

“UNDRO studies have shown that post disaster problems are aggravated by human error and lack of foresight and that disaster relief can without a doubt be made more effective through systemised planning and management carried out in the event of disaster rather than in response to it.”¹

02 | DESIGN TASK: REVIEW AND REASONING

2.1 PROBLEM STATEMENT

One does not need to delve deep to find the problems associated with universal ‘donor’ solutions. Current disaster response methods involve issuing the displaced victims with either a United Nations tent [designed for the use of refugees] or, if they are lucky, with what is termed a ‘starter pack’ consisting of ten sheets of corrugated iron, ten poles and two bags of nails.

Temporary shelter solutions aim to address the immediate need for survival. While relief measures can be quantified² in terms of water [20L per person per day] or food [0.2 tonnes per person per month], the extent to which shelter can aid emotional wellbeing remains unclear.

In a disaster both tangible and intangible losses occur, yet current measures only account for the physical. It is here where one of the first constraints - **or pressures** - in designing for disaster relief reveals itself. Psychological needs such as familiarity and finding a sense of place elude quantifiable definition, so how can design begin to account for the innumerable variations in the needs of victims?

This notion is reiterated upon evaluating the interior space of shelters. When shelter is allocated solely on the basis of the economy [3.5 sqm per person] without considering how the space is to be used, the premise of efficiency is contradicted. This presents a missed opportunity for the architecture of the interior to

contribute to place at a time when the trauma of loss is at its peak.

Post-disaster relief and transitional efforts entail a fragmented process of isolated objects. The dearth of regional shelter guidelines means that decisions are made without considering the subsequent recovery phases, often resulting in prolonged relief operations and accelerated costs.

Tented solutions do not pre-empt the recovery phases that follow and are reclaimed after a certain period, leaving the inhabitants with very few or no options. Such universal solutions are not contextually suitable in terms of local building practices, climate and cultural relevance.

More complex portable architectural solutions often hinder recovery efforts more than they enable them. Prefabricated solutions, if not locally manufactured, take too long to arrive on site; they can be heavy and difficult to transport and very expensive. There are an infinite number of hidden pressures prohibiting design in humanitarian aid; this thesis shall attempt to identify the most prevalent of these.

¹ Kronenburg (2002b:102)

² Browne (1998:83)

2.2 HYPOTHESIS / DESIGN TASK

2.2.1 VISION

This thesis envisions creating a South African shelter typology, i.e. a well-rounded, adaptable sheltering process that embodies a holistic response to the physical and psychological climate and site conditions, that is culturally relevant and economically viable, and that makes use of local materials and manufacturers.

To arrive at such a result, the thesis proposes that several region-specific solutions be developed that can either remain indigenous to their regions or be synthesized into a national typology.

This project deals with formalizing a sheltering process within the climatic constraints and context of the greater Tshwane region; it proposes a temporary architecture that would fit into the existing urban fabric.

2.3 PROPOSAL

The success of the mitigating strategies following a disaster is dependent on a network of actors hailing from numerous professions. The hypothesis is focused on formulating an effective response within the capacity of design.

The emphasis of the project falls on filling the gap between short-term relief provided in an emergency and the time frame left over until [or whilst] reconstruction is taking place. This thesis refers to this temporary phase as **'a period of grace'**.

A responsive environment that aids emotional well-being and morale would enable the occupant to become self-sufficient. A shelter that is adaptive and flexible enough to be used independently would have the potential to morph into a new dwelling when more resources become available.

The project is a solution in itself as well as a building block forming part of a greater end result. The response is not intended for a time-specific scenario and location, but strives to formulate a relevant approach to reconcile the events of the past, the damages of the present and the opportunities of the future.

2.3.1 A THEORETICAL APPROACH

The aim is to clarify the ability of design to contribute to disaster recovery. Throughout the thesis the role of design in the event of a disaster is continuously redefined.

The hypothesis argues that interior architecture is a necessary extension of architecture, even in the case of limited resources. Insight gained from the theoretical discourse aims to provide a solution that is as creative as it is functional.

The argument draws out the differences between shelter and dwelling and explores how finding a sense of place after being rendered homeless can aid in recovering one of the many intangible losses experienced by disaster victims.

Learning from the opportunities that the elements of disasters present, the humanistic approach to Maslow's basic needs is interpreted as the hierarchy of design requirements in response to questions about the role of aesthetics in humanitarian design.

These topics are explored to formulate a theoretical approach to strengthen a design solution capable of moving beyond bounds of preconception.

2.3.2 A PRAGMATIC RESPONSE

Gordon Browne³ of the Southampton Institute contextualises what Buckminster Fuller advocated. He raises the necessity for designers and manufacturers to work together with industry to provide inexpensive construction materials which can be locally manufactured, using indigenous materials and unskilled labour.

The focus of this project is a critical revision of rapidly deployable shelter systems that employ an unfolding / collapsible material system. The aim is to derive low-cost strategies that can be locally manufactured and be readily available. This is achieved through the exploration of alternative building materials and construction methods, resulting in an interdisciplinary approach.

The role of the interior architect falls within the realm of the temporary, and this is what the thesis project hopes to resolve completely, by providing a conceptual proposal for the preceding emergency and following transitional phases.



³ Browne (1998:82-87)



2.3.3 FUNDING

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As stipulated by the National Disaster Management Act, every municipality is required to set aside a budget allowance for disaster response and recovery. This budget is reviewed annually as part of the Integrated Development Plan [IDP] and amended when necessary. The potential for funding can be increased in two ways:

(a) Collaboration with industry

To ensure that the best possible solution reaches those who need it most, it is the ideal to design open source architecture under the Creative Commons developing nations license – this would allow anyone to manufacture the product on the condition that it cannot be sold for profit within the field of emergency shelters. The solution can therefore be freely distributed and adapted, increasing its potential for evolution.

This does not however rule out the possibility of developing variations of the concept for other temporary applications such as site offices, voting stations, etc. The feasibility of such endeavours can most likely fund the production of these temporary shelters whilst becoming a viable business venture.

(b) Branding rights

In the aftermath of the March 2009 Soweto flash floods, Anglo American⁴ donated R 1 000 000 in aid of

the flood victims. Disasters attract a massive amount of press coverage that in turn encourages a wide range of donations. Proposals for funding can be put forward by private sector entities or volunteer organizations in exchange for branding rights.

2.3.4 TARGET POPULATION



The proposal deals with improving the lives of those who have just lived through the traumatic experience of losing their primary dwelling. They have in effect become internally displaced due to a disaster, which can be natural, for instance floods, or man-made, such as fires.

Such victims would typically be dependent on government and other goodwill organizations for relief, on the assumption that they do not have any other means of insurance.

2.3.5 LOCATION



The intended solution should benefit a variety of scenarios and sites, and therefore involves a non-site-specific design proposal. It is however to be a local response as opposed to a universal solution. The ideas generated through research are thus applied to disaster shelters for victims located within the context and climatic constraints of the greater Tshwane Region.

2.3.6 DELIMITATIONS

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- Political disasters such as xenophobic attacks and war are excluded from this study. Research has shown that refugees hold a unique set of characteristics that merit an entire study in itself. But because current mitigation strategies are the same for both situations [i.e. the UNHCF tent], examples of living conditions experienced by refugees were included where similarities between disaster victims and refugees presented themselves.
- The project refrains from proposing camp layouts on an urban scale for the reason that it is South African government policy not to maintain shelter camps. The recent emergence of refugee camps was born out of desperation, not protocol.
- Due to the fixed duration of the study course and the nature of the topic, opportunities for gaining insight into the most likely disaster scenarios were limited. Thus case studies from beyond the boundaries of Greater Tshwane were included.

2.3.7 ASSUMPTIONS

- Sanitation, food, and medical and cooking facilities are not to be formally addressed when designing for the post-disaster emergency and temporary phases. It is assumed that these needs have already been met by other means.

⁴ Anglo American (2009:[1 of 1])

2.4 AIMS + OBJECTIVES OF STUDY

This thesis aims to:

- (a.) Define the role of design in terms of disaster response
- (b.) Present the needs and shortcomings pertaining shelter provision
- (c.) Identify the opportunities that arise in event of disaster that could provide better, more efficient modes of shelter
- (d.) Initiate spatial guidelines for effective emergency relief, based on international standards, within the South African context
- (e.) Determine if a collaboration with industry can be established that allows for shelter to be manufactured for emergency with the possibility of developing the same technology into other products for commerce.

2.5 REVIEW OF RESEARCH METHODOLOGY

2.5.1 FRAMEWORK

To establish the project within a legislative framework, a research proposal is developed in alignment with the objectives of the National Disaster Management Policy.

Possible South African shelter guidelines are initiated through a comparative study of the following:

- SABS Building Regulations
- International Shelter Standards
- Current practice: the UNHCR tent
- Commercially available products

2.5.2 CONTEXT STUDY

Context is defined through a series of studies, including the types of natural phenomena endemic to the greater Tshwane region, an investigation of associated risks, the likeliness of unfortunate events recurring, and climate and environmental conditions.

Through the use of case studies, site visits and interviews the research also considers the factors that contribute to vulnerable conditions, as well as the needs that derive from the current response methods.

2.5.3 CASE STUDIES

Site visits and analysis of relief and transitional efforts in:

- BRAAMFISCHERVILLE, Soweto
Type: Flash floods
- KLERKSOORD, Akasia
Type: Shelter camp for refugees displaced by xenophobic attacks
- CENTRAL METHODIST CHURCH, Braamfontein
Type: Collective centre for refugees displaced after shelter camps where dismantled
- IRENE CONCENTRATION CAMP
Type: Historic Case Study

2.5.4 INTERVIEWS

- Displaced victims of flash floods, Braamfischerville
- Red Cross Volunteers, Soweto
- Red Cross Volunteers, Pretoria
- Department of Disaster Risk Management, Tshwane Metropolitan Municipality

- Department of Housing, Tshwane Metropolitan Municipality

2.5.5 MATERIAL EXPLORATION

Exploration of materials by conducting the following experiments:

- Cardboard fire and waterproofing experiments
- Build a prototype to test strength and durability

2.6 OVERVIEW OF SIMILAR PROJECTS

Chapter 07 will discuss shelter typologies in terms of the theoretical discourse. These will include:

- Concept derivatives
- Temporary shelters
- Folding shelters
- Sheltering elements
- Surfaces + Textures