



## Temporary housing after disasters: A state of the art survey



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### A B S T R A C T

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The number of natural disasters has drastically increased, causing great damages on buildings. Large amount of houses have suffered damages and become unusable, causing a high number of homeless people. Housing reconstruction programmes play a decisive role on the disaster recovery and providing temporary housing is a crucial step of these programmes. During the reconstruction of permanent housing, it allows victims to have a private and secure place to return to their normal life. It has been widely used after the largest scale disasters but it has also been greatly criticized, mainly for being unsustainable and culturally inadequate. The study aims to present a state-of-the-art survey on the topic, as well as to identify the main problems, their origin and the existing proposals to avoid them. The research also proposes some guidelines that can reduce the effects of those problems.

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### Introduction

The questions about temporary housing after disasters still have an ample discussion in the scientific domain.

The number of natural disasters has drastically increased in the last decades, having a considerable impact on the built environment. Most of the buildings suffer extensive damages, many of them collapse entirely, and the destruction of houses is one of the most visible effects of a disaster, causing high numbers of homeless people.

It is widely accepted that in order to bring back the livelihoods of the affected communities, the reconstruction programme should start as soon as possible (United Nations Disaster Relief Co-Ordinator – UNDR0, 1982). Housing provision plays a crucial role on those programs since it is one of the most important needs for people and essential for their well-being (Barakat, 2003). A house is a space for people to live in, providing conditions for family life, comfort, protection and privacy. After a disaster the needs for housing should have a quick response because losing a house is more than a physical deprivation, it is losing dignity, identity and privacy (Barakat, 2003).

Providing a house is a fundamental step to establish some sense of normalcy in the life of the affected community, as well as to prevent the rising of deaths and the spread of diseases, increasing

conditions to personal hygiene and giving protection against external factors like weather. Post-disaster housing provides privacy, protection and better health conditions for victims, which are decisive requirements to start a recovery and reconstruction programme after a disaster.

However, post-disaster scenarios have all the factors to produce inadequate solutions, mainly due to the need for a rapid and large-scale action under chaotic conditions (Davidson, Lizarralde, & Johnson, 2008), and previous studies have presented many problems related to post-disaster housing (Hidayat & Egbu, 2010). As a consequence, very often post-disaster housing solutions fail their objectives (Barakat, 2003; Kronenburg, 2009; Lizarralde & Davidson, 2006; Twigg, 2006).

Post-disaster reconstruction is a complex process and providing temporary housing seems to be one of the most decisive tasks since it allows conditions for people to progressively return to normal life. It has been used after the most large-scale disasters, but in the same way it has been criticized for being unsustainable and culturally inadequate.

This study aims to present a state-of-the-art survey on the topic of temporary housing after disasters, identifying the main problems and the possible solutions that have been proposed. It also intends to propose some guidelines that can contribute for the improvement of future post-disaster temporary housing solutions.

### What is temporary housing after disasters

The definition of temporary housing is not a simple issue. According to UNDR0 (1982), temporary housing is one of the eight

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basic types of post-disaster shelter provision. Considering temporary housing a shelter type, the classification proposed by UNDR0 seems to reflect what Quarantelli (1995) considers the variety of unclear and inconsistent ways the terms *shelter* and *housing* are used in disaster literature. Proposing a definition of four distinct stages of housing that may be employed in post-disaster situations, Quarantelli (1995) makes a distinction between *sheltering* and *housing*. While *sheltering* refers to a place to stay during the immediate aftermath of the disaster suspending daily activities, *housing* denotes the return to household responsibilities and daily routine (Johnson, 2002). Based on this distinction, the four stages are: (1) *emergency shelter* – a place where survivors stay for a short period of time during the height of the emergency, which can be in the house of a friend or in a public shelter; (2) *temporary shelter* – used for an expected short stay, ideally no more than a few weeks after the disaster, this may be a tent, a public mass shelter, etc.; (3) *temporary housing* – the place where the survivors can reside temporarily, usually planned for six months to three years, returning to their normal daily activities, and can take the form of a prefabricated house, a rented house, etc.; (4) *permanent housing* – return to the rebuilt house or resettle in a new one to live permanently.

This way, temporary housing can be defined as (1) an object, which means the physical structure people reside in after a disaster; (2) a part of the post-disaster re-housing programme; (3) a place that serves the function to shelter people during the period since the disaster occurs until they are resettled in a permanent place to live (Johnson, 2007a).

#### Importance of temporary housing

Following the concept of Quarantelli (1995), temporary housing is extremely important to recover after disasters, allowing people to return to their normal activities such as work, cooking, house-keeping, school, socializing, etc. (Arslan & Cosgun, 2008; Johnson, 2007a). People are protected in shelters but cannot resume daily life, and so it is impracticable to stay longer in them. Likewise, temporary shelters may rapidly decay due to the external factors, and the need to get people out of them in order to be replaced in more durable and resistant solutions also emphasizes the importance to provide temporary housing (Steinberg, 2007). Since reconstruction lasts long, there is a time gap that needs to be bridged over, and temporary housing seems to be the evident option (Johnson, Lizarralde, & Davidson, 2010). It is the moment when uncertainty is replaced by security, allowing families to regain the necessary tranquillity to reorganize their future. This way, temporary housing helps people to feel safe and to have a social recognition (Bedoya, 2004). Temporary housing is also crucial to promote the success of the overall reconstruction, since it allows adequate

time for proper community planning to reduce risk and increase sustainability for future construction (Johnson, 2008). Moreover, after a disaster it is crucial to provide temporary housing as soon as possible to offer a comfort level consistent with the common standard of living (Johnson, 2007a). This way, even in a temporary location, temporary housing is extremely important to promote the return to normalcy in a chaotic and uncertain situation after a disaster, being a necessary step in reconstruction programmes (Johnson, 2007b).

#### Different types of temporary housing solutions

Due to its importance, it has often been used after large-scale disasters by the formal temporary housing projects or top-down approaches, which means that units are provided by governments and non-governmental organisations (NGOs). Most of these solutions are prefabricated, mass-produced and standardized, and two main groups can be identified: ready-made units and kit supplies.

The ready-made units are housing solutions totally constructed in factory that just need to be transported to the site where they will be placed, see Fig. 1(a). Since these solutions usually involve complex transport systems, some projects try to simplify their transportation dividing the unit in a few parts to be quickly assembled on site, see Fig. 1(b).

Even so, those solutions are not easy to move to areas with difficult access and also need heavy transport systems, which is why many projects are developed based on kit solutions. The kit concept also tries to benefit from the advantages of prefabrication, but instead of producing finished units it produces the small elements that constitute the unit. The elements have to be assembled in place, thus sometimes the participation of local people in the construction or assembly process is possible, see Fig. 2. This way, kit solutions facilitates transportation and the local assembly, since the elements are small, light and easy to handle.

#### Problems with temporary housing solutions

In spite of being a way to promote successful reconstruction programs, allowing survivors to resume their life activities, temporary housing is also a controversial issue of disasters reconstruction and has received criticism mainly due to problems of sustainability and cultural inadequacy issues (Barakat, 2003; Hadafi & Fallahi, 2010; Johnson, 2007a, 2007b, 2008; UNDR0, 1982). A considerable part of post-disaster temporary housing programs have been unsustainable and culturally inadequate as a result of unsuccessful strategies, misunderstandings about users' real needs and misconceptions in dealing with local conditions and resources.



Fig. 1. Ready-made units: (a) temporary housing units ready to be transported (source: [www.katrinadestruction.com](http://www.katrinadestruction.com)), and (b) local assembly of units. Source: <http://exc.ysmr.com>.

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