the 15th of August 2007, the province of Ica in Peru was hit by an earthquake of magnitude 8.0. The earthquake killed 593 people, left homeless 319,886, and the most damaged cities were Chincha Alta, Ica and Pisco (Ministerio de Vivienda, Construccion y Saneamiento, 2008, p.7). In terms of housing, 140,338 houses were affected from which 52,154 were destroyed and 23,632 were severely affected, accounting together 75,786 units declared uninhabitable (Ministerio de Vivienda, Construccion y Saneamiento, 2008, p.8). Some factors that contributed to the severity of the damage were the location of buildings in vulnerable areas, precariousness of housing construction, informality and consequent poor construction practices such as lack of professionals in the design, lack of supervision, lack of compliance with regulations of design and construction (Ministerio de Vivienda, Construccion y Saneamiento, 2008, p.9-11). The majority of damaged buildings were those built in clay and brick masonry structures, however, several reinforced concrete structures also suffered major damage or collapsed (Kwon, 2008, p.1).

After the earthquake, around 15,000 transitional housing solutions were built (Ministerio de Vivienda, Construccion y Saneamiento, 2008, p.16). International NGOs had an important presence in this country, and therefore different types of shelters were provided by them. TECHO built around an 8% of the transitional shelters in the affected zones (interview, TECHO-Peru, 2012), and the Government of Peru around a 10% of the transitional solutions (Ministerio de Vivienda, Construccion y Saneamiento, 2008, p.16). The work of TECHO was mainly for supporting villages in the surroundings of the main cities called *centros poblados*. Most of these villages are connected to the main cities, but they had fewer possibilities of being assisted by other international organisations because they are dispersed in the region. The *centros poblados* selected for analysis were chosen with the aim of studying transitional solutions in villages of different scale. Therefore, houses in bigger settlements such as Bernales (Pisco) and Santa Rosa (Chincha) were analysed, alongside with examples from small *centros poblados* that comprise only a couple of streets (Caucato, Mensía, and El Palmar in Pisco, and Cañapay in Chincha).

Fifteen modified houses were selected for analysis and drawn at the same scale for comparing their evolution (Figure 3). In the comparison it was possible to identify repetition and similar changes. Firstly, most families removed flooring panels for being used in extensions. This change was generally done early in the process, meaning that families considered more important to have a bigger space rather than a timber floor. Apparently for residents it was an easy and not expensive task to build a thin concrete slab. Secondly, one of the early additions was an intermediate shaded space connecting public and private spaces, like a terrace or front porch. Porches analysed were built with matting of woven bamboo or similar material, frequently used in the area. Thirdly, the transitional house was not seen as a disposable. Once families achieved the permanent solution, the entire shelter or some parts of it were used as an extension or first floor. Transitional houses were recycled and reused because the families saw it as an investment, an endowment, and also as an object loaded with emotions and memories. Some families commented during the interview the importance of the shelter during the recovery, and therefore their attachment to the house.

Practices identified could lead to future problems although to future improvements too. When the flooring panels are removed, the structure of the house is weakened. The house is destabilised because the wall panels are attached to the floor, and floor panels work as bracing in the structural system. Therefore, a design question arises: how to remove the floor panels without weaken the structural strength of the house? An initial solution would be to design a structure based on frames rather than panels. Another issue is the addition of a ventilated shaded space in front of the house. Porches or terraces were seen in traditional constructions as well as in the improvements made to the transitional house. This local practice is used for ventilating and cooling the house. Moreover, the shaded porch has a cultural and social role associated; it is a place for social interaction within neighbours. Bearing in mind these aspects, the resources used for flooring panels could be used for building the intermediate space, and therefore, meet some basic conditions for living in this region.

Case studies in Chile

Chile is one of the seismically most active countries in the world, with one earthquake above magnitude 8.0 Richter every ten years approximately (Cardenas, 2013, p.1). The 27th of February of 2010 an earthquake of magnitude 8.8 Richter and a following tsunami hit the central and southern Chile. The earthquake affected around the 75% of the country population, killing 526 people and leaving more than 222,000 houses destroyed or seriously damaged (Gobierno de Chile, 2014, pp. 8,18). In total 70,489 transitional houses were built after the disaster (Gobierno de Chile, 2014, p.28). Around 32% of these houses were built by TECHO and approximately 65% were built by the government of Chile (Gobierno de Chile, 2014, p.28). In both cases the solution used was the *mediagua*.

Displaced as well as non-displaced families with destroyed houses received transitional houses as mid-term solution. Families with destroyed houses that were able to stay in their own land or plot, remained in there, and received support from the government or TECHO. Due to the extensive devastation in coastal areas, families affected by the tsunami were displaced to temporary settlements. These settlements were called *aldeas* (villages) instead of *campamentos* (camps) which are locally known as informal settlements built before the earthquake. The *aldeas* were built on rented land or state owned land (Interview, Aldeas y Campamentos, Gobierno de Chile, 2012). In total 106 *aldeas* were built in 2010, 46 *aldeas* (1,442 families) were in use in February 2013 (Gobierno de Chile, 2013, p.14), and 393 families were still living in 12 *aldeas* in January 2014 (Gobierno de Chile, 2014, p.28).

The cases chosen for analysis were *aldeas* of the Bío-Bío and Maule regions, the areas most affected by the tsunami. Similar to the Peruvian case, the *aldeas* selected for analysis were chosen with the aim of studying the transitional shelters in settlements of different scale. The

aldeas visited in Bío-Bío region were Dichato and Coronel, and in Maule region were Pelluhue and Curanipe. The houses selected for analysis were drawn at the same scale and the same survey applied in Peru was applied to the families in Chile. Twelve illustrative cases were selected for doing the analysis and comparisons (Figure 3). Some recurrences appeared in the comparison of selected houses and from direct observation of the houses in the *aldeas*. Firstly, most families living in *aldeas* adapted their houses and attached more rooms to the transitional house. Secondly, all cases studied added insulation and a a waterproofing layer, showing that both protection from the rain and thermal comfort were crucial for coping with the winter. Thirdly, the fixed location of doors and windows was a problem for doing extensions, so new voids were made for connecting with additions and wall panels removed. Similarly, families added internal divisions to the house, separating the main space into two rooms for different uses (bedroom, kitchen, shop, etc.). Finally, half of the cases studied added a front porch, creating an intermediate space, a common feature in single-family dwellings in the cities and villages of the region.

Modifications seen can create some problems with the transitional houses, but like in the Peruvian cases, some possible solutions can arise for improvements in future designs. When wall panels are removed or voids are made cutting beams and columns of the panel frame, the structure of the house is weakened. Although the case of Chile is different to Peru because families should not reside in the *aldeas* permanently (they are meant to be temporary) the extensions seen were similar to the cases where the land is owned. Most of the Chilean families showed the intention of keeping the house and to use it as an extension in the future permanent house. Therefore, there is an opportunity to make a more flexible design and to show families how to use the parts of the house efficiently. In addition, insulation and waterproofing were core issues for the families, and therefore these aspects should be included when giving a transitional housing solution for climates with a cold winter, such as the South of Chile.

Sheltering is a continuous process to create a home. Conclusion

Three similar types of changes were identified in the modifications on shelters:

- Expansion: due to the need for space. These modifications frequently weaken the structure and expose families to imminent hazards.
- Climate Adaptation: to deal with climate, face the hot summer and cold winter. These changes not necessarily weaken the structure, but they added resources and effort from families, NGOs and governments, in order to adapt an inappropriate design.
- Introduction of local traditions: such as front porches and intermediate spaces. They do not weaken the structure, but having them from the beginning can help families to have a sense of normalcy and familiarity during the recovery.

A difference between the Peruvian and Chilean cases is that the *aldeas* in Chile are used temporarily by displaced families, and therefore, residents know they will be evicted from the site in the following months or years. Nevertheless, most transitional houses built in those *aldeas* were extensively modified. The modifications show that the need for space and for making the house a ‘home’ is evident, even when families know the houses will be disassembled, moved, and even disposed. In some cases in both countries, the changes were so extreme that it was difficult to identify the transitional solution. Most families added new intermediate spaces, and even some houses were used as shops, changing the initial use of the shelter. Furthermore, each country reflects its own culture in the house, such as the way families set up the furniture, how and where to cook, and how the houses are connected to the public spaces.

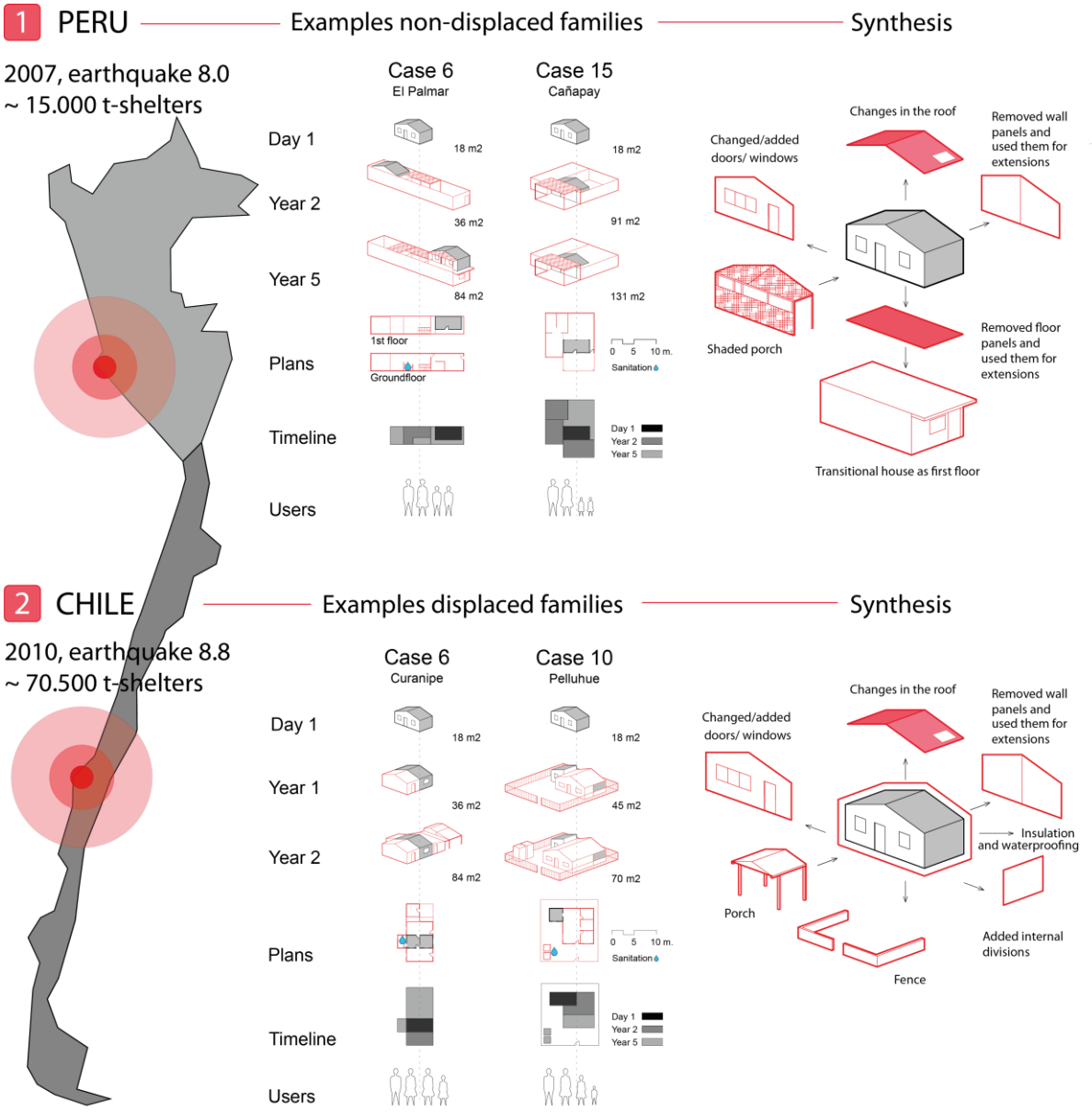

Figure 3. Synthesis of modified transitional houses studied during fieldwork conducted in Chile (displaced families) and Peru (non-displaced families) in 2012. (Wagemann)

The analysis of these cases is the basis for designing new strategies, focusing on the concepts of flexibility, adaptation and self-build processes. As it is pointed out in the Transitional Shelter Guidelines the shelter should have the potential of being: upgraded, reused, relocated, resold, and recycled (Shelter Centre, 2012, p.2). Nevertheless, transitional shelters used in practice, such the model analysed, are not made for being upgraded, even though most families do it. Changes made to the transitional house, to become a permanent solution or to form part of it, can compromise the overall structure, making families affected to enter in the cycle of vulnerability again. In cases analysed it was seen that NGOs and governments have invested resources on the improvement of transitional shelters that themselves have built, improvements that were crucial for the families to achieve a minimum quality life during the recovery process (shading, insulation, waterproofing, and sanitation, among others). Therefore, to recognise the existing needs of the affected population and the sheltering process as a continuum is central to giving effective solutions in a disaster context.

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