Developing analytic framework(s)/ tools for shelter and emergency structures from the material perspective

Presentation by Kaat Boon

IFRC SRU Conference on Innovative Sheltering
Berlin, 3-4 May 2016
Analytic framework(s)/ tools for SHELTER AND EMERGENCY STRUCTURES:

What are they & what do they need to do?

BUILDING UP AN UNDERSTANDING STARTING FROM THE MATERIAL PERSPECTIVE

CHANGING AND UNPREDICTABLE DISASTER CONTEXTS & RESPONSE PROCESSES:

Climate, hazards, remaining local capacity, funding, embedding of NGOs etc.
1

Product analysis
A suitable shelter reflects:

THE DISASTER CONTEXT & THE RESPONSE PROCESSES

SHELTER

Internationally:

Process of sheltering is fairly standardized

Product of shelter remains trapped in the anecdote or overly generic design guidelines, or is context-bound, little systematic knowledge creation
Structured analysis of an individual shelter

**IFRC SRU Shelter Solutions Project**

Structured comparison of shelters
Shelters (being) built after Cyclone Sidr 2007
> **Minimal technical quality / equity?**
IMPLEMENTATION EXAMPLES

Bangladesh Technical Shelter Workshop, Nov 2014, Gaibandha

- Intense exchange of in-country shelter experiences and expertise
- Recognition that the in-country experience and expertise is substantial and can and should be consolidated into national guidelines

Hosted by the Department of Disaster Management and Relief of the Government of Bangladesh // Organised by IFRC SRU in collaboration with Friendship Bangladesh // Funded by the Government of Luxembourg, Friendship Luxembourg and the Luxembourg Red Cross
TOWARDS ANALYSIS OF SHELTERS AS BUILT AND INHABITED

Beneficiary satisfaction with shelter as built and inhabited

+ How shelters evolve over time: maintenance, adaptability

+ Value for money evaluation: cost estimates, expression of priorities

Structured photographic documentation of an individual shelter

Caritas – Secours Catholique Pilot Low-Cost Housing Project Evaluation

+ Expand to requirements for shelter:
  - Adapted to hazard type and level
  - Internal comfort
  - Functionality
  - Appropriateness
  - Adaptability / transformability
  - Optimal use of resources
  - Maintenance and repairs
  - Etc.
Performance requirements analysis
EMERGENCY STRUCTURES (PREPOSITIONED)

Requirements in relation to emergency structures can only be known once the disaster context and response process are clear

Emergency structures need to remain sufficiently standardized to be prepositioned, rapidly deployed and made ready for use

‘NEED’
- Discussions on emergency structures are often context-bound and/or anecdotic, hampering the process of capturing and applying lessons learned
- Difficult communication between users of emergency structures and developers, impacting negatively on the effectiveness of innovation efforts

A suitable emergency structure reflects:

THE DISASTER CONTEXT &
THE RESPONSE PROCESSES
## UNICEF SD MARKET SURVEY TEMORARY STRUCTURES

### B. DESIGN ASPECTS IN RELATION TO PERFORMANCE IN THE FIELD

<table>
<thead>
<tr>
<th>Description</th>
<th>Site</th>
<th>Structure</th>
<th>Skin</th>
<th>Service</th>
<th>Spaces plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>requires the site to be</td>
<td>guy ropes and tent pegs, galvanized steel pipes, 30 x 1.2 mm with</td>
<td>single fly, 250g/m² PE, water, rot and UV</td>
<td>nothing mentioned</td>
<td>8 by 6m, wall height 2.05m, ridge height 2.9m, Rectangular.</td>
<td></td>
</tr>
<tr>
<td>flat tered.</td>
<td>steel cross pieces.</td>
<td>proof.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind and other hazards</td>
<td>guy ropes and tent pegs, hammered into ground. Shock absorbers on</td>
<td>medium pressure can build up inside</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>the guying lines to increase the wind resistance. Floor pipe available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>NA</td>
<td>skin lets light come through.</td>
<td>artificial lighting probably not necessary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>openings on 4 sides, so orientation on site a little less important</td>
<td>ventilation grate above door end, windows</td>
<td>not suited for cold climates, difficult to cool in hot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>footprint substantially enlarged by guy ropes</td>
<td>quite small and closed so can’t play a role in</td>
<td>climates. winter kit and shading net available but not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functionality</td>
<td>non-straight walls make movement along sides difficult</td>
<td>door width not clear, only one door, quite</td>
<td>doesn’t rely on any external techniques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>performs less well in rainy areas</td>
<td>closed space</td>
<td>non-straight walls reduce usable space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformability</td>
<td>NA</td>
<td>elements can be re-used</td>
<td>difficult to re-use or change</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Site**: Features related to the structural integrity and safety.
- **Structure**: Components of the structure itself.
- **Skin**: Features related to the exterior protective layer.
- **Service**: Performance indicators for practical use.
- **Spaces plan**: Dimensional specifications for spatial configuration.
What is an emergency structure?

1. STANDARDIZED EMERGENCY PACKAGE THAT CAN BE PREPOSITIONED
2. A SET OF ITEMS TO BE ASSEMBLED ON SITE
3. A BUILDING FOR A PARTICULAR FUNCTION AND USER GROUP

> An emergency structure needs to perform optimally in each of these roles

Developed and tested in the context of an investigation into UNICEF’s requirements in relation to prepositioned emergency structures
Requirements for emergency structures:

Category 1: **Supply Chain** --- the process of making the structure readily available

Category 2: **Climate**
Category 3: **Hazards** --- Internal comfort and structural soundness, measurable standards can be set

Category 4: **Functionality** --- the user perspective, using the space

Category 5: **Durability and maintenance** --- How an emergency structure performs for the duration it is used for (standards can be set), and going into a next phase of the response

Category 6: **Afterlife**

Category 7: **Cost** --- comprehensive cost throughout the response process (and after)

Category 8: **Timeliness** --- asap but sensitive to the phases of the response

> Broken down into sub-requirements
Used to describe, evaluate and set priorities per disaster response and response process:

Examples (fictional):

Locally built school after Cyclone Sidr, Bangladesh:
- **Afterlife**: Community participation pointed out a willingness to transform the structure over time into a more permanent one
- **Climate**: Local building techniques allow for sufficient ventilation and rot prevention
- **Durability and maintenance**: Using local materials ensures maintenance can be done
- **Hazards and supply chain**: Training can easily be given to improve the local techniques
- **Timeliness and cost**: Local construction can be done timely, and is cheaper than a tent

Imported warehouse tent in newly accessible Syrian city:
- **Timeliness**: Flying in a prepositioned warehouse is quicker than securing an existing space
- **Supply chain**: Warehouse has a guaranteed quality, is readily available and well-known by users
- **Cost**: Rent would exceed purchase and transport cost when warehouse is used for more than 6 months
- **Durability and maintenance, afterlife**: if necessary canvas can be replaced, structure can be handed over to local partners
- **Climate and hazards**: Standard warehouse is sufficiently comfortable and resistant for the local climate and hazard profile
Developed and tested in the context of an investigation into UNICEF’s requirements in relation to prepositioned emergency structures

This categorization of requirements was used to:

- **Collect field experiences** with emergency structures in a structured manner, evaluate them
- **Analyse UNICEF’s current offshore procurement offer** of emergency structures
- **Formulate recommendations for innovation (process and product)** – *under consideration with UNICEF SD*

Can be expanded to:

- Changing the information exchange between users, buyers, developers and suppliers
- Analysing local and prepositioned solutions in one framework
Setting standards nationally
A suitable shelter reflects:

**THE DISASTER CONTEXT & THE RESPONSE PROCESSES**

**SHELTER**

*Nationally:*

- Difficulties in translating theory of process of sheltering into practical application, certainly when it comes or ‘transitional shelter’ which is often misunderstood as a product rather than a process, or ‘building-back-better’: localizing

> <

- Responsibility to design, need to guarantee a minimum quality and equity in the shelter product, fitting the context, and BNF live in shelters when agencies are gone
CONCEPTS

Consolidating in-country experience and expertise (extensive research and consultation) +

Up to international best practices

Enabling accountability against minimum standards +

Allowing for diversity to reflect changing disaster contexts and response processes

STAKEHOLDERS

Leading: Ministries of Disaster Management and Relief and Housing and Public Works, GoB

Development: Friendship Bangladesh (process), IFRC SRU (concept and draft standards), HBRI (draft designs)

Review: local government, shelter and housing implementers (NGO, INGO, RCRCM, UN), academia, other Ministries

Funding: GoLuxembourg, Luxembourg Red Cross, Friendship Luxembourg
‘RESPONSIVE GUIDELINES’:

PRESCRIPTIVE MINIMUM STANDARDS:

1. MINIMUM STANDARDS FOR ADEQUATE HOUSING
2. MINIMUM STANDARDS FOR IMPLEMENTING AGENCIES
3. MINIMUM TECHNICAL STANDARDS FOR EMERGENCY SHELTERING
4. MINIMUM TECHNICAL STANDARDS FOR SAFER HOUSING

INSPIRATIONAL BEST PRACTICE DESIGNS:

REFLECTING LOCAL VARIETY OF BUILDING AND LIVING PRACTICES, ADAPTABLE, ADHERENT TO MINIMUM STANDARDS
1. MINIMUM STANDARDS FOR ADEQUATE HOUSING

Based on the Universal Declaration of Human Rights, and the International Covenant on Economic, Social and Cultural Rights (ICESCR, 1966) and in-country practice of housing

<table>
<thead>
<tr>
<th>Minimum Standard 3</th>
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</thead>
<tbody>
<tr>
<td>All housing is built with materials and techniques that allow easy maintenance, repair and duplication:</td>
</tr>
<tr>
<td>- Preference to local, well-known and available materials;</td>
</tr>
<tr>
<td>- Focus on local techniques and tricks, and the improvement thereof;</td>
</tr>
<tr>
<td>- Accompany introduction of new materials and techniques with extensive training and follow-up;</td>
</tr>
<tr>
<td>- Look into options to produce new materials locally;</td>
</tr>
<tr>
<td>- Expected repair and maintenance cost and time must remain within the budget of the household and limited to what households can do in combination with their other activities.</td>
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</tbody>
</table>

2. MINIMUM STANDARDS FOR IMPLEMENTING AGENCIES

Based on the Sphere Core Standards and in-country practice of housing

<table>
<thead>
<tr>
<th>Minimum Standard 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base the project on an estimate of the self-coping capacity of communities and households, and the impact of the project on that self-coping capacity, towards greater resilience, and continue collaborative and coordinated assessment throughout the project:</td>
</tr>
<tr>
<td>- Assessments are to target at least physical aspects of houses and sites; climate and geological conditions; hazard profiles; the local construction industry; economic, social, vulnerability and environmental aspects in relation to housing; risks to the project;</td>
</tr>
<tr>
<td>- Engage communities, households, local government, community leaders, actors of the local construction industry (traders, labor), social groups, all age groups, specifically vulnerable groups, in continued assessment;</td>
</tr>
<tr>
<td>- Participate in coordinated assessments with other housing actors, share assessment outcomes;</td>
</tr>
<tr>
<td>- Triangulate assessment data;</td>
</tr>
<tr>
<td>- Ensure projects are informed by assessment outcomes.</td>
</tr>
</tbody>
</table>

(most resembling to current sheltering process standards)
3. MINIMUM TECHNICAL STANDARDS FOR EMERGENCY SHELTERING

Kits based on the work of the Shelter Cluster, designs purposely developed for guidelines

4. MINIMUM TECHNICAL STANDARDS FOR SAFER HOUSING

Based on local experience and expertise

(Note: in coherence with GoB policy: any sheltering beyond the emergency phase is to be technically on par with low cost housing standards)