Customisable Shelter Solutions:
A Case Study from Zaatari Refugee Camp

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Abstract

The population of people living in temporary settlements after disasters is in the millions and the average stay in these settlements exceeds a decade. Available temporary shelters solutions follow either a top down or bottom up system. This paper sets out to analyse the benefits and deficiencies of both systems, highlighting their limitations. The generic nature of refugee housing often does not adapt to the variety of cultures and individuals represented. We propose addressing these limitations with customisable and adaptable solutions. The benefits of such approach on the well-being of the displaced population are discussed. Using Zaatari refugee camp in Jordan as a case study we analyse the adaptability and potential for personalisation of typologies of temporary shelters for refugees used in the camp. Zaatari Refugee camp in Jordan is home to nearly 80,000 Syrian refugees, some of whom have been there since the camp opened on 29th July 2012. At the time of writing the residents of Zaatari will have been living in basic caravan shelters for up to 5 years. Over this time the majority of occupants have adapted and personalised their given shelters in order to regain a sense of normality. This is despite the fact the shelters provided were rigid in nature.

1. Introduction

The United Nations Refugee Agency (UNHCR) estimated that an unprecedented 65.6 Million people were displaced worldwide in 2018 due to conflicts alone [1]. Moreover, researchers predict that by 2050 there will be 200 million climate-induced refugees [2]. Unfortunately, these situations are not short term, more often than not, refugees and internally displaced people can end up living in displacement for years or even decades [3]. Temporary shelters are often used in mass displacement scenarios as a housing solution. The emphasise on temporariness of shelters is often the result host governments being reluctant to offer permanent settlement solutions for refugees. This means that the available temporary shelters are inadequate as a long term solution. In addition, social and cultural needs are rarely met, as the main drive is to house displaced populations and provide protection from the elements and basic amenities as quickly and cheaply as possible [4].

Temporary shelters come in two brands, top-down and bottom-up constructions. Top-down solutions consist usually of prefabricated, standardised and mass produced units provided by governments and non-governmental organisations (NGOs) [4]. Bottom-up solutions are built on site by the displaced populations or local workers using locally available materials under the supervision of local authorities or NGOs. Both solutions have their limitations, in this paper we explore these limitations and present an alternative solution using a case study of Zaatari refugee camp in Jordan.

2. Top-down solutions

Top-down solutions are shelters that are designed and manufactured abroad and then shipped to site when needed. These solutions usually require complex transport systems, where the unit is either shipped as a whole or divided into few parts and assembled on site.
A lot of research efforts has been invested into developing innovative transportable shelter systems. For example, Ikea developed flat packed shelters under the initiative ‘better shelter’ that are currently used in Ethiopian refugee camps among others [5]; Exo stackable shelters [6] were developed by Reaction Housing which come in two parts, a stackable shell compromising the walls and roof, and a base for the floor. A summary of current research on transportable shelters was presented in [7].

One of the main benefits of such approach is that it allows for robust and engineered solutions; for example, thermally insulated shelters or units that are fitted with wet facilities. Affordability, ease of deployment and transportability are some of the main driving factors behind most top-down solutions. Whilst these are all important considerations especially in situations where a quick response is needed; a top-down approach generally means that lesser attention is given to the cultural, social and personal needs of the residents. Michael Agier suggests that in a post 9/11 context the world has distanced itself further from those considered undesirable, as a result he argues that the manner that governments treat refugees today has become mass produced for handling the masses, not the individual [8]. This is visible in Top Down shelter initiatives where products come across as distanced from the cultural and social needs of refugee residents. Additionally, despite transportability and price being key drivers of top down temporary shelter initiatives; the resulting products are still not easy to move to areas with difficult access and still require heavy transport systems [4]. Often resulting in more expensive solutions than a similar bottom up system due to the associated costs of transport and production [9] (Figure 1).

Figure 1. Right: U-dome by World Shelter (photo credit: World Shelters); Left: Exo stackable shelters (Photo credit: Michael McDaniel, 2016)

Figure 2. Right: Superadobe construction technique, (Photo credit: Calearth.org, 2017); Left: Philippine temporary bamboo and timber shelter (photo credit: Jenelle Eli, IFRC)
3. Bottom-up solutions

These types of shelters are usually built with locally available materials, for example, earth shelters, primarily timber shelters or shelters built of metal sheeting. In these cases, actors responsible for the management of the camps provide tool kits and training for the displaced population to build their own shelters or in some cases the camps could be built in advance of the arrival of refugees. This approach can help overcome the high cost of transport of prefabricated shelters. In addition, community participation can create a strong identity relationship between the occupants and their new dwellings, creating ownership and a greater sense of responsibility that one relates to home. However, such solutions are not always feasible in refugee settings due to political sensitivities. In addition, vulnerable families (for example elderly or disabled) might be at a further disadvantage if they were unable to get enough support to construct their shelters. Furthermore, unlike top-down solutions, shelters built on site might suffer from poor built quality and workmanship, such as gaps in the structures. This could result in a poor thermal performance, draughts and rain leakage. Also there might be negative implications on the local environment, if the sourcing of materials is not sustainable and well managed. The construction time might take longer, and they are sometimes seen as diverting efforts from post-disaster recovery and permanent housing reconstruction especially in the cases of internally displaced populations (Figures 2, 3).

Despite the aforementioned issues associated with bottom up solutions; it is often argued in the literature that these solutions are more suited to local context and culture. To shed more light on the positive impacts of bottom-up solutions; some of the benefits associated with them are discussed below.

3.1. User participation impact on quality of life and psychological well-being

In a case study by IBC (International Blue Crescent) and CRS (Catholic Relief Service) in which beneficiaries were engaged in the construction and decoration of their accommodation; it was found that involvement in the process gave residents an increased sense of belonging, reinforced the sense of identity and recognition of home. Those involved also benefited from learning construction techniques [10]. While mass production of a single design can provide the basic temporary shelter requirements of privacy and shelter, the quality of life that comes with individuality, culture and a sense of home requires a more localized architectural approach. Beyond the initial need for basic shelter refugee housing is the starting point for rehabilitation following the traumatic experiences they left behind. In order to begin to recover the displaced need to re-establish a sense of ownership and belonging in their new accommodation; to apply the cultural context of home.

In 2009 Christine Walsh published a paper, Characteristics of home: Perspectives of Women who are homeless, exhibiting findings from 20 interviews with homeless women in Calgary providing insight into how best to design for the displaced. Walsh suggests that a sense of home is vital in recovery from the hardships experienced by these women. Both homeless and internationally displaced persons go through the trauma of being without a home, as a result the concept is of heightened importance to both groups [11]. Despite the understanding of its importance, it is hard to correlate a universal definition of what home is. Coming from such different backgrounds the women interviewed give stark contrasts in the values they perceive as home, exaggerating the individual nature of the thing. A study at the University of Padova, Italy on the psychological effects of living in a Dacha, traditional home, or metal container on earthquake victims suggested that a home attachment could improve on post-traumatic stress reactions. The findings build on Walsh’s suggestions of the importance of culture to the concept of home; that shelter shape and material are important in matching a cultural prototype of home. The study shows a correlation between shelter type and psychological stress, concluding that cultural attachment to their accommodation benefits residents psychological well-being [12]. It is therefore important that refugees feel a cultural connection to their accommodation. The comfort that comes with a sense of home would further enable refugees to return to normality.

“Victims assigned to dachas were more satisfied with and more attached to their temporary homes and reported greater psychological wellbeing (fewer psychological stress symptoms, less discomfort and a lesser feeling of being dominated by the situation).”

(C. Giovanna, F. Ventimiglia, A. Maass (2010): 1)
3.2. Utilising refugee innovation and skill sets

Independence within a camp context is another important sign of normality. Governments might discourage this as self-sufficiency can indirectly imply permanence. While host governments and many aid organisations seem to consider refugees as passive dependents [13], the reality is that the majority of refugees have had comfortable lives, where they might have been a professional or run a successful business. Despite their skill sets refugee communities are consistently under-estimated and under-utilised in the construction of their own shelters. In 2015 Alexander Betts, Louise Bloom, and Nina Weaver published a paper on refugee innovation. The paper pays homage primarily to the skills, motivation, creativity and drive of refugees. Looking at examples from around the world the paper demonstrates refugee adaptations to the aid they are provided with in order to meet cultural and individual needs, often making the materials work harder and go further than the original designer had intended [14]. Lionel Beehner’s essay ‘Are Syria’s Do it yourself Refugees Outliers or Examples of a new Norm?’ looks at refugee adaptations to provided shelters, observing the case study of Za’atari Camp in Jordan. The paper argues that the more common than not adaptations to shelters in the camp were inevitable; that despite standardised aid distribution refugees will rebel against the uniformity [15]. When residents’ demands of their housing change and they are no longer grateful for temporary shelter but in need of a temporary house or home, they will adapt their environment to suit. If a unit fails to meet users’ cultural and individual needs they will make changes and additions to meet their personal standards.

4. Discussion: The case for customizable and adaptable solutions

Albounour suggests that temporary houses are not discrete products for mass production but cultural artifacts of special meaning to the communities that use them [10]. While he admits the need for construction to be as quick and affordable as possible it should do its utmost to encourage local participation. Evan Elise Easton-Calabria looks at the issue in a historical context, proposing that aid distribution to refugees before the second World War the United Nations took a Bottom Up approach. That the system was beneficial for both the refugees who learnt self-sufficiency and the host nations who gained from the trade and boost to the workforce [16].

‘Thrown almost naked on the shores of Greece, [refugees] have displayed such an industrious and active spirit that they are nearly all able today to earn their own livelihood without any help from the Greek Government or any other source. Refugees’ ‘morale and their scale of living rise visibly month by month, and their asset value to Greece increases in proportion to the decrease of their miseries’


To get around the high cost of transport a number of shelter designs have moved to a kit system, allowing for elements of the shelters to be more easily packaged and transported. The advantage of a kit system is that, although partially prefabricated, it is constructed on site, which allows for community participation. Which in turn helps create a strong identity relationship between the occupants and their new dwellings, a sense of ownership and a responsibility that one relates to home.

As such, combining the two common approaches of top-down and bottom-up solutions can be beneficial to both the stakeholders and the beneficiaries alike. Solutions that are partially prefabricated, but designed to allow self-assembly, flexibility and a range of configurations; can combine robustness and enhanced performance, with individuality and user participation. Such approach can also allow for the displaced people to be involved in the decision making and giving them a choice over the shape or feel of their new home. Yet offer a better built quality shelter in terms of its thermal performance, durability and built quality. Below we present the case of Zaatari refugee camp in order to demonstrate the likely benefits of such approach.

5. Case study: Zaatari refugee camp, Jordan

Al Za’atari refugee camp, 12km south of the Jordan-Syria border [17], hosts around 80,000 Syrian refugees making it the 4th largest city in Jordan and the largest Syrian Refugee camp [18]. In 2017 the camp has just passed its 5th anniversary; since opening on 29th July 2012 [19], Za’atari Refugee Camp has evolved from a handful of tents in the desert to a high functioning urban settlement. The camp’s evolution, from tent camp into an urban settlement of some 80,000 persons reflects both the needs and aspirations of the camp’s residents and a transition to a more predictable, cost effective and participatory platform for the delivery of assistance [19].

“In the Middle East, we were building camps: storage facilities for people. But the refugees were building a city.”

Kilian Kleinschmidt [20].

Despite efforts to initiate self-sufficiency within other aid sectors the housing distribution is still based on a Top Down System of design and construction. The majority of structures in Zaatari camp are mass produced caravans. However, the majority of residents have made
We surveyed 54 households in several districts in Zaatari camp and found that 92% of the families had adapted their buildings in one form or the other. These included building a side extension to the caravan (70%), enclosing between two caravan units creating a shaded courtyard (43%), creating an additional window (3%), and replacing the timber floor of the caravan with cement on gravel. These results are in line with UNHCR findings in 2014 [21] in which, 1000 of the 16000 surveyed shelters had structural modifications to the caravan itself however over 3,500 had new cemented courtyards between the caravans. These number are likely to have

Figure 4. One man dismantled one of his caravans to build a new roof between the other two caravans, creating a living space with a ventilated roof to overcome the summer heat

Figure 5. Improvised shading solutions and extensions. Notice sharp edges could be dangerous for children

Figure 6. Decorative elements helps create a feeling of a home
increased as UNHCR data shows that the oldest districts in Zaatari camp also showed the highest percentage of structural modifications to the caravans [22]. As such it is safe to assume that being in the camp longer gives residents a stronger motivation or means to adapt their living conditions. Many of families interviewed stressed that what we were seeing was the result of several years of savings and step by step modifications.

The high number of adaptation demonstrates a camp-wide dissatisfaction with the provided shelter in its unaltered form. Adaptations to existing shelters could be seen as a signpost for inadequacies in the provided accommodations ability to meet cultural and individual needs. Adaptations simultaneously provide evidence of the skill sets and motivation of resident refugees to improve their living conditions. There is evidence in Zaatari camp that refugees did not only adapt their shelters out of necessity but also in the pursuit of creating a ‘home’. Many of the adaptations made were aesthetic or decorative. This has transformed the camp from grid-like standardized caravan camp into an organic camp with each shelter having its own character and individuality. Such expressions innovation and independence should be encouraged. There is evidence that refugees would welcome an opportunity to work and are willing to take part in the construction of their homes. In November 2017, following an announcement the previous February that Syrian refugees living in camps could obtain permits to work anywhere in the country [23], UNHCR commissioned a survey to determine the skills sets of Refugees living in Zaatari camp. The survey determined that over 20% of male residents had experience in the construction industry. The survey also showed the value of training and willingness to work:

“When offered training 54% of female and 75% of male respondents would be willing to take up a job outside of the camp, and are also willing and interested in gaining any new skills that may open up avenues for employment.” [23]

The survey strengthens observations that refugees already have the skill, innovation and drive to make them keen learners, eager to take on the opportunity to learn new skills. A combined system of Bottom-Up and Top-Down approaches to construction of shelters would make use of the refugees drive and skills, offer them training opportunities, allow them to express their individuality and improve their well-being. In addition, it will better guarantee that the shelters are hazard-free, robust and comply with local rules and guidance.

6. Conclusions

Shelter solutions come in two main brands; top-down and bottom up. This paper discussed the pros and cons of each solution and demonstrated through the case study of Zaatari camp that a hybrid approach may be more appropriate. The case of Zaatari camp is proof that refugee camps are in need of more long term and readily adaptable shelter solutions. Zaatari’s caravan shelters are not designed with adaptations in mind, as a result the architecture of adaptations and extensions to the shelters is haphazard and inefficient. The evidence suggests that despite a lack of framework for adaptation in the prefabricated shelters, the drive of residents to customise the place where they live is strong enough to overcome the rigidity of the shelter design. In order to achieve a higher standard of living and improve on the quality of the provided shelter. Refugees would no longer need to resort to expensive and inefficient methods to adapt their shelters if given the opportunity to be involved in the decision making and design their own shelters to meet their individual expectations. Thus, shelter construction might become more coherent and cost effective in the long term. With improved shelter solutions, adhering to cultural and individual needs, would come a return to relative normality and as such an improved psychological wellbeing amongst residents.

Acknowledgements

Healthy Housing for the Displaced is an interdisciplinary project at the University of Bath led by Prof David Coley. This research was funded by EPSRC/GCRF (EP/P510907/1), EPSRC (EP/P029175/1) and was conducted in collaboration with UNHCR Jordan and Princess Sumaya University for Technology.

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