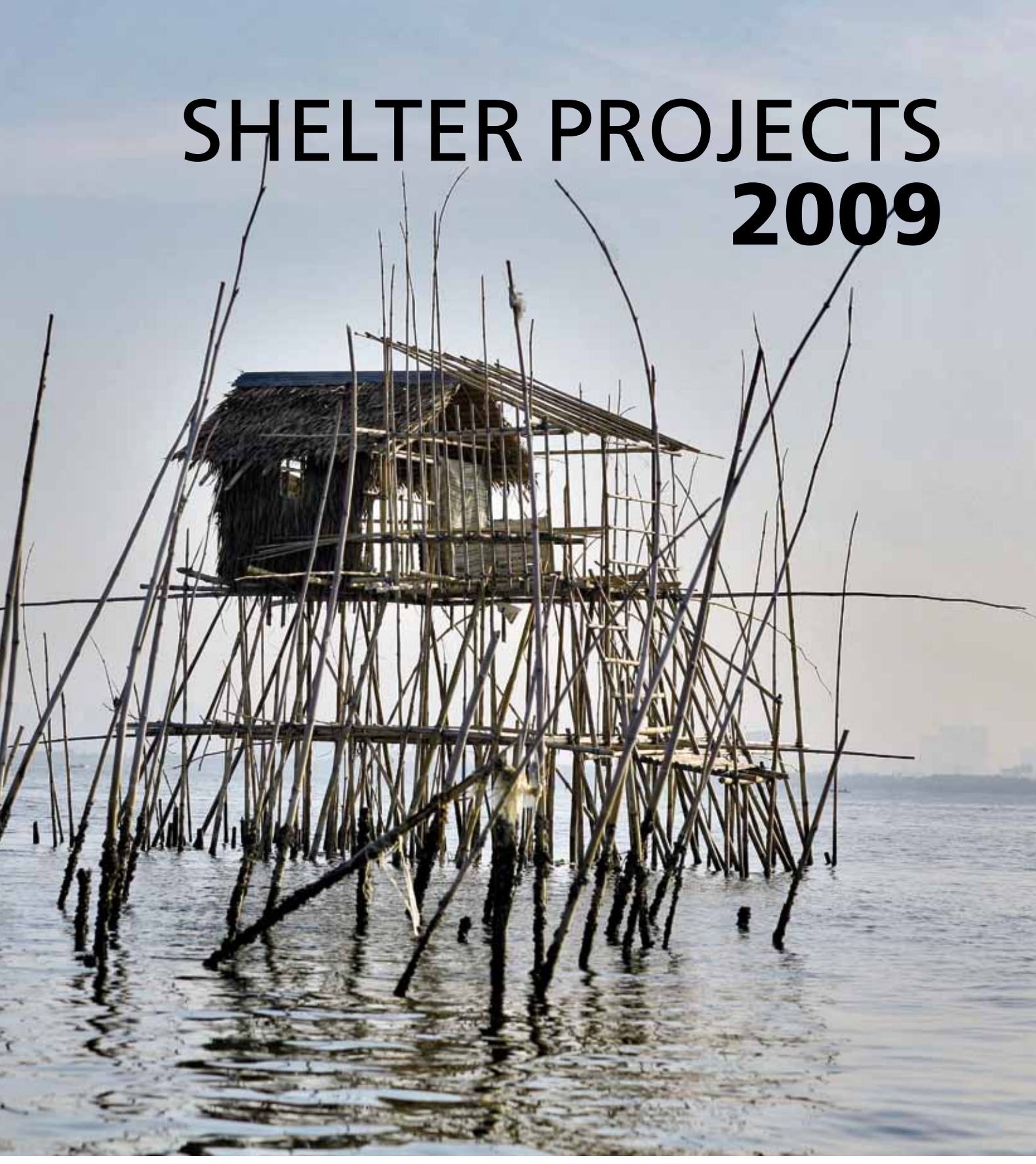
SHELTER PROJECTS 2009



UN HABITAT
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SHELTER PROJECTS

2009

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FOR A BETTER URBAN FUTURE

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Shelter Projects 2009

Published 2010

Available online from www.disasterassessment.org

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Front Cover: A fishermen's hut in Bacoor Cavite area south of Manila, the capital city of the Philippines, March 3, 2008. Fish is the primary source of protein in the Filipino diet. © Manoocher Deghati.

Back cover left to right: Afghanistan, 2009, © Shaun Scales. Hargeisa, Somalia, 2009, © Joseph Ashmore. Dadaab, Kenya, 2009, © Jake Zarins. Uganda 2007, © IFRC. Bangladesh, 2007, © Xavier Génot. Italy, 2009, © Dipartimento Protezione Civile. DRC, Goma, 2009, © Angela Rouse. Somalia, Hargeisa, 2009, © David Womble. Guatemala 1976, © Ian Davis.

Foreword

The attempt to build institutional memory of past disaster responses has always been a challenge within any implementing organisation. Building this memory collectively has been an even greater challenge. Shelter programmes, both the strategy and adopted technical solutions, are at best captured in evaluations, final reports or annual reviews. Most often these sit on the shelves of agency headquarters, are buried inside field manager's laptops or become anecdotal 'snapshots' passed on by the people involved. If not properly documented, memories fade away, year after year, disaster after disaster.

The second edition of the 'Shelter Projects 2009' contributes to changing this trend. It is an institutional collaboration between two key organisations involved in shelter and settlements after disasters, IFRC and UN-HABITAT. It offers a concrete tool for investigation and knowledge-sharing within the sector. It aims to serve the entire community of shelter practitioners, who are called to respond to natural disasters and conflicts both nationally and internationally year in, year out.

As a philosophy, 'Shelter Projects 2009' promotes the idea that each intervention, whatever its impact on the community, offers us lessons learned. Highlighting both good and bad practices will serve to improve quality and accountability of our actions.

Shelter Projects 2009 draws the attention to the following three key findings:

Firstly, several examples show that the use of cash grants, material vouchers and other non-conventional approaches to shelter perform well in emergencies. Not yet mainstreamed, this approach has increased and encourages agencies to move away from standard emergency relief solutions such as tents and tarpaulins, while balancing advantages and disadvantages of this form of assistance with tangible examples at hand.

Secondly, there is increasing evidence that the world is going urban, and so are disasters. Although Haiti's and Chile's 2010 earthquake responses will be captured only in next year's Shelter Projects publication, other examples in this edition address the challenges in providing shelter in cities. How are collective centres and multi-occupancy buildings planned and used in Azerbaijan to host refugees? Does this affect the affected population's ability and willingness to return home or find more sustainable solutions? Can a cash assistance programme still work when there is not much to buy, as is the case in Gaza city? What are the skills needed in urban damage assessments? Do these assessments inform both short term shelter solutions and housing policies?

Thirdly, 2009 has also witnessed disasters in the so-called 'developed' world. The earthquake that struck the Abruzzi region in Italy and left a whole provincial city and its historic core in ruins. The case study tackles disaster response and reconstruction from an angle that humanitarians are less familiar with. It also highlights that, although available resources are considerably higher, many of the issues and bottlenecks are similar to those of the 'developing' countries: loss of human lives, property and assets, pressure to identify interim locations to resettle people, political and legal constraints, equity issues, loss of memory and identity.

On behalf of our agencies, we hope that readers find the case studies relevant to their work and feel inspired to find out more about past projects and to apply this knowledge for future projects. Many of our readers are familiar with the projects or have contributed directly by providing examples and lessons learned from their field work for this edition. Their experiences are also writing the pages of the future editions. Without their contribution there would be no story to tell.

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Acknowledgements

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Compiled and edited by: Joseph Ashmore

Authors of specific sections: Joseph Ashmore, Ian Davis, Jim Kennedy, Jon Fowler, Seki Hirano, Sandra D'Urzo

Case studies have been provided from the programmes of the following organisations:

- American Red Cross
- CARE International
- CHF International
- CRS (Catholic Relief Services)
- GOAL
- ICRC (International Committee of the Red Cross)
- IFRC (International Federation of the Red Cross and Red Crescent Societies)
- IOM (International Organisation of Migration)
- Italian Red Cross
- NRC (Norwegian Refugee Council)
- Oxfam GB
- Predes Peru
- Save the Children
- SDC (Swiss Agency for Development and Cooperation)
- UN–HABITAT
- UNHCR (Office of the United Nations High Commissioner for Refugees)
- UNICEF (United Nations Children's Fund)
- UNJLC (United Nations Joint Logistics Center)
- WFP (World Food Programme)

Special thanks to the following individuals who have been essential in the compilation of this book:

Alberto Monguzzi, Angela Rouse, Antonella Vitale, Bakary Doumbia, Bryan Withall, Caroline Saint-Mieux, Christopher Nixon, Corinne Treherne, Dave Hodgkin, David Womble, Ed Cook, Eddie Argenal, Elin Holmén, Ernesto Morosin, Fabio Torretta, Felix de Vries, Filiep Decorte, Ged Robinson, Glenn Costes, Harry Jeene, Iyad Abu Hamam, Jake Zarins, Jama Yasin Ibrahim, John Flomo, Jonathan Puddifoot, Julia Macro, Lucia Ashmore, Mariam Betlemidze, Martijn Goddeeris, Mawanda Shaban, Melisa Tan, Michele de Tomaso, Neil Bauman, Neil Brighton, Nuno Nunes, Øyvind Nordlie, Pete Manfield, Peter Nicolaus, Qurat-ul-Ain Sadozai, Rita Richter, Sebastien Pennes, Shane Middleton, Shaun Scales, Tom Corsellis, Tim Foster, Usman Qazi, Varatharajah Ramesh, Wolfgang Gressmann, Xavier Genot, Zeyad Elshakra.

We would also like to thank those who contributed to Shelter Projects 2008 whose work is replicated here in the case study summaries.

We would like to thank the Cuny Center in Washington DC for allowing access to the documents that have provided many of the case studies in the historical section.

Documents originally developed for the Shelter After Disaster Guidelines published by The Office of the UN Disaster Relief Coordinator (UNDRO) in 1982. (UNDRO later evolved into UNOCHA). The Shelter Guidelines were developed by an international team of consultants including: Fred Cuny and Paul Thompson of INTERTECT, Fred Krimgold from Virginia Tech. and edited by Ian Davis of Oxford Polytechnic.

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Contents

Section C
Historical case studies - from the archives

Annex
Reference

Introduction

This book contains summaries of shelter projects that have been implemented in response to conflicts and complex emergencies (Section A, page 1) and to natural disasters (Section B, page 39). It also contains summaries of historical shelter projects (Section C, page 83) that took place before 2000.

The case studies in this book were implemented by many different organisations, a full list of which can be found in the acknowledgements section (page iv). In order to allow weaknesses of programmes to be openly shared, none of the case studies are directly attributed to individual organisations.

This book also contains summaries of case studies that have a fuller write up in 🕮 Shelter Projects 2008. Where there is significant new information, updates are included with the project summaries.

As a result of the projects being implemented in diverse and often challenging conditions, they illustrate both good and bad practices. From every case study there are lessons that can be learnt, and aspects that should be repeated or avoided elsewhere.

All projects in this book were implemented in different contexts. The case study Georgia 2009 (A.8 page 16) gives a good examples of how many projects must be continually adapted to meet the changing context. None of these projects should be copied directly.

Selection of case studies

Given the scale of emergency shelter need every year, case studies included in this book must be implemented on a large scale. Trials or design concepts are not included.

The case studies were selected using the following criteria as a guide:

- The shelter project was implemented in full.
- A minimum of five hundred families had improved shelter as a result of the project activities.
- The project was implemented largely within the first year following natural disaster. For conflict-affected populations, chronic emergencies and returns processes, longer timescales were considered.
- Accurate project information had to be available from staff involved in the project implementation.

The case studies that have been selected illustrate a diversity of approaches to meet shelter need. In all of them, providing shelter is more than simply designing architecturally impressive structures.

As a result of challenging contexts, nothing was built at all in some of the projects. In other projects, the advocacy and learning support components of the project had a larger impact than the organisation was able to achieve through construction alone.

Shelter responses in 2009

In 2009, 335 reported natural disasters, killed over 10,000 people and affected more than 119 million people[1].

In 2009 there were also substantial new displacements due to conflict in countries such as Pakistan, Sri Lanka and Somalia. By the end of 2009, 43.3 million people worldwide had been forcibly displaced by conflict and persecution, the highest number since the mid-1990s[2]. This includes an estimated 27,100,000 people who had been displaced within countries, and an additional 15.2 million refugees who had been displaced into other countries.

1) Annual Disaster Statistical Review 2009. The numbers and trends. CRED, WHO, Université Catholique de Louvain
2) 2009 Global Trends: Refugees, Asylum-seekers, Returnees, Internally Displaced and Stateless Persons, UNHCR 2010

Disasters and conflict have had different impacts in different regions. Asian countries were most affected by natural disasters whilst countries in Africa were most affected by conflict.

As many of the responses to disasters in 2009 are still ongoing, many of them are not written up in this book. Instead we include the following new case studies, as well as updates to case studies previously documented in 🕮 Shelter Projects 2008.

New case studies in Shelter Projects 2009
1945
UK (post conflict) - page 116
1982
Haiti - page 54
2007
Bangladesh (Cyclone Sidr) - page 116
Uganda (flooding) - page 79
2008
China, (earthquake) - page 50
Georgia (conflict) - page 16
Haiti (flooding) - page 54
Myanmar (Cyclone Nargis) - page 67
Somalia, Puntland (conflict) - page 29
Somalia, Somaliland (conflict) - page 32
2009
Afghanistan (conflict returns) - page 3
Bangladesh (Cyclone Aila) - page 41
DRC (conflict) - page 9
Gaza (conflict) - page 13
Italy (earthquake) - page 62
Kenya, Dadaab (conflict/ flooding) - page 21

Introduction

	Non-food item distribution		Shelter construction			Labour			
	Urban?	Household items	Shelter materials	Transitional	Permanent / core housing	Cash or voucher	Community	Contracted	Direct	Technical expertise
A.1 Afghanistan - 2009			●	●			●			
A.2 Afghanistan - 2002		●	●		●	●			●	●
A.3 Azerbaijan - 1992	Y			●				●		
A.4 DRC - 2009		●	●		●	●	●			●
A.5 Eritrea - 1998		●	●							
A.6 Gaza (Palestine) -2008	Y									●
A.7 Georgia - 2009		●	●		●	●			●	
A.8 Ingushetia - 1999	Y			●		●	●	●	●	
A.9 Kenya - 2008			●	●						●
A.10 Kenya (Dadaab) -2009			●		●		●		●	●
A.11 Kenya (Dabaab) - 2007			●		●		●		●	●
A.12 Liberia - 2007			●		●	●	●			●
A.13 Rwanda - 2008			●		●		v		●	●
A.15 Somalia - 2008	Y	●	●	●					●	●
A.16 Somalia - 2009	Y		●	●					●	●
A.17 Somalia - 2007	Y				●			●		●
A.18 Sri Lanka - 2007				●	●	●	●			●
A.19 Sudan, Darfur - 2004		●	●							
B.3 Bangladesh - 2009		●		●					●	●
B.4 China - 2009			●		●	●	●	●		●
B.5 D.R.Congo - 2002	Y	●		●		●	●		●	●
B.6 Haiti - 2008	Y	●	●	●						●
B.7 India - Gujarat - 2001			●			●	●		●	●
B.8 Indonesia - Aceh - 2004	Y				●		●	●		●
B.10 Jogyakarta - 2006						●				
B.11 Jogyakarta - 2006		●		●			●		●	●
B.13 Italy - 2009	Y			●				●		
B.14 Mozambique - 2007			●			●				
B.15 Myanmar - 2008			●		●	●			●	
B.17 Pakistan - 2005		●	●			●	●		●	
B.18 Pakistan - 2005				●			●			●
B.20 Peru - 2007	Y		●	●			●			●
B.21 Peru - 2007	Y			●			●		●	●
B.22 Peru - 2007				●				●		●
B.23 Sri Lanka - 2004				●					●	
B.24 Uganda - 2007			●				●			●

Explanation of columns:
- Urban? - was the programme in an urban environment?
- Non-food items distribution - which types of materials were distributed
- shelter construction - were transitional shelters built or were permanent or core houses built?
- Labour - community members built their own shelters, contractors built shelters or direct labour - the organisation built the houses
- Technical expertise - the shelter project had a training component or had significant external technical support

This book includes many diverse projects, all of which aimed to improve the shelter of the affected population.

Projects included in this book range from building damage assessment (A.6, Gaza, Palestine - 2008, page 13) to cash or voucher distribution (page 9) to hiring of contractors to build shelters, to training (B.25, Uganda - 2007, page 79). Many of the projects, such as the one responding to cyclone Sidr in Bangladesh have used several approaches (B.3, page 46) to meet the needs as they evolve following a disaster.

Despite the differences between projects, there are many recurring themes which we discuss below.

Support the affected people

The first and main effort in all responses is by the affected people themselves. Of the case studies in this book, the more effective projects were implemented with the close involvement of the affectees.

📖 Sphere standards and indicators ("Annex" on page 121) provides common standards on participation, initial assessment, monitoring and evaluation.

📖 Supporting the affected people is the first principle outlined in Transitional Settlement and Reconstruction after Natural Disasters as well as in Shelter After Disaster ("Annex" on page 121)

Urban shelter

As over half of the world's population now lives in urban areas, and the long term impacts of many disasters is to drive people further into cities, this edition of Shelter Projects includes case studies of shelter programmes in urban environments.

The case study of solidarity families in Democratic Republic of Congo (A.4, page 9) provides a good example of how finding shelter with host families may be supported. The case study from the Haiti floods of 2008 (B.6, page 54) includes a programme of supporting families in collective centres to find rental properties. The case study of Gaza (A.6, page 13) illustrates a detailed damage assessment of multi-storey concrete buildings with different apartments owned by different families.

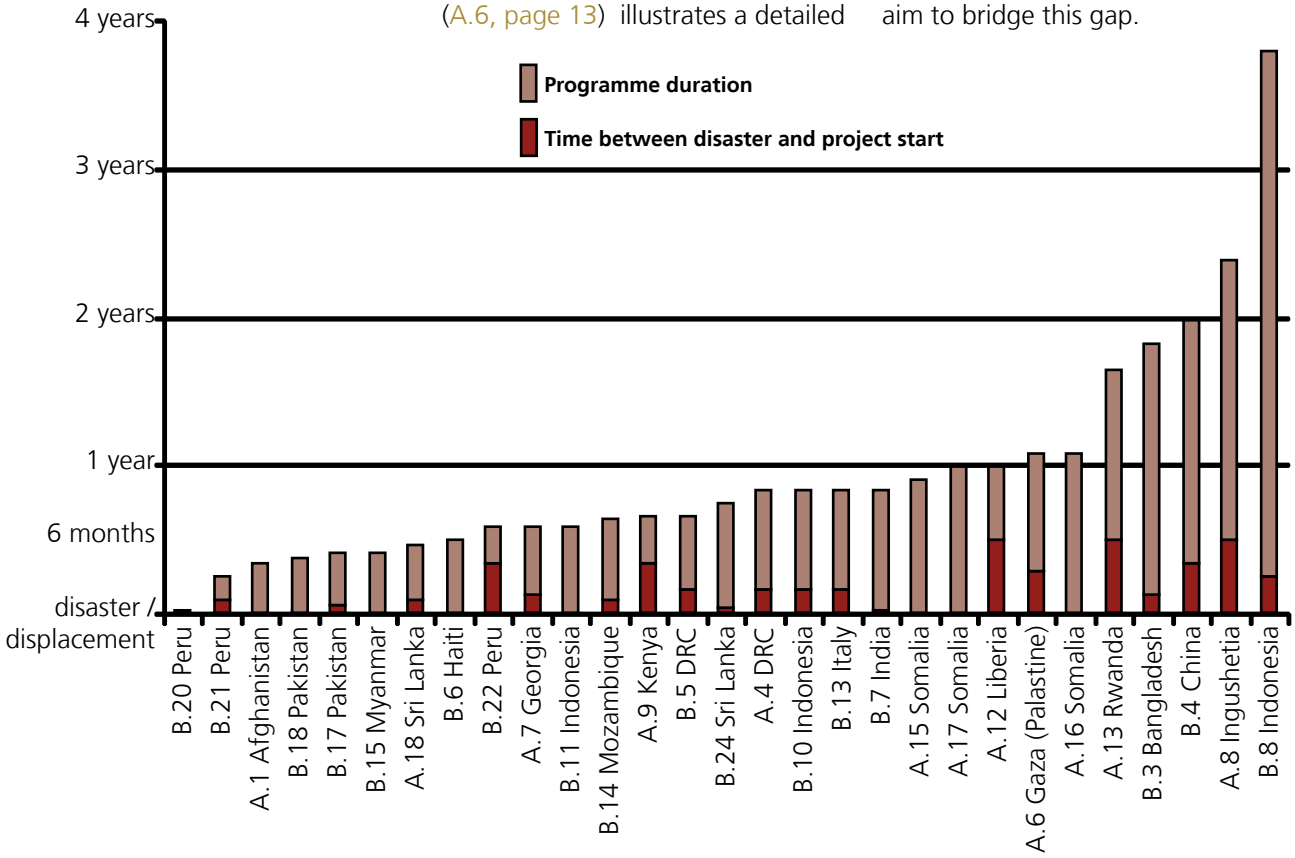
Phases of response

Responses to disasters or conflict are commonly split into phases:

- preparedness before the disaster
- emergency response
- recovery phase
- durable solutions

Many of the case studies include emergency shelter responses aimed at bridging the gap between emergency shelter and durable housing solutions, whilst reducing vulnerability to future disasters. The summary graph below illustrates the duration of the different projects in this book.

Housing programmes can take many years to complete, especially when implemented on a large scale. The project in Rwanda (A.13, page 26), illustrates a housing project that took two years to build 220 houses. The speed of durable shelter construction can leave a gap, with families in emergency shelter for many years. Transitional responses aim to bridge this gap.



Graph of the duration of the different projects. Some of the projects in support of long term displacements have not been included due to their long timelines. The majority of projects were implemented under funding cycles of less than one year.

Introduction

Speed of Response

Commonly, following a large-scale natural disaster, there is a surge of media attention at the outset, with an initial focus on search and rescue and latterly on aid delivery. Media interest often focuses at some stage on the pace of relief distributions.

The graph below illustrates the speeds of emergency distribution from responses in Indonesia (Jogyakarta 2006), Myanmar (2009) and Indonesia (Sumatra 2009). It is interesting to compare these graphs with the media interest which peaks during the first weeks. Relief distributions are run on longer time frames than the initial media reporting of the emergency.

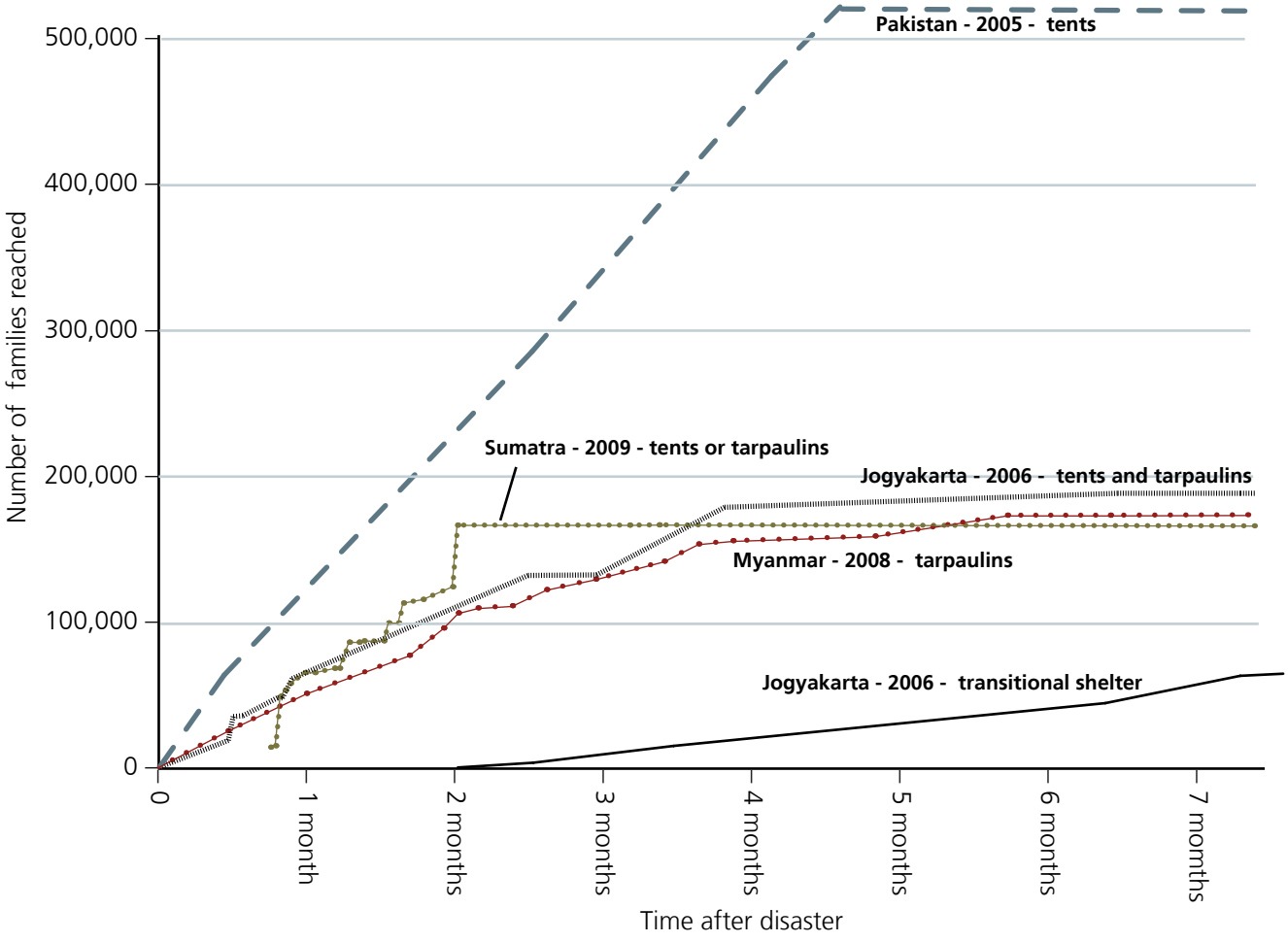
In the first month, organisations must often rapidly scale up staffing, establish supply pipelines and mobilise distribution teams or agreements and support partner organisations. From the examples below, the quickest distribution of shelter items lasted two months.

Transitional shelter programming often takes even longer to implement. The Jogyakarta transitional shelter response (Indonesia 2006) is known as being relatively quick, but still took 12 months to build 75,000 transitional shelters.

Core shelter in which a basic structure is built with the intention that families can upgrade later. In Sri Lanka (A.19, page 36) this allowed short term shelter funding to be used in building more permanent housing.

Permanent housing programmes often take three or more years to complete on a significant scale (see B.8, Indonesia, on page 58 for an example).

Graph of shelter materials distribution to households against time for four major disasters. In all disasters, additional materials were distributed. eg. in Pakistan corrugated iron, plastic sheeting and shelter repair kits were also distributed. The information in this graph does not take into account targetting, or other support activities such as training, advocacy or voucher distribution
Data is taken from shelter cluster commodity tracking lists or from OCHA sitreps and is subject to errors in reporting.



Pakistan - 2005 - earthquake
Households provided with a tent
Total: 520,000 tents

Sumatra - 2009 - earthquake
Households provided with tents or tarpaulins
Total: 170,000 tarpaulins

Jogyakarta - 2006 - earthquake
Households provided with a tent or a tarpaulin
Total: 390,000 tents and tarpaulins

Myanmar - 2008 - cyclone
Households provided with two tarpaulins
Total: 350,000 tarpaulins

Jogyakarta - 2006 - earthquake
Transitional shelter construction
Total: 75,000 built in 12 months

Funding

Funding of is often one of the key determinants of the types of shelter responses. A good illusatration of this is the contrast between the responses to the 2008 earthquake in Italy (B.12, page 62) and the 2007 earthquake in Peru (B.19, page 73) or the conflict in Somalia (A.14, page 73). The different responses to cyclones Aila (B.1, page 41) and Sidr (B.2 page 46), both in Bangladesh, are partly the result of differing funding.

The time frame of funding has a major impact on the projects implemented. Often relief funds are for less than one year, meaning that there is time pressure to complete construction of agreed numbers of shelters rather than to ensure that shelters are occupied and meet the needs.

Scale of programme

The responses illustrate the challenge of whether to implement high quality programmes for fewer people or poorer quality responses to support more people. The case studies in Somalia illustrate this challenge. One project (A.15 Somalia 2009, page 29) delivered improved but basic shelter to over 24,000 people, the other (A.17 Somalia, 2008, page 35) provided improved sites and services for 700 people over two years with higher project costs per family.

Assistance methods

The case studies in this book include a diversity of ways of getting assistance to people who have been affected by conflict or disaster.

A standardised shelter kit of tools, fixings and tarpaulins that can be stockpiled or procured locally and distributed following emergencies has recently been developed and deployed in many countries. The aim of the kit is to support families to build stronger shelters, as well as providing items that will help during reconstruction. The case study from Myanmar provides some lessons for its use.

Climate and risk

Shelter programmes respond to different hazards in different ways. In the town of Bosaso in Somalia (A.15, page 29) one of the major threats to families living in displacement sites was fire, which had destroyed many people's homes. The best way to reduce the risk of a major fire was to work with communities to improve urban solid waste disposal, to install fire breaks, and to establish committees. This proved more cost-effective and practical as an approach than trying to build fire-proof shelters.

Projects were implemented in very different climates. The case study from Sozma Qala camp in Afghanistan (A.1, page 3) illustrates winterisation of tents as well as water supplies for a camp in Afghanistan prior to the onset of winter. Many of the responses, such as that to the Uganda floods in 2007 (B.25 page 79) take into account the weather, maintaining thermal comfort of buildings whilst including hazard mitigation measures.

Selecting project locations and choosing who will benefit is critical to the success of projects. Photo: Joseph Ashmore

Selecting beneficiaries

Project location is often selected by a combination of where need is greatest, where organisations or their partners have existing programmes, and where there are gaps. Giving support to a selected location can create a pull factor and increase the population requesting support. The case study from Gonaives in Haiti, 2008, (B.6, page 54) illustrates some of these challenges and some measures that were taken in response to the pull factors caused by the assistance.

Selecting which individuals or families will benefit from a project is often challenging, and if badly managed can be open to abuse. The case study from cyclone Sidr in Bangladesh 2007 (B.3, page 54) provides an example of selecting families with the agreement of community committees.

Basing selection solely on whether a family's house is damaged can bias responses away from those who rent or squat their homes. Selecting families on the basis of other vulnerabilities such as in Somaliland, (B.16, page 32) requires clearly agreed criteria and requires working closely with communities to be effective. Whichever selection criteria are used, the larger the package of support being offered, the more pressure there will be on getting the selection of families correct.

Training

Many of the projects in this book, such as those outlined for Haiti in 1982 (C.6, page 93) or the programme implemented in Uganda in response to the 2007 flooding (B.25, page 79) have a significant training and capacity building component. Successful training programmes have a significant disaster risk reduction component, allowing the shelter assistance programmes following a conflict or a natural disaster to reduce vulnerability in the future.

Introduction

Shelter size

The illustration below shows the diversity of shelter covered areas in these case studies. These vary from 9m² (B.20, Peru 2007, page 74) to 74m² (B.12, Italy, 2009, page 62) this is a result of varying needs, permanency, budgets logistics constraints, host standards and official policies.

📖 Sphere 2004 - Shelter and Settlement, Standard 3: covered living space has the following indicator:

"Duration: in the immediate aftermath of a disaster, particularly in extreme climatic conditions where shelter materials are not readily available, a covered area of less than 3.5m² per person may be appropriate to save life and to provide adequate short-term shelter to the greatest number of people in need. In such instances, the shelter response should be designed to reach 3.5m² per person as soon as possible, as longer durations may begin to affect the health and well-being of the people accommodated. If 3.5m² per person cannot be achieved, or is in excess of the typical space used by the affected or neighbouring population, consideration should be given to the impact on dignity, health and privacy of a reduced covered area. A decision to provide less than 3.5m² per person should be highlighted, along with measures to mitigate against any adverse affects on the affected population."

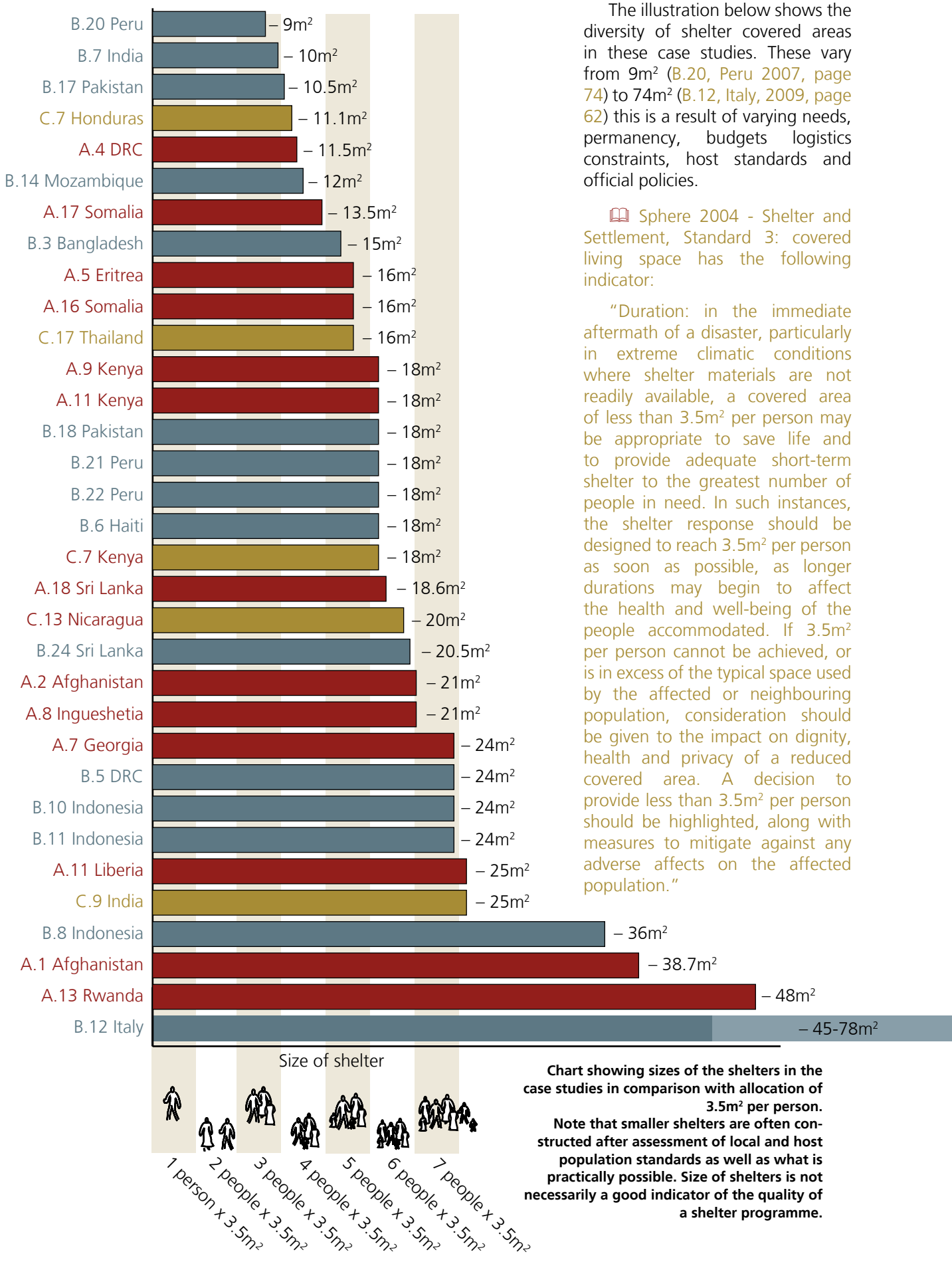


Chart showing sizes of the shelters in the case studies in comparison with allocation of 3.5m² per person.
Note that smaller shelters are often constructed after assessment of local and host population standards as well as what is practically possible. Size of shelters is not necessarily a good indicator of the quality of a shelter programme.

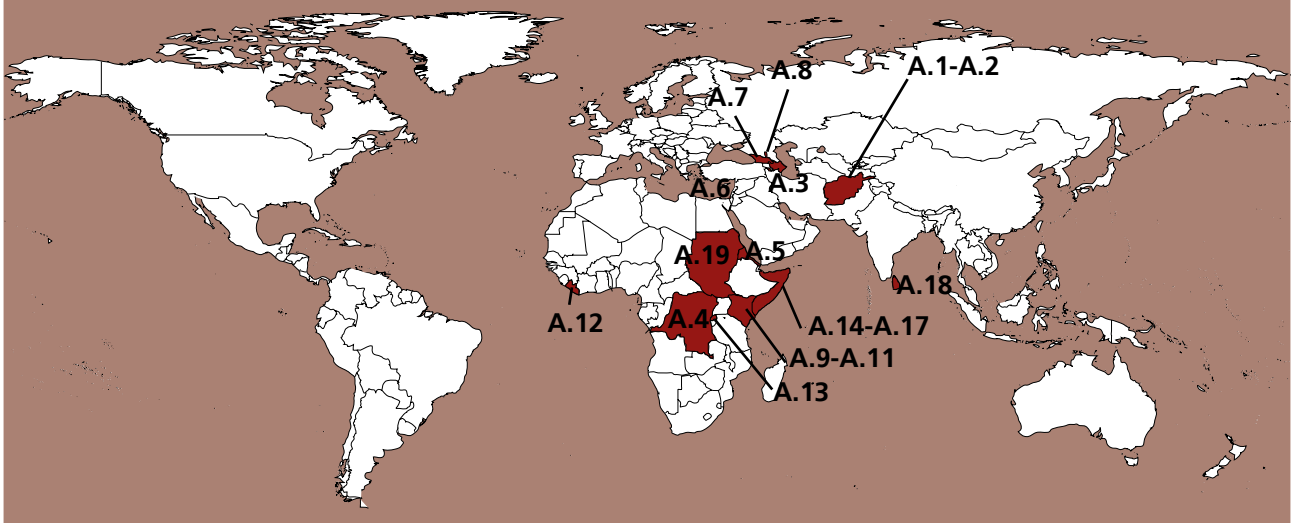
"Nero at this time was at Antium, and did not return to Rome until the fire approached his house, which he had built to connect the palace with the gardens of Maecenas. It could not, however, be stopped from devouring the palace, the house, and everything around it. However, to relieve the people, driven out homeless as they were, he threw open to them the Campus Martius and the public buildings of Agrippa, and even his own gardens, and raised temporary structures to receive the destitute multitude. Supplies of food were brought up from Ostia and the neighbouring towns, and the price of corn was reduced to three sesterces a peck. These acts, though popular, produced no effect, since a rumour had gone forth everywhere that, at the very time when the city was in flames, the emperor appeared on a private stage and sang of the destruction of Troy, comparing present misfortunes with the calamities of antiquity."

Tacitus - The Annals / Book 15 - writing in 64 AD following the fire of Rome. an early example of emergency shelter provision.

Introduction

SECTION A

Conflict and Complex Disasters



A.1 Afghanistan - 2009 - Conflict returnees

Case study: Winterisation

Full case study

Country:
Afghanistan

Disaster:
Afghanistan returns to Sozma Qala camp

Disaster date:
2009

Number of people displaced:
2002 - 2010 - over 5 million people returned to Afghanistan.

Project target population:
379 families

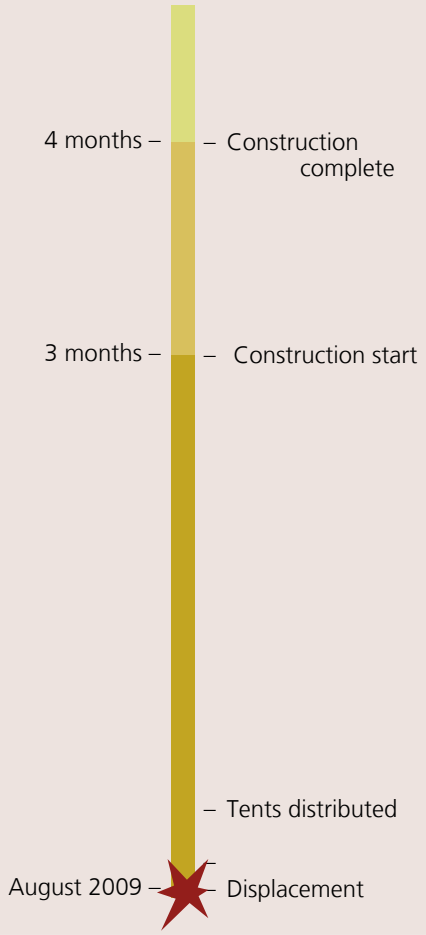
Occupancy rate on handover:
94%. 14 of the families completed 1 room mud brick shelters and used the shelters constructed by this project for general store and livestock.

Shelter size:
Covered area = 38.7m²

Materials cost per shelter:
$ 300

Project cost per shelter:
$ 910 overall budget including all additional winterisation works, project staff, transport, office accommodation, administration, etc

Project timeline



Summary

An emergency team rapidly winterised a temporary transit camp. The site was for 379 families for refugees returned from Iran to their district of origin in northern Afghanistan. To improve the existing tents, a production line was set up in the camp to build bamboo and plastic sheeting shelters, which provided additional protection from severe winter weather. The structure was developed from a model implemented in Pakistan Administered Kashmir in 2006-2007

Strengths and weaknesses

✓ These shelters allow the the original tent to continue to be used by providing additional protection against severe weather conditions.
✓ The shelters could be constructed quickly using local semi-skilled labour.
✓ Since the shelters do not use materials that may be considered permanent they send a clear message that this is a temporary emergency provision. Existing agreements with local authorities and surrounding villages regarding the occupancy of the transit camp clearly stated that this location is a temporary facility.
✓ The relatively large covered area of the shelter allows for clothes drying and safe storage of belongings as well as catering for larger family units.
✓ Ongoing assistance programmes in the area allowed a degree of monitoring throughout the winter months.
✓ Staff from the organisation continued to engage with the community throughout the winter period.
× Early expectations of the community focussed on the provision of a permanent house rather than the extended provision of another form of temporary shelter.
× An extended delivery pipeline for bamboo poles stretching from Pakistan to northern Afghanistan, meant the program was vulnerable to delays caused by insecurity, border procedures and bad weather. Over a 6 week construction period, 12 days were awaiting delivery of bamboo.
- The organisation intends to adopt a similar deployment methodology for future fast-onset emergencies in the region.

Sozma Qula Transit Camp before winterisation
Photo: Shaun Scales

Background

After the closure of a camp in Iran that had been their home for 23 years, families were returned to the Sozma Qala area of Sar i Pul province of Afghanistan. As a result of the number of years of displacement, many of the original houses and water facilities were destroyed and there were issues regarding land ownership. For the majority of the returning families an immediate return to their village of origin was not possible.

Afghan authorities in Sozma Qala approved the development of a temporary transit facility on land near to villages of return. Families would be able to live on this temporary site until durable solutions were developed.

The original transit camp facilities were built to provide temporary support and were not intended for winter occupancy. Tents were provided as family shelters and a basic water delivery system had been developed.

By October 2009 it was clear that by the onset of winter only a limited number of families would have returned to their villages.

Inadequacy of the tents had lead to the population in the camp being extremely vulnerable to the coming severe winter weather. The largest element of the winterisation program was the provision of additional shelter to ensure that families living in tents had improved shelter.

Selection of beneficiaries

A relatively late decision by the Iranian authorities to close the camp occupied by these 379 families resulted in their spontaneous return to their area of origin. Previous returns tended to be pre-planned. This had allowed time for the mobilisation of resources to receive them and the construction of durable mud-brick shelters that could later be extended into permanent dwellings.

There were few opportunities for temporary hosting by the local community until permanent dwellings could be constructed were practically non-existent. These factors contributed to the decision to develop a temporary transit facility as the first step in the return process. Family units were largely maintained in line with the households established in the Iranian refugee camp. There was some negotiation related to larger families , which was often resolved by providing of an additional small tent.

It is anticipated that Afghanistan will see more of this kind of spontaneous return throughout 2010.

Technical solutions

Bamboo structures clad in plastic sheeting were built around existing tents. Sections of the structures were prefabricated by local carpenters in a warehouse tent within the camp. They were then passed to beneficiary assembly teams for shelter construction on designated family plots.

This approach to shelter was based on learnings from previous earthquake responses in Pakistan for the winter of 2006-2007

The Pakistan design was altered to simplify the construction process and allow semi-skilled and unskilled members of the beneficiary community to assemble the shelters.

Sozma Qula Transit Camp after winterisation
Photo: Shaun Scales

Rapid construction process - materials were prefabricaetd in a wrehouswe and assembled on site
Photo Shaun Scales

The shelters were known as 'Weather Mitigating Tent Shelters' (WMTS') and were provided as a temporary shelter suitable for winter.

The relatively large covered area of the shelters allowed for the maintenance of larger family units.

The assistance delivery process was streamlined by having raw materials delivered directly to site and then processed through the warehouse tent.

Implementation

The project was implemented by a mixed gender team of emergency focal points, engineers, field assistants and logistics personnel. Staff were seconded from other programs that were managed by the organisation elsewhere in Afghanistan.

- 1 expatriate coordinator
- 2 emergency focal points
- 1 team leader
- 1 logistics assistant
- 6 field assistants
- 2 drivers

Site winterisation

Ground water pipelines were dug deeper to prevent freezing and water storage bladders positioned on platforms and protected with insulating enclosures.

Mitre drains were built to divert future snow melt into a natural gully before it reached the camp area.

A simple gravel road network allowed easier access for pedestrians and water tankers.

Additional drainage was built with the roads to divert rain and snow melt from within the camp.

Four insulated bathing enclosures (two male, two female) with 10 separate cubicles in each have been constructed adjacent to winterised tap stands.

All 379 families were issued with a local Bukari (solid fuel stove) and chimney kit with 90kg of coal as the first of four fuel distributions. These were intended to cover a 3 month period. Technical teams were active throughout the camp providing advice on the safe fitting of chimneys and the maintenance of fire breaks between shelters.

Additional winter clothing kits were also distributed to each family.

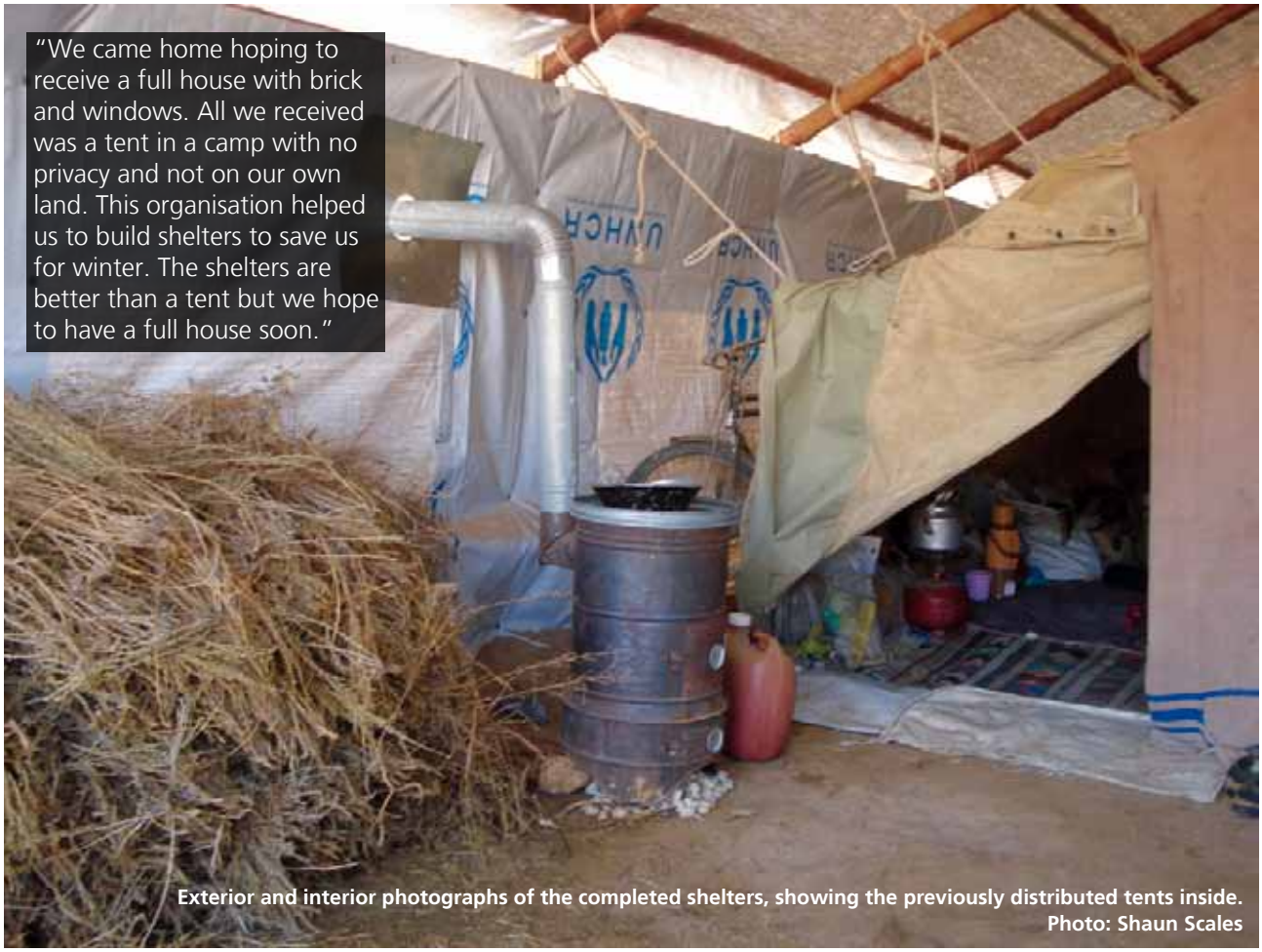
Logistics and materials

Bamboo and plastic sheeting were procured internationally and were subject to delays due to poor weather and insecurity. All other hardware materials and tools for the project were purchased locally in Mazar-I-Sharif.

Materials list for one shelter

Quantity	unit
10m bamboo poles	24pieces
Standard 5m x 4m plastic sheeting	7pieces
Plywood Sheet 6mm x 1525mm x 1525mm	4.6 pieces
Bolts - 6mm diameter 150mm long	84 pieces
Nuts for bolts	84 pieces
Washers for nuts	168 pieces
Nails – 100mm (4")	110 pieces
Small Nails – 50mm (for fixing tarpaulin)	1000 pieces
Washers for small nails (to make wide head)	800 pieces
Binding rope – 5mm cotton	60m

Finished shelter. The end wall has been covered by the occupants
Photo Shaun Scales



Exterior and interior photographs of the completed shelters, showing the previously distributed tents inside.
Photo: Shaun Scales

A.2 Afghanistan - 2002 onwards - Returns

Case study: Update - Shelter construction

See Shelter Projects 2008 for more

Project type:
Package of shelter construction materials,
self build shelters,
cash grants,
technical support

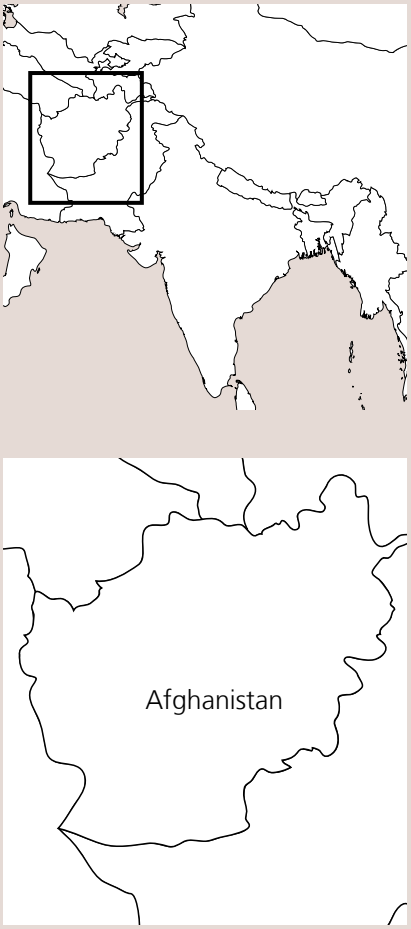
Disaster:
Afghanistan repatriation 2002-2008

Houses damaged by disaster:
5 million returnees since 2002

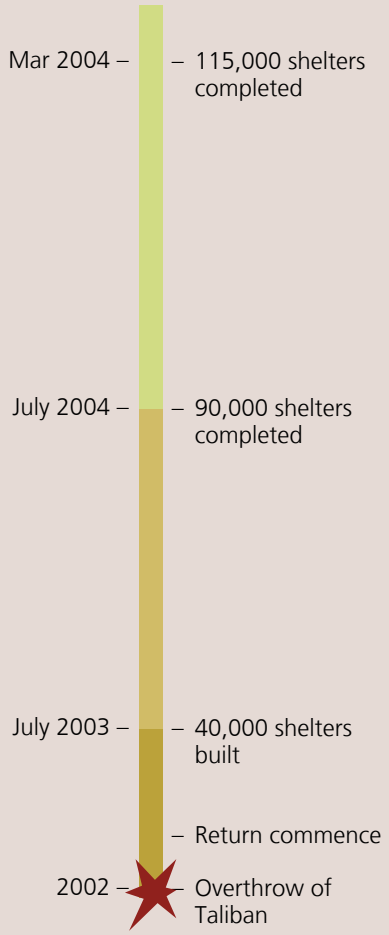
Project target population:
1.2 million beneficiaries to date (average family size of 6).
This programme has sheltered an estimated 25% of returning population

Occupancy rate on handover:
Unknown

Shelter size:
It was strongly recommended to maintain a 21m² minimum net floor area.
The shelter consists of two rooms, one corridor, and an external latrine.



Project timeline



Summary

A large scale, self-build. shelter programme implemented through partner organisations. The programme aimed to help meet the needs of the 5 million people returning to Afghanistan since 2002 over 20 years of conflict. Different shelter models were adopted around the country depending on local construction technology. This programme provided materials, basic technical guidance and cash for the most vulnerable people. It was integrated with monitoring and support for return. Escalating steel prices severely affected the programme leaving it 5 million US dollars under budget for 2008.

Update

This programme continued in 2009 and looks set to continue for many years to come. The lead organisation continued to develop detailed guidance for partner organisations. This included detailed paperwork requirements which aimed to encourage consistency between programmes accross the country. Some organisations found these too prescriptive and preferred to build shelters from other funding sources.

The shelters continued to be built in exisitng settlements as well as in new settlements. Accross the country, three main designs of shelter were developed. Minor design changes were made such as varying the amount of timber used for various structural elements. In general the use of steel I-beams in the shelters proved popular.

Projects are implemented on a one year cycle with organisations being funded for construction one year at a time. This provides an incentive for rapid and large scale construction, but can make follow on projects to re-establish communities difficult to plan, and means that shelter occupancy is not as high as it could be.

A.3 Azerbaijan - 1992 - Conflict displaced

Case study: Upgrade of collective centres

See Shelter Projects 2008 for more

Project type:
Upgrade of collective centres

Disaster:
Nagorno Karabakh conflict

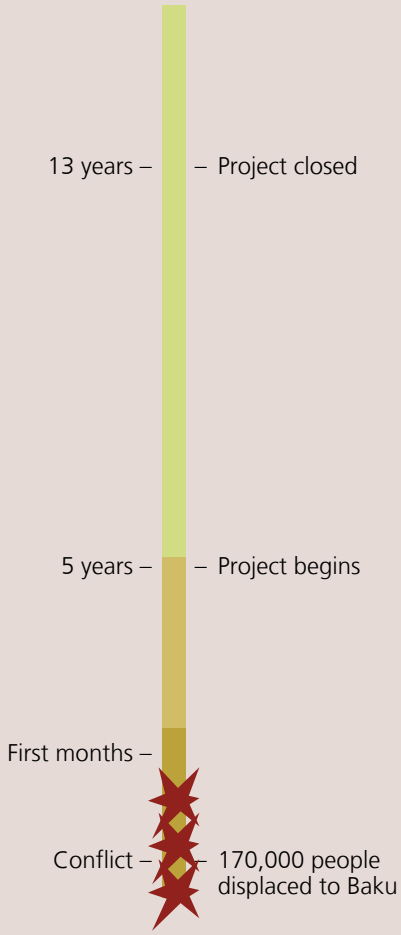
Houses damaged by disaster:
700,000 displaced
40,915 families (169,609 people) came to Baku in 1992-1993

Project target population:
27, 500 in over 60 buildings over 8 years

Occupancy rate on handover:
No data. Room allocation in the buildings is dynamic.

Shelter size
Variable. Individual rooms often shared by whole families

Project timeline



Summary

This programme upgraded and maintained public buildings that people had moved to during the conflict in Nagorno-Karabakh in the early 1990s. The project worked with families who, by the end of the project had been displaced for over ten years. The way of working evolved over time, starting with contractor led construction, evolving into direct implementation by the NGO. Although the project closed without a clear exit strategy, aspects of the project were taken up by the government in their housing policies.

Photo: NRC Azerbaijan
The project worked with families who had been displaced by conflict and were living in public buildings

A.4 DRC, Goma - 2009 - Conflict displaced

Case study: Urban host families, vouchers

Full case study

Country:
Democratic Republic of Congo

Disaster:
Ongoing armed conflict

Disaster date:
1994 - Conflict in eastern DRC 2008 - Offensive towards Goma

Number of houses damaged:
Unknown

Number of people displaced:
>100,000 for this phase of the conflict. Millions cumulatively over the previous 16 years.

Project target population:
250 'solidarity' families

Occupancy rate on handover:
100% on project completion.

Shelter size:
11.5m² extension to existing houses.
Increase from 1.5m² per person to 2.25m² per person.

Materials Cost per shelter:
680 USD for shelters, latrines and labour.

Project cost per shelter:
250 USD per person, inclusive of operational / support costs.

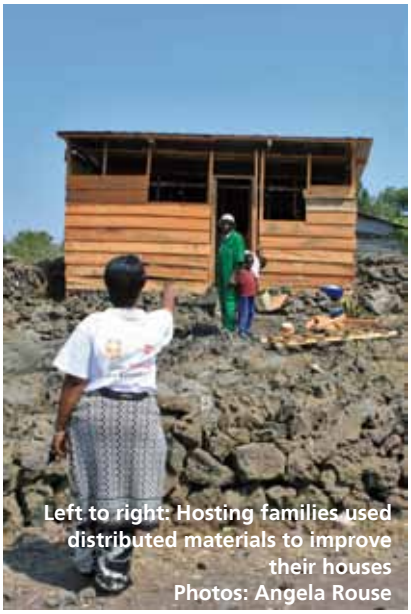
Project timeline

Summary

Multi-sectoral support to 'Umoja' (solidarity) hosting and hosted families following an influx of displaced people into Goma. Families were provided with materials for either repair or additions / extensions to existing housing, as well as key household items using a voucher system.

Strengths and weaknesses

✓ An alternative to camps was found, and at a lower cost.
✓ Both hosting and hosted families were given a large degree of control
✓ The communities themselves, as well as the authorities and local groups and churches were very involved in the project design and its implementation.
✓ A significant number of the families hosted total strangers. In some cases the hosting family was from a different ethnic or linguistic background than the hosted family. This showed the spirit of Umoja.
✓ Livelihoods of the displaced families were supported through the provision of more secure shelter closer to areas of high economic activity.
✓ Families were able to get the supplier to substitute some materials for a better quality at the same price.
✓ Tensions between host and displaced communities were reduced.
× Initially, many vendors dropped out, making prices for food and shelter items difficult to control. This was later resolved.
× As this was a pilot project, high levels of monitoring and involvement by senior management staff were required.
× High levels of sensitization and monitoring were required
× The project was not supported by pooled funding as it did not fall into pre-defined categories such as Camp Management or Early Recovery.
- Exisiting houses were smaller than 3.5m² per person. The shelters built by the project respected this to reduce the risk of tensions arising.
- This project was not linked to any formal urban or regional planning.



Left to right: Hosting families used distributed materials to improve their houses
Photos: Angela Rouse

Before the displacement

There have been multiple large-scale forced displacements of population in Goma since the Rwandan Genocide of 1994. There was also large-scale displacement following the volcanic eruption in 2002.

Prior to the conflicts, the population of Goma had been estimated at less than 50,000 people, but by 2008 the population estimates had reached more than 800,000. For the two neighbourhoods in Goma chosen for the project, both were within the city limits. One, Kasika, had been created in a planned manner, whilst the other, Ndosho, was less planned. Both areas had suffered stresses on infrastructure and water resources before the disaster.

After the displacement

Since 1994, population displacement through conflict has been pendular, with families often moving relatively short distances from their homes, and then returning again, once the levels of insecurity had fallen. However, the approach of the rebels between October and November 2008, and the subsequent fighting in other close-by areas in early 2009 meant that many families would not be able to return home rapidly, and that they would need support for a longer period of time.

The humanitarian community, with the United Nations and the government, were able to provide spaces inside planned camps for 69,000 people. This was not sufficient for the entire displaced population. It also required much funding and resources. The camp locations, outside the city, meant that the displaced families had less access to livelihoods, and less likelihood of achieving any economic independence.

Of those who did not reside in the camps, but who looked for shelter in the city, almost all found shelter with host families. This was arranged through relatives, through introductions, through church associations and through other mechanisms. Some families were hosted for free, whilst others paid rent. In the majority of cases, indoor space for the hosting and the hosted families was greatly reduced, and strains increased as time went on.

Implementation

A multi-sectoral approach was chosen, to support the 'Umoja' or 'solidarity' of the families who were hosting or hosted. As a pilot project, two neighbourhoods were selected, where a large number of displaced people were living with host families. Key needs, including those of shelter and non food items, were identified through consultation with affected communities.

It was decided to give as much choice as possible to enable the families to choose items that they needed. As a result a voucher scheme was implemented.

Selection of beneficiaries

The organisation worked with a committee that included members of both the hosting and the hosted families. These committees created a list of vulnerabilities, and prioritised or weighted each different category in the list.

The Chef de Quartier provided a list of solidarity families, which were then visited and weighted against various vulnerability indicators. The most vulnerable families were then retained as beneficiaries. Lists were displayed to allow the community to pick out any fraudsters. The committee was very involved in the whole process.

Technical solutions

Standard designs were created before the bill of quantities was finalised. These designs were created through the community consultation process, and then shown to the selected families before construction.

However, as houses had different designs, and plots varied, families were given flexibility in the design that they built. Some families used the materials to repair houses, whilst others used them to build extensions.

For the distribution of household items and food, a voucher scheme was used, in co-operation with a number of selected local merchants. The merchants then returned the vouchers to the organisation for payment. Certain items, such as. alcohol, could not be purchased using the vouchers, but otherwise a wide range of items, including mattresses and cooking utensils, was made available to the beneficiaries.

At first, many of the merchants were hesitant about the scheme, but were finally won over. However, at the same time, there were accusations that some of the merchants were over-charging, above the fixed prices that had been agreed with the organisation.

A team consisting of committee members and staff from the organisation monitored the use of vouchers. Families were encour-

aged to barter or leave the shop if prices were too high.

Logistics and materials

The food and shelter items were identified as being a priority during the community consultation process. Vouchers were then issued for redemption at approved and selected local merchants. A previous market analysis conducted by the organisation ensured that the local markets would be able to provide all the items. The logistics for the household items was entirely undertaken by the merchants themselves.

The method of distribution of the shelter construction materials was the subject of much discussion with those receiving them. Initially many did not want distribution directly to their homes, as this might incite jealousy from the neighbours. Additionally, the informal layout of the neighbourhoods, and the rough lava-rock surfaces made it difficult for trucks to access all of the target areas.

In the end, two distribution points (one in each of the two communities) were selected for the construction materials. Most of the materials were sourced locally, with an acknowledgement that sourcing timber from sustainable resources is particularly challenging in DRC.

Materials list

Material	Quantity
Wooden Plank	42 pieces
2" x 2" wood beam	32 pieces
CGI sheet BG 32	8pcs
Cement 50Kg	3 sacks
Sand	1.09m^3
Rough sand	0.55m^3
Roofing nails	1kg
10 cm nails	5kg
8 cm nails	6kg
6 cm nails	6kg
4 cm nails	0.5kg
Door with accessories 80/180cm	1
Window with accessories 60/40 cm	2
Wooden plank 2" x 4" (50mm x 100mm)	6 pieces
Plastic sheet	1 pieces
Wood preservative oil	5litres

"When they came with the vouchers, we bought a mattress and sheets, and this pot. We never had a mattress before!

Now we have building material... We have knocked the old house down, and are using the old and the new material to build a bigger house."

The chef de quartier had put us on a list, and after some months the organisation came with many questions. In April we got vouchers to buy food, and for mattresses, blankets and pots. We now cook in our own house.
We got more food vouchers in May, and last month we got building material to build an annex to the house. This is very nice and gives us our own space. We built it together in three days, but we still have to put the floor in.

Materials distribution and construction for the host family support programme in urban environemnts in Goma
Bottom: The building on the right is the extension built during the programme.
Photos: Angela Rouse

A.5 Eritrea - 1998 onwards - Conflict

Case study: Update - Camp upgrades

See Shelter Projects 2008 for more

Project type:
NFI distribution
Camp support program
Fuel efficient stove project

Disaster:
IDPs in camps in Eritrea following Eritrea / Ethiopia conflict

Houses damaged:
Estimated 100,000 homes were destroyed in the war.

Number of people displaced:
In 2000, around 1,000,000 were displaced in Eritrea.

Project target population:
Varied over time.
The camp population in Gash-Barka, Debub and the Red Sea states region stabilised to 60,000 by 2001.

Occupancy rate on handover:
Varied over time.

Shelter size
Tents provided 16m² of covered space. Some families had modified their shelters to provide up to 40m².

Project timeline

- 10 years – 10,000 IDPs remain in camps
- 9 years – Support for return begins
- 6 years – 60,000 IDPS remain in camps
- 3 years – Returns begin
- 2 years – Ethiopian troops withdraw
- Peace deal
- Truce
- 2 years – Hundreds of thousands of people displaced.
- First distributions
- May 1998 – War between Ethiopia and Eritrea starts

Summary

Support for variable population of Eritrean IDPs following conflict with Ethiopia. The agency in this case study was the main provider of shelter and NFI assistance, providing IDPs with tents, tarpaulins and other non-food items such as stoves to those living in camps in the three areas of Gash Burka, Debub and Red Sea states. The provision of durable shelter items was not possible due to a political interests in ensuring that the camps were temporary. As a result IDPs often adapted the emergency shelter items they received in order to improve their living conditions.

Update

By mid-2008 Eritrea, officially, there were no conflict displaced people in Eritrea. The government had resettled the last 11,000 living in camps in Debub. However, United Nations Development Programme in Eritrea reported in January 2009 that an unspecified number of displaced people were still living with host families.

In 2007 concerns were raised over the level of services provided in return areas and whether settlements would support returnee livelihoods and one agency requested donor funding to support 10,000 returnees with emergency items and basic services.

The government of Eritrea has provided cash grants and assistance with home-building and seed/livestock buying to some returnees. Some families received two hectares of land and the regional administration had disbursed over three million Nakfa ($200,000) by the end of 2008.

Over 60,000 people were living in camps 6 years after the conflict
Photo: Joseph Ashmore

A.6 Gaza, Palestine - 2009 - Conflict

Case study: Shelter assessments

Full case study

Country:
Gaza, Palestine

Disaster:
Conflict – "Operation Cast Lead" the war on Gaza.

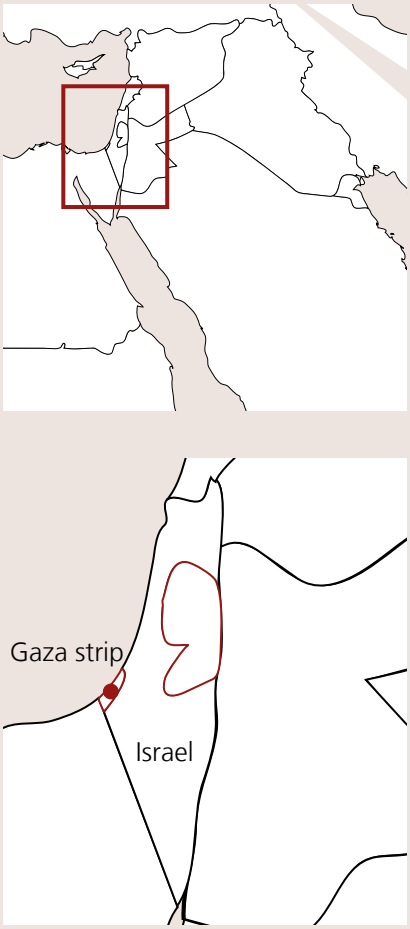
Disaster date:
December 27, 2008 to January 18, 2009,

Number of houses damaged:
60,000 shelters

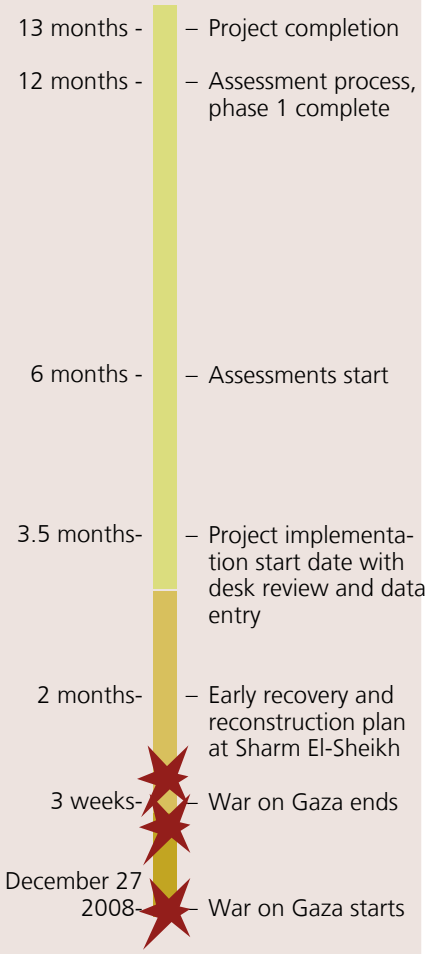
Project target population:
Over 12,000 assessments were conducted and 8,947 houses were real cases.
5,039 cases were deemed to be eligible for the grant.
29,420 persons had applied for cash assistance.

Occupancy rate on handover:
Not applicable as there is no handover

Shelter size:
Variable cost paid per shelter - Average of 68,000USD per house paid for destroyed houses, 14,750 for damaged houses and 1,800 for minor damage to houses.



Project timeline



Summary
The organisation implementing this project advised on the allocation of grants from families whose houses had been damaged or destroyed by the invasion of Gaza. 12,000 assessments were carried out with 5,000 found to be eligible from 29,000 applications. However, the blockade on Gaza meant that materials were not available for families to rebuild their homes.

Strengths and weaknesses

✓ Programmes were able to adapt to the changing context.
✓ Detailed assessments of 12,000 houses were conducted in Gaza. There is now detailed damage assessment on the basis of which future payments can be made.
✓ By assessing apartments separately from the main structure of a building, those renting would also be supported by future cash payments.
✓ All houses were assessed, including houses occupied the poorest families.
× Because much of the support early in the response had gone to families in collective centres and camps early, it was difficult to encourage return.
× No housing repairs were made as a result of this program. This was due to an Israeli blockade on construction.
- Due to lack of construction materials, the project had to be stopped after finishing the cost assessment.
- The cash component of the project that was planned, was intended for the purpose of building repair and construction. As construction could not happen, no payments could be made.

Destroyed buildings
Photo credits: CHF

Before the conflict

The Gaza strip is very densely populated. Its current population is 1.5 million with over 4000 people per square kilometre. It has a high rate of unemployment and as a result poverty is pervasive. This was exacerbated by the blockade on Gaza, which started in June 2007. This blockade prohibits many items including building materials from entering Gaza.

In 2008, over 5,000 houses were under construction through internationally supported projects. Projects in the housing estates for refugees from 1948 were not complete, and an estimated 20,000 new housing units were needed in Gaza each year to accommodate natural growth. Additionally there were refugees living in unsanitary conditions in camps.

After the conflict

For 23 days starting on 27 December 2008, the Israeli Army carried out a major military operation in the Gaza Strip which they called "Operation Cast Lead". The military incursion led to high levels of damage to shelter, public services as well as economic infrastructure. Blockades on goods, including cement, timber, steel, glass, and other construction materials were still in place one year after the military action.

The conflict damaged or destroyed 60,188 shelters of which 10% (6,000 shelters) were destroyed or required major repair. 600,000MT of rubble needed to be dealt with.

The response

The emergency response was to distribute relief items. These included plastic sheeting to cover windows and damaged walls, kitchen sets, mattresses, blankets and hygiene items. Cash was also distributed to families, although a physical shortage of money in Gaza slowed down initial distributions.

Cash assistance was the major element of the response to the disaster. The de-facto government in Gaza handed out 4,000 Euro to each family who had their homes destroyed, and The Palestinian National Authority through the United Nations Development Programme handed out 5,000 USD to each family with a destroyed home and 3,000 USD to each family with major damage. People with less than 3,000 USD worth of damage received full compensation.

The same process was carried out for the refugees through the United Nations Relief and Works Agency. by the end of the conflict, over 50,000 people had found refuge in over 50 collective centres, many more had moved in with host families. Following the end of conflict, the number of families in collective centres rapidly fell as people moved in with host families.

Where buildings had many tennants - different apartments were assessed separately from the building
Photo credits: CHF

After the invasion, the Palestinian National Authority initiated a housing rehabilitation and reconstruction program for all residents affected by the war on the Gaza Strip. This included both those displaced and those living on their original tract of land. The funding would be issued to home owners by grants through Palestinian banks which operate in the Gaza Strip.

Families had to apply to the banks to receive an amount of money that could be dedicated to rebuilding homes, or to constructing new residences on legally owned lands.

Implementation

The organisation in this case study had a technical advisory role. The ultimate authority for allocation of grants was held by a committee. This committee included the Palestinain National Authority, the Palestinian Monetary Authority and the participating banks. The project was planned in two phases:

- Phase 1: The compensation value would be calculated which would be issued to home owners in the form of grants through Palestinian banks which operate in the Gaza Strip.
- Phase 2: To monitor the distribution of cash and serve as an advisor to the banks, authorising payments to beneficiaries. This phase did not happen as the blockade prevented construction materials from entering the Gaza strip.

The organisation reviewed approximately 29,000 grant applications and assessed the homes of 12,000 people. Assessment forms were entered into a database with linked GPS data, and an overall cost for required repairs was computed for each home.

Repair costs for each home were calculated through an agreed and transparent method. This was based upon an estimate for the cost to replace or repair each type of damaged building element (such as column, footing, slab, floor or even a whole building). During assessments, detailed information such as the volume of concrete, excavations, backfilling and steel required was recorded according to pre-agreed reference tables.

Categories of damage

- Category 4 - totally destroyed, or more than 70% of the home is damaged
- Category 3 – value of destruction greater than 5,000 USD
- Category 1 or 2 - minor damage and the value of the destruction is below 5,000 USD.

Damage was further categorised into apartment damage and damage to the common parts of a building. This was to enable tenants of multi-storey structures to qualify for assistance.

Selection of beneficiaries

Families had to apply through the banks. Eligible families included

- Non refugee Palestinian citizens in Gaza Strip whose buildings were completely destroyed or who suffered from major damage that made the house unsuitable for living in, and who had a house in category 4 and 3
- Palestinian refugees living outside the refugee camps in Gaza Strip. As of June 2010, the selection of these refugees outside the camps and the value of their grants needed to be discussed between the Palestinian National Authority and the United Nations Relief and Works Agency.

Buildings had to have been occupied before the war.

each building was visited by a team
Photo credits: CHF

Structural assessments required skilled engineers
Photo credits: CHF

Damage assessment

Three different damage assessment methods were identified. Each had corresponding forms and paperwork.

Category 1: repair is not feasible. Assessment teams must collect additional data such as area of the building, the number of floors, original drawings or photos of the building and type of finish.

Category 2: damage is too complex. A specialist team is required to assess the damage. This was most common for multi-story buildings where there was damage to slabs or structure in lower floors.

Category 3: partial damage or rehabilitation is feasible. Three categories were established: excessive, moderate or minor damage.

Staffing

To visit all of the 29,000 homes in 9 months, a team of over 160 skilled people was assembled. This is summarised below

no.	role	years experience
96	Site Engineers: Civil Engineers and Architects	≥ 5 years
9	Roving Support Engineers (Electrical and Mechanical Engineers	≥ 7 years
16	Supervising Site Engineers (Structural Civil Engineers	≥ 7 years
5	Chief Engineers (Civil Engineers)	≥ 10 years
10	Social Workers (Councillor training background)	≥ 5 years
8	Office Engineers (Civil, Architect, Electromechanical)	≥ 7 years
20	Graduate engineers who were paired with more experienced staff.	graduate engineers
1	Program Deputy Director (Civil Engineer)	≥ 15 years
1	Program Manager (International Expert).	

Surveyor Teams were established, each one including two site engineers with a target of assessing 3 to 5 housing units each day. Every Site Supervisor was responsible for 3 surveyor teams.

Each Chief Engineer had between 3 and 5 Site Supervisors reporting to them. This meant that they reviewed between 45 and 75 data collection sheets per day. Chief Engineers took a random sample of 5 data collection sheets from each Site Supervisor for review each day.

Finally the data was approved by the Programme Manager and Programme Deputy Director and handed to the banks.

Payment

The intention was that once the payment phase of the programme had started, the owner of each property would conduct their own reconstruction. For this, they would be paid a cash grant in installments.

However, after one year, construction still could not take place due to the blockade on construction materials into Gaza by the Israeli authorities.

NOTE: One year later, the money pledged at the Sharm el-Sheikh conference for the reconstruction of the Gaza Strip had not been handed over to the Palestinian National Authority. There needed to be a political resolution between the two different governments in Palestine and an end to the siege by Israel before the donors would hand over the pledged money.

A blockade on construction materials prevented houses from bein built.
Photo credits: CHF

A.7 Georgia - 2008 - Conflict

Case study: Rural shelter construction

Full case study

Country:
Georgia

Disaster:
Conflict

Disaster date:
8-12 August, 2008

Number of houses damaged:
1,850 families (mainly single-family houses. some multi-unit apartment buildings)

Number of people displaced:
120 000—130 000

Project target population:
Initially 5000 households. Later reduced to 200 households.

Occupancy rate on handover:
Initial occupancy rate 65%. Later increased to over 80%.

Shelter size:
The materials distributed were to repair houses of varying sizes. The transitional shelter cottages were 24m^2.

Materials cost per shelter:
Varied for building repair. 3000 USD for each winter cottage.
Costs were higher for the 'One warm cottage'.

Project timeline

Summary
Support of families whose homes had been damaged or destroyed during the conflict, in order that they could stay in their homes during the first winter. Building repairs and then the provision of a 'one warm cottage' was supplemented by distributions of NFIs and firewood.

Strengths and weaknesses

✓ Support allowed returnee families to stay in their homes during the harvest season, and during the winter.
✓ The number of families having to stay in collective centres was reduced.
✓ Forward preparation was made for full reconstruction after the winter.
✓ The NGO showed great levels of adaptability to changing government policies.
✓ The project made extensive use of beneficiary contribution and input.
✓ 'One warm cottage' provided a long-term solution for those whose homes had suffered the most damage.
✓ Local markets and contractors were engaged.
✓ Cottages were built that would be of use to families evan after they had ceased living in them.
× Constant changes in government policy forced shelter projects to adapt continuously.
× 'One warm cottage' used resources which could have been used for permanent repairs of original houses.
× 'One warm cottage' construction not as adaptable as initial 'one warm room' repair strategy.
× Limited size of 'one warm cottage' was not always able to provide sufficient space for extended families.
× Need for accelerated speed in construction of cottages reduced potential for reconstruction of improved houses and technical knowledge transfer.
- Targeting of the most severe levels of damage ensured that those most in need of shelter were supported, but the increased costs of doing so meant that fewer households could be supported, and almost none whose houses had suffered a mid-range of damage were given support.

The housing strategy shifted from "one warm room" to "one warm cottage." As a result the anticipated scale of the programme was reduced
Photo: Jonathan Puddifoot

Before the conflict

Georgia had a pre-existing displaced population of approximately 200,000 people. Many had been living in collective centres in urban areas since the conflict of 1991-1992.

Apart from a few families living in apartments in the centres of the largest villages, most families lived in stand-alone farm-houses. Often these were shared between many generations of the same family.

Most of the houses were grouped into small villages, and stood alone inside walled gardens. Most families still relied upon agricultural produce for their livelihoods to some degree, and most houses included storage rooms in the bottom storey.

Houses built after the 1970s were more likely to be built in breeze blocks. Almost all of the families in the affected areas were owners of their own homes.

Since 1990 there was a dramatic decline in the local economy. This added to the vulnerability of the housing stock to conflict damage.

Temperatures in the affected zones fall as low as minus 20^0 Celsius in winter. Houses in the area were built under the Soviet regime, when energy was virtually free to users, and as a result many had very poor thermal insulation. For 97% of households firewood is the main fuel for heating and cooking. The average family consumes $7m^3$ of wood during a winter.

Between the 8th and 12th August 2008, South Ossetia was invaded. Russian forces continued 26 kilometres further south. At the ceasefire on 12 August, a 'buffer zone' was declaed at the perimeter of the furthest advance. This zone was occupied until October 2008.

After the conflict

During the first three weeks of the ceasefire armed militia gangs roved the villages inside the buffer zone south of South Ossetia. Once that threat diminished, a greater number of families from the villages in the buffer zone started to return home.

By the second week of September in some villages, 70% of the population were either permanently returning home, or spending at least part of the time back in their homes. The return process coincided with the start of the harvest season.

A relatively small number of houses (only 5% of the total) had been destroyed or heavily damaged. However, up to 2483 houses in the 11 most heavily-damaged villages had suffered sufficiently light damage that the families could stay in the houses over the winter.

In urban areas beyond the buffer zone, greater strains were becoming evident in the ad-hoc collective centres for those who had been displaced and who could not return. There were also competing claims for support from those newly displaced, and the older displaced population from the 1991-2 conflict, as well as those fleeing from South Ossetia for whom return was impossible.

One warm room strategy

Within one month after the disaster, the implementing organisation had developed a 'one warm room' strategy, based upon previous models from the Balkans in the 1990s. The most important element of this strategy was that it would support those families who wanted to return to their houses of origin, and thus relieve pressure upon the collective centres in urban areas like Tbilisi. It aimed to provide support to the families who were seeking to return home in time to salvage their agricultural harvests.

The organisation also continued to support people that were displaced into urban areas through the distribution of firewood and non food items.

"One warm room"

Trained staff would assess the levels of damage, and then engineers would draw up Bills of Quantities for those houses where repairs needed more than plastic sheeting or other minor items. A voucher system would be set up with local suppliers in Gori, the provincial centre just south of the buffer zone. This would support the local economy and ensure that as wide a range as possible of materials was available.

Housing damage was assessed on a scale of 1 to 5, based on similar scales used in the Balkans. For larger houses, there was the possibility of providing sufficient materials to prevent further damage to the rest of the house during the winter.

A cost limit per house was imposed for each category, This was to ensure equitability between households. Whilst this approach would be sufficient for those whose houses had been merely damaged, neither the time nor the budget constraints would have permitted the re-construction of an entire warm room in those houses which had been wholly destroyed.

"One warm cottage"

On October 22nd, initial engagement with the affected communities was underway, the Government of Georgia changed policy: primarily destroyed houses (category 5) would be targeted. These families would be given a 24m^2 cottage, constructed by the NGOs. This solved the issue of how to support those with destroyed houses, but reduced the number of beneficiary households supported by the NGO to 200.

Selection of beneficiaries

Initial surveys had identified the villages which had suffered the most damage. Village leaders were approached, and asked to organise a meeting between the NGO and all members of the community whose houses had been damaged. At the meeting, families were registered, and asked to evaluate the level of damage of their houses.

During the initial 'repair' part of the strategy, support was offered to families according to levels of damage. Extra help for both rubble removal and repairs was offered to those whose vulnerabilities prevented them from doing this work themselves.

When the strategy changed towards the construction of a one-room cottage, criteria changed. All families in the target villages whose houses had been assessed as being Category 5, or completely destroyed, were then included.

Technical solutions

Initially, the proposal was for a supply of materials, based upon individual bills of quantities written by staff engineers. These would provide each family with at least one warm room for the winter in their house of origin, and would be the start of the full reconstruction after the winter.

For those whose houses had suffered minor damage (typically, broken windows or roofing tiles) there would be a direct distribution of plastic sheeting. For higher categories of damage, a voucher scheme was planned, based on a market assessment, the limited logistics resources for direct delivery, and traffic limits in the buffer zone.

After the change in shelter strategy by the government, local contractors were engaged to build the 200 cottages for those families whose houses had been totally destroyed, or damaged beyond repair. The cottages were built using breeze-blocks and timber- and geo-textile roofs. There was little ground insulation. Buildings had a ceiling to improve thermal comfort.

Cottages were sized to respect international standards, whilst still having enough room to actually do the construction in the limited spaces of beneficiaries' gardens.

The government made cash transfers of around 15,000USD to families whose houses had been completely destroyed. However, due to lack of experience and support, much of this money was not spent on rebuilding houses.

Household energy

It was agreed to supply 3m^3 of firewood to support affected families with their heating and cooking needs. The organisation delivered around 24,500m^3 of firewod to around 8,500 Households, over two winters.

The organisation supplied USAID-approved fuel-efficient wood buring stoves to all cottages. It also supplied 5,952 cooking gas cylinders and 600 electric water heaters. Glass fibre insulation was provided to reduce heating costs.

Trials on woodchip briquettes as an alternative fuel found them not to be inappropriate as they were very sensitive to damp.

One of 200 'one warm cottages' built by the programme, Photo: Jonathan Puddifoot

Logistics and materials

Plastic sheeting and firewood were provided using rented trucks.

For the second, 'one warm cottage' strategy, the contractors were responsible for their own materials supply.

To reduce the risk of causing significant deforestation the organisation only bought wood from licensed suppliers, with particular criteria such as diameter and species type. Unfortunately, the large scale purchases distorted the markets. Supply licenses were suddenly revoked by the government and only a very few suppliers were able to obtain certification.

In general, although NGO access into the buffer zone was limited until October 2008, local Georgians were allowed to drive trucks into the area from a much earlier date, and after the ceasefire of 12 August 2008 transport on the national highways and from other countries was relatively unimpeded.

Materials list

Materials for one 'warm cottage' (excluding electrical installation)

Material	Quantity
Cement	3.36MT
Gravel	6.325m^3
Iron bars 12mm	102.4m
Iron bars 6mm	72m
Mineral wool - roll	1
Nails	8Kg
Roofing nails	200 pieces
Plastic boards 12.5cm	22.5m^2
Plastic door block	1.89m^2
Plastic window blocks	3m^2
Roof trim	8m
Roof sheets	25 pieces
Sand	4.6m^3
Small blocks 20x20x40cm	665 pieces
Timber beams and planks	3.5m^3
Wooden skirting	18.4m

A.8 Ingushetia - 1999 - Conflict displaced

Case study: Cash for shelter: host families

See Shelter Projects 2008 for more

Project type:
Cash grants to assist host families to shelter displaced people in private households

Disaster:
Displacement following second conflict in Chechnya, 1999

Shelter needs:
At the peak, 213,000 people fled to Ingushetia. Up to 150,000 people were accommodated by host families.

Project target population:
Winter 2000/01 – 15,000 host families.
Winter 2001/02 – 11,000 host families.

Occupancy rate on handover:
100% of the host families accommodated an average 5 IDPs from Chechnya.

Shelter size
Cash grant was equivalent to a one month local salary.
21m² minimum floor area was recommended. Shelters have two rooms, one corridor, and an external latrine.

Project timeline

- 29 months – End of the project
- 25 months – Verification of beneficiaries and disbursement of cash grants
- 22 months – Registration of beneficiaries
- 20 months – Assessment
- 12 months – Verification of beneficiaries and disbursement of cash grants
- 9 months – Registration of families
- 5 months – Assessment conducted
- Displacement starts
- Autumn 1999 – Conflict begins

Summary

An international donor, in close cooperation with the leading international agency for shelter assistance in Ingushetia, provided cash grants to every family that was hosting displaced people from the conflict in neighbouring Chechnya. The project goal was to prevent IDPs, who were being accommodated by host families, from being evicted during winter. This was acheived though provision of cash grants to all registered host family in Ingushetia

A one-off cash grant, roughly equivalent in value to a one month's income, was given with no restrictions to host families. The programme was implemented by the donor in close cooperation with the government of Ingushetia. The Ingush branch of the Russian postal service made the cash payments.

After a successful implementation during winter 2000/01, it was decided to implement a second phase, since the situation for displaced people in Ingushetia had not improved.

Left: by supporting host families with one off cash grants, the project aimed to avoid evictions
Right: cash for shelter collection point
Photo: Mathias Rickli

A.9 Kenya - 2008 - Conflict displaced

Case study: Transitional shelter kits

See Shelter Projects 2008 for more

Project type:
Pilot provision of transitional shelter kits
Technical support in building
Full-construction for vulnerable households

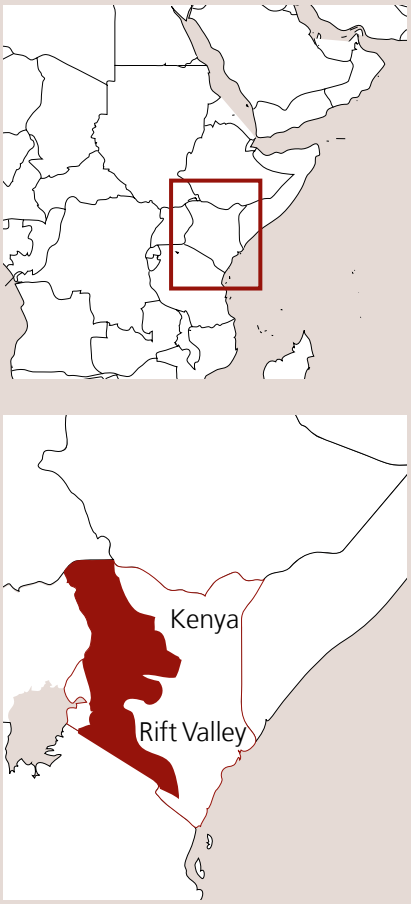
Emergency:
Kenyan election crisis, 2007-2008

Number of people displaced:
125,000 - 250,000 people found shelter in camps and similar settlements.
300,000 estimated to have moved in with host families.
12,000 fled to Uganda.

Project target population:
481 transitional shelters kits were provided as a pilot project.

Occupancy rate on handover:
86% (those not occupying wanted to wait until the shelter had been upgraded with stronger walls or until other family members returned.)

Shelter size
18 m^2



Project timeline

- 8 months – Pilot completed with final distribution
- 7 months – Pilot construction begins
- 6 months – Selection of families and training of local craftsmen
- 4 months – Design and testing of transitional shelter model
- 3 months – Final draft of Transitional Shelter Strategy
- 1 month – Power-sharing agreement
- Dec 2007 – Presidential election results spark conflict

Summary
Provision of transitional shelter kits as a pilot project in the Rift Valley of Kenya, before upscaling to a national response. Shelters were designed to be adapted by beneficiaries into permanent homes and, except in the case of vulnerable households, were erected by the beneficiaries themselves.

Update

At the end of 2008 the government claimed that only 10,000 displaced people remained in camps, though civil society and the media say 80,000-100,000 is more accurate. It has been alleged that more than Sh200 million (approximately 2.5million USD) has been diverted away from the displaced people.

"Operation Return Home", launched in May 2008, was criticised for violating the 🕮 Guiding Principles on Internal Displacement. In some cases water supplies were cut off in camps on land such as sports grounds before some displaced people felt safe to return, in order to meet the operations target for monthly return.

The Ministry of State for Special Programmes states that 78,254 households were destroyed in the violence. By mid-2009 a third of beneficiaries had received the Sh25,000 (around 300 USD) shelter assistance grant. The total number of shelter units planned by all partner agencies is 50,750. 16,345 were completed as of 28 May 2009.


Transitional shelter built on the family's own land
Photo: Mark Lawler

A.10 Kenya, Dadaab - 2009 - Conflict refugees

Case study: Update - Shelter construction

See A.11, Kenya, Dadaab - 2007-Flooding page 24 for more

Country:
Kenya

Disaster:
Conflict – Somali refugee influx

Disaster date:
Ongoing since 1991. Last update report in 2008

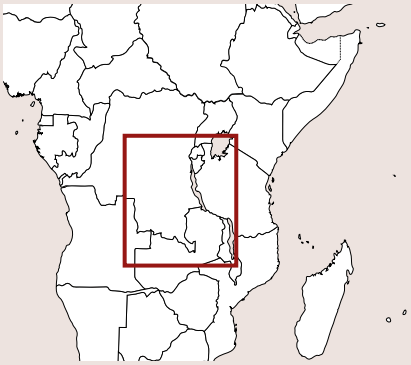
Number of people displaced:
Total 250,000 in the camp. 50,000 new arrivals to the camp since 2008

Project target population:
Up to 3500 households per year, for an ongoing project

Occupancy rate on handover:
100%

Shelter size:
18m². 6m x 3m interior space

Materials cost per shelter:
480 USD



Project timeline

- 2010 – 3500 shelters planned by the NGO.1000 Further shelters planned by other orgaisations
- 2009 – Number of shelters per year is 1500
- 2008 – Number of shelters per year is 800
- June 2007 – First mud-block shelters built
- Jan. 2007 – Start of camp extension at Ifo
- Greater numbers of refugees entering camp
- 1991 – Conflict start

Summary

Existing construction programmes were continued and scaled up. Following previous years' shelter activities, a full evaluation of the number of shelters that could be built was conducted. It was agreed that security, logistics, and availabilty of sustainable materials limited construction to 3500 shelters per year as a maximum.

Strengths and weaknesses

✓ Environmental issues were given consideration as an integral part of the project

✓ Beneficiaries were given larger internal space than available in tukul tents

✓ Longer lifespans of shelters and reduced amount of timber has positive impact upon stresses to the local environment.

✓ The construction of the shelters has created a complex secondary economy for people such as brick-makers and mouldmakers.

✓ Innovative projects have been created with sustainable environmental benefits for members of the host community connected with the shelter programme for refugees.

✓ Shelter type has very good acceptance by the refugee population, with some households making the mud blocks even before being formally registered A number of shelters have been adapted by the beneficiaries to provide space for a variety of livelihoods.

× Project is limited by the availability of suitable sources of mud, and by the limited supply of water. Difficulties remain in finding sustainable sources for timber.

× Limits on locally available materials cause larger per-unit costs for transportation.

- Targeting of most severe levels of damage ensured that those most in need of shelter were supported, The increased costs of doing so meant that fewer households could be supported, and almost none whose houses had suffered a mid-range of damage could be given support.

Shelters showing their plinth that provides protection from flood water
Photo Left: Jake Zarins
Right Jim Kennedy

Shelter in Dadaab camp

The start of the programme was reported in Shelter Projects 2008. Since 2008, the situation for many families living in Somalia has worsened. At the same time, a small number of refugees from South Sudan have been able to voluntarily repatriate. Consequently, the population of Dadaab camp has increased from 200,000 to approximately 250,000, with an estimated influx of 5000 new arrivals per month.

Although some of these new arrivals are accommodated in extension blocks in new sections in the Ifo part of the camp, other new arrivals have found space staying with families already living in older blocks. This has lead to an increase in density of the population in those areas.

Although there are still high levels of poverty and some degree of child malnutrition in the camp, in general the economy of the camp has developed and increased remarkably since 2007. There are visibly many more stalls in the main markets in the camp, and enterprises employing multiple workers, such as ice factories, have been established.

There are plans for another large-scale extension of the camp in 2010, intended to accommodate new arrivals.

Implementation

Since 2007, the implementing organisation has been able to increase its capacity to deliver 3500 shelters per year. It has also been able to establish depots in each of the sub-camps where it works. These depots include large spaces for the fabrication of concrete latrine slabs.

Families are still expected to produce mud blocks themselves (approximately 1700 blocks per shelter). This ensures a sweat equity component to the programme, and provides the labour resources necessary for a programme of such scale. However, this approach continues to result in unplanned excavation of mud within the camp, with the holes often becoming refuse pits, or mosquito-breeding sites in the rainy seasons.

The mud excavated for the se blocks forms only a part of the total mud excavated by the refugees in the camp, but the organisation is aware of the environmental impacts of their programming.

In 2009, the organisation reviewed all elements of the shelter programme in Dadaab. Th aim of this was to create a systematic and holistic approach to reducing the environmental impact of the shelter programme. The maximum amount of shelter support that it could provide per year was definitively agreed. Shelter programming was limited by the organisation's logistics and the volume of sustainable materials.

Selection of beneficiaries

Selection of beneficiaries is done according to agreed vulnerability criteria. Block leaders are asked to propose a list of the most vulnerable members of the people living in their block. This list is then cross-checked by the organisation.

Technical solutions

In place of the traditional 'tukul' ,tents, or the wattle-and-daub huts, the organisation provides refugee households with support to construct more durable shelters. These are made from mud blocks with roofing made from timber and corrugated iron.

The design uses larger pillars and widened foundations (made with mud blocks) to provide better resistance against flooding. The design is now being reviewed, so that for parts of the camp with a lower risk of flooding the foundation may be made smaller.

Recent pilot projects have been conducted to further reduce the environmental impacts of construction, by investigating alternative, recycled materials. These include poles made from recycled plastic for use in the construction of latrine cabins.

Logistics and materials

Before 2007 it was assumed that mud was an unlimited material. Further investigation of the geology of the area, as well as the land ownership patterns, have revealed that types of mud appropriate for block-making are in limited supply. For a certain proportion of the mud


Photo: Jake Zarins

needed each year, agreements can be made with the local community and local NGOs to excavate water-pans. The excavated mud is used to make the blocks.

For larger amounts of mud, transportation from further afield may be necessary. The organisation has also worked with the United Nations Environment Programme, the Forest Stewardship Council, the Kenya Forestry Service and the private sector to map the potential for identifying sustainable timber sources in Kenya.

In an arid climate, the provision of water for the making of the mud and for the fabrication of concrete slabs for the latrines continues to be a concern. The organisation is currently considering the feasibility of digging bore-holes which would be dedicated simply to the water supply needed for the shelter and latrine programme.

Materials list

Material	Quantity
2.5m long Corrugated Iron sheets	20 sheets
Plain steel sheet (door)	1sheet
2x2 timber - cypress	102m
Nails 3"	0.25Kg
Nails 4"	2.5Kg
Nails 2"	6 pieces
Nails 1"	.5kg
Roofing nails	2.5kg
Tower bolt	1
Padbolts	1
Galvenised iron ridges	4
Butt hinges	3pcs
Wood preservative	8l
Binding wire	1Kg


Photo: Jake Zarins

Shelters under construction in Dadaab. Much of the construction, including making mud blocks, is done by the women.
Photo: Jake Zarins

A.11 Kenya, Dadaab - 2007- Conflict and floods

Case study: Shelter construction

See Shelter Projects 2008 for more

Project type:
Construction of self build new shelters for refugees
Community mobilisation,
Disaster mitigation.

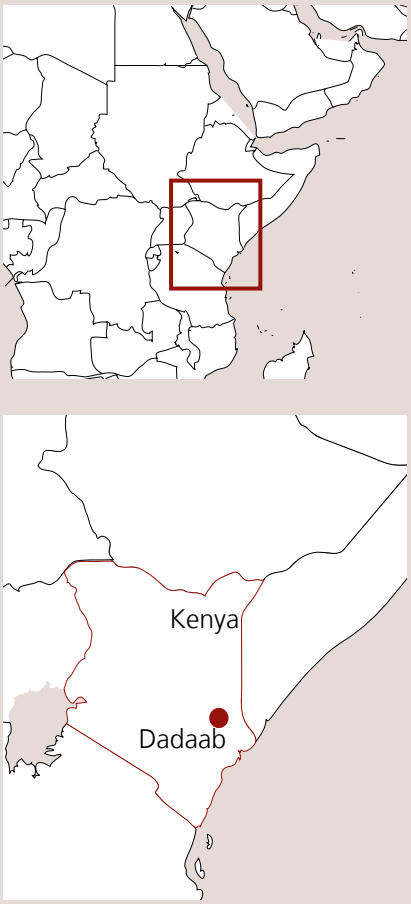
Disaster:
Ifo refugee camp flood response, Dadaab, Kenya 2007

Number of households displaced:
Approximately 6,000 households displaced within the camps, mostly from Ifo camp
(note the camps contain refugees mainly displaced from Somalia)

Project target population:
500 households in Ifo camp

Occupancy rate on handover:
100% based on visual assessment

Shelter size
18m^2 (6m x 3m)



Project timeline

- Dec 2007 – Project completed
- Jan 2007 – Project begins
- Nov 2006 – Floods affects nearly 100,000 people, road access to camps blocked
- Limited funds for small upgrading projects
- 1991 – Somali refugee camps open around Dadaab, Kenya

Summary
A combination of shelter upgrading and emergency response funding assisted 500 families were to make bricks and build shelters. The project was implemented through a community-based construction program following flooding in a large refugee camp.

Mud brick houses with a solid plinth to resist future flooding were constructed
Photo: Joana Cameira

A.12 Liberia - 2007- IDPs, refugees

Case study: Update - Self-build shelters

See Shelter Projects 2008 for more

Project type:
Community mobilisation
Self build
Materials distribution
Cash payment for materials and labour
Technical support for improved design

Emergency:
Liberian returnees, 2007.

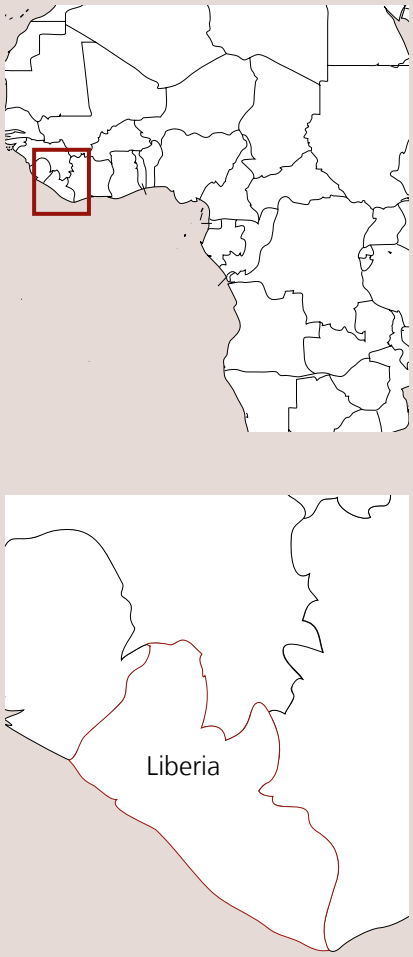
Houses damaged:
Estimated 80% of housing was damaged.

number of people displaced:
Approximately half of a million of Liberia's 3 million population was displaced by the civil war.

Project target population:
500 individual shelters in Cape Mount, Bomi and Gbarpolu counties, benefitting 1,328 beneficiaries. After completion, 1,782 people were living in the houses as family members or lodgers.

Occupancy rate on handover:
100%

Shelter size
25m² (5m by 5m)



Project timeline

- 6 months- – Project completed. – Verification of occupancy and final payment
- 5 months- – Final distribution of materials 2nd payment
- 2 months- – Part-distribution of materials – First payment
- 1 month- – Construction begins – Agreements signed with communities
- Aug 2007- – Project begins
- Jun 2007- – Official return date for refugees
- Mar 2006- – Official return date for IDPs
- Aug 2003- – Peace signed. UN Mission In Liberia begins.
- 1999- – After the 1989-96 conflict, civil war starts again

Summary
Shelter assistance for vulnerable returnees (IDP and refugees). Building materials were provided and cash incentives given to communities for construction. The agency provided technical support and close project monitoring in collaboration with the community.

Update

Liberia's reconstruction continues to be challenging, with on-going displacements of small numbers of people due to land-ownership conflicts. By the end of 2008, displaced people who had found shelter in public buildings remained unregistered and subsequently excluded from official assistance. Many people returned to the areas of their former area of displacement due to the lack of services available in return areas.

In this programme, shelter maintenance has been a problem post-completion – both in terms of beneficiaries' physical/financial ability to maintain shelters (45% are classified as having no external help) and the durability of materials used. However, the occupancy rate remains high – 95% of the shelters are occupied by the original families, and they continue to rate the project achievements highly.

In a project review, it was recommended that future similar projects should:

- include a follow-up monitoring budget
- consider use of more durable materials (such as a cement floor)
- provide basic furniture such as beds (as some people are sleeping on floors)

A.13 Rwanda - 2008 - Conflict returnees

Case study: Update - Distribution and information

See Shelter Projects 2008 for more

Project type:
Community mobilisation
Establishment of beneficiary associations
Technical guidance
Materials distribution

Emergency:
Forced repatriation of people of 'Rwandan origin' from Tanzania to Rwanda

number of people displaced:
Approximately 60,000 people considered to be illegal immigrants in Tanzania were required to return to Rwanda. 8,000 people had been forced to return by June 2007.

Project target population:
469 households

Occupancy rate on handover:
100%. Of the 220 shelters completed by August 2008, all were occupied

Shelter size
48 m2 (6x8m)

Project timeline

- 14 months – Second phase ends
- 12 months – Third phase begins
- 8 months – Second phase begins
- 6 months – First phase ends
- 1 month – 18,000 returnees.
- Nov 2006 – First phase begins
- July 2006 – Joint Rwandan and Tanzanian governmental team formed
- May 2006 – Returns begin.
- March 2006 – Declaration: all illegal residents of Rwandan origin to be expelled
- 1996 – 475,000 Rwandan refugees returned to Rwanda from Tanzania
- 1994 – Rwandan genocide. 500,000 Rwandans flee to Tanzania

Summary
This project provided support to people of Rwandan origin expelled from Tanzania by providing materials for house building, masons and providing shared services at the site of return. Communities were mobilised by forming beneficiary associations in consultation with the local government. The role of the implementing organisations was to collectivise the tasks required for house building.

Update

In 2009, 119 returnee families from Tanzania were still living in the Kiyanzi camp. A project had been initiated to build 110 houses, a permanent shelter solution for beneficiaries who had poor access to both water and health services in the camp.

The wider resettlement and reintegration program for 18,000 returness from Tanzania was described as a success by a UN source.

Completed shelters
Photo: Matthias Wohlfeil

A.14 Somalia - 2008 - Conflict

Overview

Summary

Since 1991, Somalia has remained without a central government and has been in a state of intense factional fighting and civil war. Chronic insecurity and periods of drought have led to massive displacement of populations. By 2009 there were more than 1.3 million internally displaced people in Somalia, with nearly 100,000 people newly displaced in the months of May and June 2009.

Funding constraints combined with security issues have lead to a very limited presence by international supporting organisations. This is in strong contrast to the high level of need.

Background

Somalia has been highly insecure for nearly 20 years. As a result there has are now an estimated 1.5 million internally displaced people in Somalia and a further 560,000 refugees, a large proportion of whom are living in Dadaab camp in Kenya.

Somalia is divided into three very different regions; Somaliland (the most secure), Puntland, and South Central Somalia (the least secure) which includes the capital Mogadishu. These regions have very different climates and levels of humanitarian access.

Somaliland

Many of the displaced people in Somaliland have settled in the capital Hargeisa. The main concentration of displaced people is in three unplanned settlements that were initially formed as temporary sites. Some people have moved to permanent relocation sites on the outskirts of the city. Many other people have settled on smaller patches of land across the city.

Puntland

In Puntland, humanitarian access is hindered by lawlessness. In the major port city of Bosaso, the climate is very hot and dry, with average annual rainfall under 100mm.

An exceptionally hot climate, strong winds, combined with overcrowding, poor sanitation and social tensions means that large groups shelters are frequently destroyed by fire.

South Central Somalia and Mogadishu

In South Central Somalia, extreme security issues have severely limited humanitarian access. As a result many of the programmes by international organisations are managed remotely from Nairobi, and time spent working with affected populations is severely limited.

Shelter programmes

Across Somalia, very different shelter programmes have been implemented. They include:

- Emergency distributions of household shelter items, tents and plastic sheet to newly displaced families.
- Transitional shelter construction for the more vulnerable families living in congested sites.
- Distribution of tents for people living in planned sites.
- Distribution of shelter repair materials for some of the more vulnerable long-term displaced families.
- Addition of fire breaks, site clean-up and improvements to sanitation for some of the more congested urban sites.
- Construction of durable houses from masonry block in planned settlements on the outskirts of Hargeisa (Somaliland) that have a long lifetime.
- Provision of sites with accompanying services that are allocated to families with accompanying entitlement to lands.

The scale of these programmes has ranged from large scale emergency distributions of plastic sheeting for hundreds of thousands of families to the construction of permanent housing that is much more limited in scale (hundreds of families).

In urban settlements in Bosaso and Hargeisa, the critical shelter issues have been outbreaks of fire and issues to do with overcrowding. Resulting shelter interventions have been more than simply the materials distribution or the construction of shelters. To meet the shelter needs it has been necessary to address issues with site layouts, create firebreaks, and improve sanitation.

Given the security context, and the nature of large scale displacements, tents have been required for some locations in Somalia. The quality of the tents has been variable, requiring organisations to develop precise specifications and relationships with suppliers.

Self-built shelters in Somalia, based on the traditional 'Buul'. In cities, they are built using recycled fabric, cardboard and tin cans.
Photos: Joseph Ashmore

A.15 Somalia, Puntland - 2009 - Conflict

Case study: Urban shelter upgrade

Full case study

Disaster:
Somalia conflict.
Displacement sites in Bosasso and Galkayo.

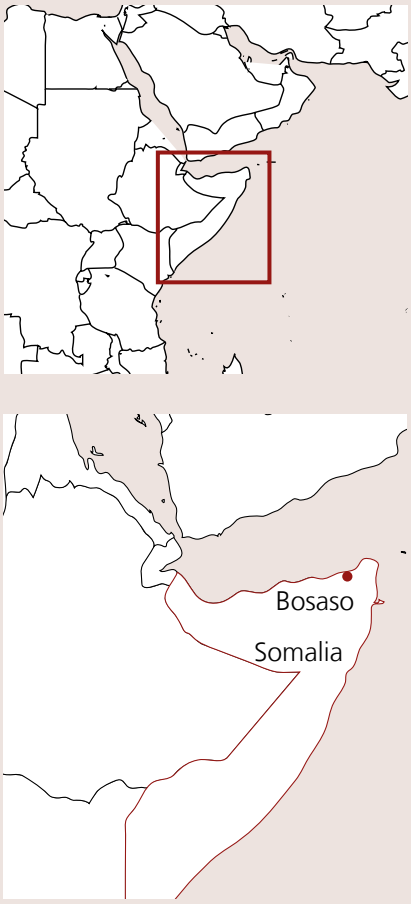
Disaster date:
Somalia conflict 1991 onwards.
Project implementation 2008 onwards

Population:
300,000 people (Bosaso)
200,000 people (Galkayo)

Project target population:
4000 households (24,000 persons), including; 1,450 tents, 1000 shelter kits in IDP settlements (4 in Galkayo and 2 in Bosaso).
500 fire guard steel drums distributed in Bosaso

Occupancy rate on handover:
100%

Project cost per shelter:
350 USD per tent
30 USD per shelter kit (wooden poles and ropes)



Project timeline

Summary
To meet the shelter needs of displaced people living in urban temporary settlements in the cities of Galkayo and Bosasso in Somalia, multiple approaches to shelter were used. To reduce risk of fire, fire breaks were made, sites were cleaned up, safe cooking areas were established and stoves were distributed. To meet shelter needs tents were designed and distributed. Additional support was provided in sanitation, hygiene promotion, and the construction of latrines.

Strengths and weaknesses

✓ Flexible approaches to shelter were adopted to meet local needs.
✓ Installing fire-breaks or re-planning sites, supporting communities to clear refuse in urban settlements, and providing oil drums for cooking in urban settlements proved to be the most effective way securing shelters against fire.
✓ Programmes were closely coordinated with other organisations operating in the cities.
✓ Shelter programmes were closely integrated with site layout and water and sanitation programmes.
× Long term maintenance and support is required to ensure that fire breaks remain and sites remain clear of flammable debris.
× Solutions and activities in displacement sites remain temporary fixes.
× Sanitation remained a significant concern after the programmes.
- Limited funding availability and challenging security made project implementation challenging.

A congested site in Bosaso
Photo: Øyvind Nordlie

Aftermath of a shelter Fire in Bosaso
Photo: Jama Yasin Ibrahim

Puntland context

The major populations of displaced people in the Puntland region of Somalia are centred in dense urban settlements in the city of Galkaiyo and in the port city of Bosaso. Outside these settlements, many people have also settled in the compounds or on the land of host families dispersed across the city. The number of displaced people had been increasing over previous years and the capacity of agencies to provide adequate social services is stretched. Humanitarian access is hindered by insecurity.

In Bosaso, the climate is exceptionally hot and dry (with annual rainfall under 100mm), and there are strong winds. Galkaiyo is less windy but still hot and dry. Climate combined with overcrowding, poor sanitation and social tensions means that large groups of shelters were frequently destroyed by fire.

Most of the settlements were controlled by gatekeepers who insist that the assistance is first provided to them, promising that they will then undertake the activities themselves. There were also issues with people taking control of assets once services were provided.

There was a lack of garbage disposal systems. Vector controls, dustbins, garbage collection points and landfills are almost nonexistent in Bosaso and Galkaiyo.

Technical solutions

Tents, plastic sheeting and traditional shelters are not fireproof; there were insufficient funds to build more solid shelters on a large scale, so multiple activities were required to reduce fire risk. These activities included:

- clearing sites of flammable refuse,
- establishing fire breaks within sites, and improving planning,
- removing the most flammable of shelters and replacing them with tents,
- establishing fire points,
- distributing stoves and cooking shields to reduce the risk of fire spreading,
- when shelters had been burned, emergency shelter kits containing sticks, ropes and plastic sheeting were distributed in emergencies

A stock of shelter kits was built as an immediately available responce to fire outbreaks and other emergencies in Bosaso and Galkaiyo. Stocks were released after a joint assessment by organisatons working on shelter programmes.

Settlement Selection

Criteria for selecting which community to work in were:

- settlements that had received no assistance before the project,
- in Galkaiyo, items were distributed to newly displaced families receiving shelter.

Sanitation activities focussed on:

- settlements with little or no sanitation facilities,
- settlements where protection violations had taken place due to lack of sanitation facilities,
- settlements where land was available for the construction of latrines at a safe distance from water sources,
- settlements where the community was willing to participate in the construction and maintenance of latrines.

Water scarcity in the settlements posed a challenge for improving hygiene in the targeted communities. Through the shelter cluster, the organisation advocated though

the WASH Cluster in Nairobi for the provision of water for IDP settlements in Galkaiyo.

Consulting and involving IDP committees from the onset was prioritized to improve participation. Although this resulted in delays, experience and understanding were gained that sped up the implementation as a whole.

Protection concerns were included in all of the stages of planning and the implementation of the project. 93% of beneficiaries were female-headed households. In total, of the 830 people who benefited from training, 41% were female.

Selection of beneficiaries

Host communities living within the IDP settlements in the same living conditions were included in the programme. Vested interests from the local and federal authorities proved to be challenging as a result of the huge need of the population compared to available resources.

Both displaced people and host family members were included in the projects. The project targeted:

- disadvantaged anf marginalised displaced people
- newly arrived displaced people (from 2006 and beyond),
- people who had been displaced many times within the temporary settlements,
- families whose homes are badly or totally destroyed,
- vulnerable members of the local host community living in the periphery of the IDP settlements.

Implementation

Seven shelter staff were engaged to implement the project and to provide technical support to local partners.

There were regular meetings with agencies in Puntland to discuss interventions and jointly share information. Lists of targeted beneficiaries and locations were discussed to ensure that duplication was avoided and the maximum number of people were reached.

Local partners were funded to erect tents and construct latrines.

Logistics and materials

The organisation directly procured community cleaning kits and distributed them during cleaning and hygiene promotion campaigns.

Kits of household items and tents were procured through internationally advertised tenders, as there were limited stocks available in local and regional markets.

A combination of very poor quality materials and strong winds meant that previous tents had very short lifetime. For this reason a frame tent was carefully developed with suppliers. During the process of this tent development, two batches of samples were requested, and the final model was signed of during a final visit to the manufacturers in China. The final detailed specification was subsequently shared with other organisations.

Delays in procurement and delivery of the tents was a major challenge.

During the programme, a conflict broke out between the two administrations in Galkaiyo in December resulting in suspension of activities.

All materials for the erection of the latrines (cement, timber and iron sheets for the walling and roofing, used oil drums, paints and plastic pipes) were procured locally in Bosaso and Galkaiyo by the local cooperating partners. They were instructed to use procurement procedures, approved by the international organisation that was funding the project.

Shelter kit - Galkaiyo

Kit for reinforcing existing shelters:

Material	Quantity
Plastic sheeting 4m x 5m	1
Timber poles (different sizes)	10
Rope	50m

Shelter kit - Bosaso

For famlies whose shelters have recently been destroyed by fire.

Material	Quantity
Wooden poles	32 (3- 3.5m long each)
Rope	100m
Plastic sheet (5m x 4m)	2
Sleeping mat	1
Household items kit	1

Community cleaning kit

Each kit for 10 households, 175 distributed in total.

Materials	Quantity
Rake	1
Wheelbarrow	1
Spade	1
Garbage disposal drums	1
Bill boards for public information	as required

Left: Shelter materials distribution. Right: cleaning up a shelter site
Photos: Jama Yasin Ibrahim

A.16 Somalia, Somaliland - 2009 - Conflict / drought

Case study: Urban shelter upgrade

Full case study

Disaster:
Somalia conflict.
Displacement sites in Hargeisa.

Disaster date:
1991 onwards.
Project implementation 2008

Number of people displaced:
Over 60,000 people in Hargeisa in settlement sites.
Total population of Hargeisa estimated at 600,000

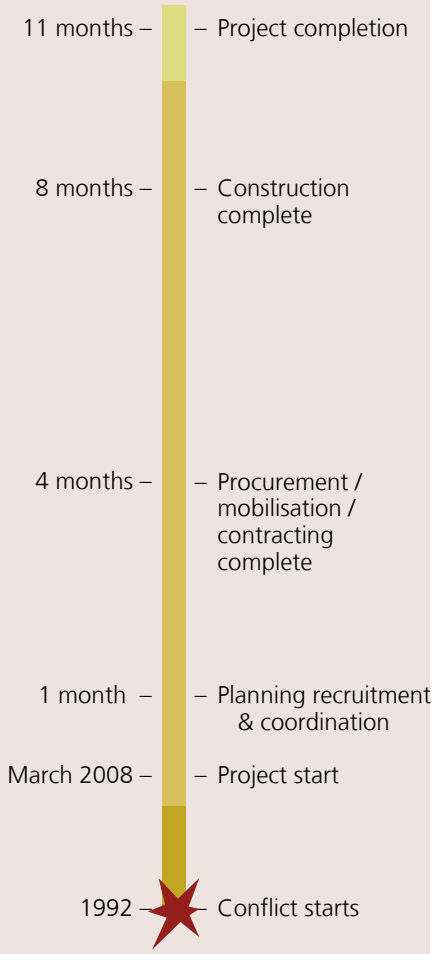
Project target population:
634 shelters constructed in two temporary settlements.

Occupancy rate on handover:
Very high. Many families were also seen to improve their shelters.

Shelter size:
16m²

Materials Cost per shelter:
620 USD per shelter

Project timeline



Summary
In dense urban settlements in Hargeisa, 634 transitional shelters were constructed in two temporary settlements. The project was implemented by two local partner NGOs. The construction was accompanied by improving site planning with access roads and by sanitation activites, implmented by other organisations.

Strengths and weaknesses

✓ Provision of appropriate shelters and materials that allowed upgrade. Many families were seen to make improvements to their shelters.
✓ Accompanied by programmes to clear access roads and improved sanitation
× The project was limited in scale due to funding limitations.
× Delays in materials supply.
× Shelters had some structural weaknesses and were in need of improvement.
- There was no follow on funding for 2009, as transitional shelter construciton was not seen as part of the donor's 2009 emergency priorities.
- Shelters were made so that the materials could be re-used or relocated, allowing them to be built on temporary sites.
- This programme focussed on those living in dense urban temporary settlements rather than those living with host families, who remain an unknown number. It is not clear if in so doing, it created a pull factor, attacrcting people to these sites.
- Community mobilization to enhance ownership, and information sharing and networking with all stakeholders was key to the programme
- Selecting the most vulnerable was challenging as all IDPs claimed to be vulnerable. Being able to cover the entire settlements would have reduced some of the pressure on selection.

Left: Timber frame and corrugated iron shelters built during this project
Right: Self built shelters next to improved access road
Photos: Joseph Ashmore

Somalia context

Hargeisa is the capital of Somaliland, relatively the most stable of the regions of Somalia. Hargeisa has a population of over 600,000 people and a displaced population estimated at over 60,000 people living in sites dispersed across the city. These people had been displaced by a combination of conflict and drought over the previous 18 years. The main concentration of displaced people is in three settlements that were initially formed as temporary measures.

There is a widespread wish by authorities and land owners that temporary settlements do not become permanent. Each settlement has different pressures regarding how long it will be able to remain.

There have been limited relocation programmes, and more are planned for the future, giving families permanent entitlement to land on new sites on the outskirts of Hargeisa. Previous programmes have included the construction of durable housing, and this has led to individual family members remaining in the camps to continue to claim the benefits of camp residency.

Most of Somalia has significant issues with deforestation. However timber, either sawn, or in poles, is the key structural element for the shelters. If sourced locally there was a risk of increasing local environmental damage, whilst if imported from uncertain (non-certified) sources, there was a risk that the environmental impact would merely be spread to other unknown locations.

Programme overview

This programme:

- developed a profile of the displaced people through a large scale survey.
- distributed shelter materials kits (wooden poles, ropes, canvases etc) to 280 families to improve their shelters
- constructed timber and corrugated iron shelters for 634 families. For the two targeted IDP settlements
- established firebreaks and improved sanitation in the project site.

Beneficiary selection:

Following an inital registration exercise, some of the selected households were found to be the same or similar. This created suspicion that the committees selected a number of households from the same family. Further verification had to be undertaken on families falling into this category.

Beneficiary selection criteria were developed in consultation with the shelter cluster, IDP settlement committees, line ministries and local municipality. They were households

- with many children and one or more people with disabilities, where the head of the family cannot take proper care or usually unemployed.
- headed by a woman with many children and no income.
- with children and elderly parents, insufficient shelter, unable to work and without space to build additional shelter.
- with many children and headed by either a brother or a sister who can not support the family.
- who were in need of urgent improvement of shelter, and who were hosting other families displaced from South Central Somalia.

Settlement Selection:

In coordination with the Somaliland IDP Working Group, line ministries and local municipalities it was agreed to support the two temporary settlements with highest and the most congested population in Hargeisa.

Daami area had been considered one of the poorest quarters in Hargeisa as long ago as 1988. Most of the current residents had settled during the early mid-1990s.

The settlement contained people from Southern Somalia displaced by conflict after 1997, Ethiopian refugees & immigrants, minority clans from within Somaliland and other minority groups.

Stadium settlement contained over 17,000 people, and lacked any infrastructure or social services.

Technical solutions

The project aimed to improve the living conditions of displaced families in Hargeisa through provision of temporary shelter and shelter kits with a key focus of

enhancing protection of the IDPs. This was based on the strategy agreed upon by the organsiations working on sheltering issues and the local authorities.

The shelters that were constructed had a timber frame made from imported timber, and a corrugated iron roof and walls. The shelters were based on shelters observed across Hargeisa, that had been built by low income families.

Surprisingly, the structures were not excessively hot in comparison to the previous self-built shelters (Tukuls / buuls) in the camp. Dust was a greater concern to occupants than the temperature. Common upgrades made by families include

- plastic sheet for ceilings
- plastic sheeting, fabric and cardboard for walls
- plastic sheet or lino for flooring.

In some cases families have upgraded shelters by building enclosed extensions and improved flooring.

The shelters used simple post foundations so they can be easily dismantled and removed at any time, with all components easy to transport in case of relocation.

Whether, or when, most sites will actually close is not entirely clear. In the absence of viable alternatives for those living in temporary settlements, there was no immediate prospect of closure for the majority of sites.

Occupancy of constructed shelters was very high, and most families appeared to have upgraded them. They have also blocked gaps to prevent wind from infiltrating. However, although the shelters appear to be well appreciated, families may have prioritised other needs such as food and clothes higher than these shelters.

Given the very low household incomes in Somaliland, Puntland and South Central Somalia, even shelter kits (less than 200 USD), are equivalent to a significant amount of disposable income for displaced families. More involved shelter interventions such as durable houses (4000 – 5500USD) constitute a handover of physical capital that may be equivalent to over ten years of disposable income for the families that receive them.

Shelter quality

Although the occupants expect the shelters, with maintenance, to last for more than 10 years, there were several quality issues with these shelters:

- Roofing timbers are thin. What were initially supposed to be 50mm thick timbers are closer to 35mm thick – leaving very slender structural members (a result of cutting 130mm timbers into three rather than two pieces).
- Roofing timbers were not very well tied down to the walls.
- Sump oil / diesel mix was not universally available during construction. Providing it would have reduced risk of termites.
- Timbers that run around the base of the structure for fixing the corrugated iron sheet should have been raised so that they are at least 100mm clear of the ground to reduce risk of termite infestation.

Implementation

The construction work was divided among two local NGOs. The implementing international organisation providied technical support and monitored the work.

Timber frame structure

Below is the materials list for the timber frames structures that were built in Hargeisa.

Item	Quantity
Hardwood (50mm x 75mm x 6000mm) for vertical	6.00
Hardwood (50mm x 50mm x 6000mm) for horizontal	18.00
Galvanized Iron sheet 30 guage.	36.00
Concrete works	
Slab on Fill (fc' - 2500psi concrete strength)	1.00
800mm x 2100mm flush door	1.00
600mm x 600mm wooden window	2.00
Machine shop	1.00
Nails assorted	1.00
Labour, consumables and tools	

Shelter improvement kit

Below is a shelter kit that was distributed to 280 families in Hargeisa.

item	Quantity
Canvas sheet (6mx4m)	1
Plastic sheet (6mx4m)	1
Timber poles	25
Metal sheets made from recycle tins – locally procured.	3
Metal door (from old oil barrel)	1
Rope	12m
Nails	1Kg

Building a shelter in Hargeisa .
Photo: David Womble

Shelters were upgraded by families
Photo: Joseph Ashmore

A.17 Somalia - 2007 - Conflict

Case study: Urban Resettlement

See Shelter Projects 2008 for more

Project type:
Resettlement project
Support to local authorities
Security of tenure
Provision of shelter
Service provision to family plots

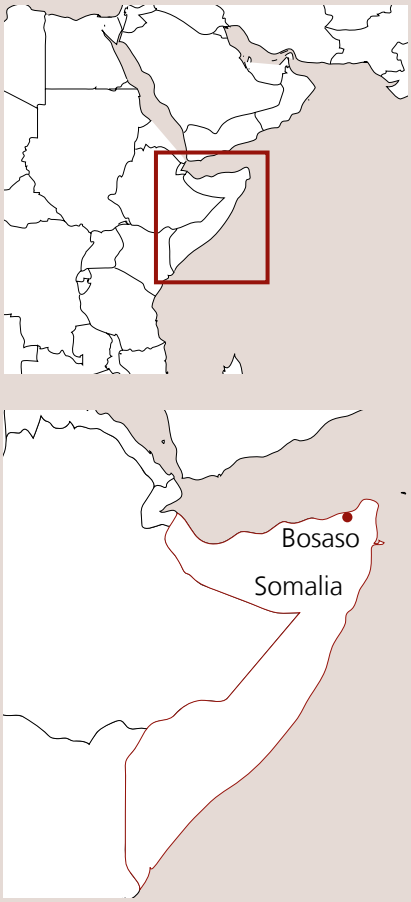
Emergency:
Somalia civil conflict – 1991 onwards (chronic emergency)

Number of people displaced:
400,000 in Somalia before 2007. 1,000,000 in 2008
25,000 IDPs estimated to be in Bossaso

Project target population:
140 families; 80% IDPs and 20% urban poor.

Occupancy rate on handover:
100% of resettled IDPs (112 families).
25% of urban poor (7 of 28 families).

Shelter size
13.5m² on a 7.5m x 15m plot (including shower and toilet), shelter extendable by beneficiaries



Project timeline

- Dec 2007 – Construction completed
- Sept 2007 – Finalisation of family selection
- 2007 – Beginning of family selection
- Dec 2005 – Implementation plan agreed
- Sept 2005 – Initial agreement on strategy for Bosaso
- June 2005 – Shelter cluster shares assessment report on IDPs
- Dec 2004 – First assessment of proposed relocation site in Bosaso
- 1998 – Puntland declares autonomy
- 1991 – Conflict starts

Summary
A resettlement project in Puntland, Somalia, preceded by detailed discussions on the concepts of access to land for IDPs and related negotiations on land rights. A consortium of agencies built a serviced community settlement supporting beneficiaries in the construction of extendable single-room houses and providing them with temporary shelters on their new plot.

"Sites and services". The project focused on negotiating land and providing access, secure compound walls, water supply and sanitation for it.
Photos: Ombretta Tempra

A.18 Sri Lanka - 2007 - Conflict returns

Case study: Update - Core shelter

See Shelter Projects 2008 for more

Project type:
Transitional shelter construction

Disaster:
Civil Conflict in Sri Lanka

Number of people displaced
520,000 families were displaced by the conflict in Sri Lanka by the end of 2006. 238 houses were destroyed in Karukamunai the community where the NGO was working.

Project target population:
In 2006, over 300,000 people were displaced. This project targeted 213 of these families. The project design and methodology was taken on by other NGO's providing shelter in the areas of return. In total over 1100 of the shelters were built.

Occupancy rate on handover:
100%, with 83.5% of families making adaptations to their shelter after moving in.

Shelter size
18.6 m^2 (200 ft^2) - or 27.5m^2 (300ft^2)in later models

Project timeline

Summary:
This project built core shelters for families returning to their villages after being displaced by conflict. The construction was owner-driven, allowing families to later expand the shelter as their circumstances allowed, for the same initial costs as less durable 'semi-permanent' shelters. Expansion and adaptation of the shelters happened very early on amongst the majority of beneficiary households.
The project was later copied by other organisations working in areas of return and over 1000 of the shelters were built.

Left: completed shelter. Right: shelter with upgrade by family
More than 80% of the families used personal resources or their own time and effort to upgrade their core shelters.
Photos: Jake Zarins

Above - the revised core shelter designs were also upgraded by their new owners.
Photos: Varatharajah Ramesh and Glenn Costes

Update: background

Between 2006 and 2009 many thousands of families were displaced in both East and Northern Sri Lanka by a renewed and ultimately final conflict between the Government of Sri Lanka and the LTTE, also known as the Tamil Tigers. Fighting was initially focused in the eastern districts of Trincomalee and Batticaloa. Once these previously rebel held areas had been liberated, displaced families were allowed to return by the government.

This project initially focused on the construction of 213 'core shelters' in a returnee area employing an owner driven approach which promoted high levels of participation and adaptation by beneficiaries in the construction of a more permanent shelter solution at a similar unit cost to the transitional shelters built in the area following the tsunami.

Update: project approach

The approach used by the NGO during this project was considered a great success and quickly received the backing of both local authorities and beneficiary communities due to the more permanent nature of the Shelters provided and the income generation opportunities promoted in the methodology. Following feedback from families living in the shelter, the design was adapted during later phases of the project and it was found that through alterations in layout and material usage it was possible to provide a fully masonry enclosed 200ft2 area for the same cost as the original design. Orientation of the roof pitch was also altered in the design to facilitate future expansion of the building to suit the needs and economic circumstances of the family.

Update: adoption of core shelter approach

The 'core shelter' design and methodology was taken on by other NGO's providing shelter in the areas of return. In total over 1100 of the shelters were constructed across Trincomalee district by five different organisations. The design has further evolved to meet the demands of the government in regard to the resettlement in the North of the Sri Lanka. These were to provide 300ft^2 (27.5m^2) of covered space whilst retaining the possibilities of future expansion by the beneficiary families. Over 90 of these 300ft^2 (27.5m^2) models were built during 2009 in the northern districts of Sri Lanka along with nearly 300 of the original 200ft^2 (18m^2) design.

Different designs of core shelter were offered to families
Photo: Varatharajah Ramesh

A.19 Sudan, Darfur - 2004 (ongoing) - Conflict

Case study: Update - Material distribution

See Shelter Projects 2008 for more

Project type:
Darfur shelter materials pipeline,
Multi-agency common logistics system,
Distribution of shelter materials and non-food items.

Emergency:
Displacement due to conflict in Darfur, Sudan, 2004 (ongoing).

Number of people displaced:
May 2004: over one million people in Darfur had been affected and around 700,000 were internally displaced.

Project target population:
The initial target was 1,000,000 people (167,000 families), increased to 1.4m people in September 2004.

Occupancy rate on handover:
80% of target population reached by December 2004. Further 8% of beneficiaries reached by other organisations.

Shelter size
One 4mx5m plastic sheet was provided per family

Project timeline

- 8 months – 80% of beneficiaries reached
- 5 months – Target increased to 1,400,000 people
- 4 months – 70% of beneficiaries reached
- 1 month – Project is included in the interagency funding request
- First distribution
- Apr 2004 – Concept paper is approved
- Dec 2003 – Darfur ceasefire breaks down completely
- Sept 2003 – Ceasefire between SLA and Sudanese government holds for short time
- April 2003 – Refugees begin arriving in Chad to escape Darfur

Summary
A joint distribution mechanism, which would later include joint procurement, was set up by a consortium of NGOs and UN agencies to standardise procurement and distribution of basic shelter materials to those displaced in Darfur by conflict.

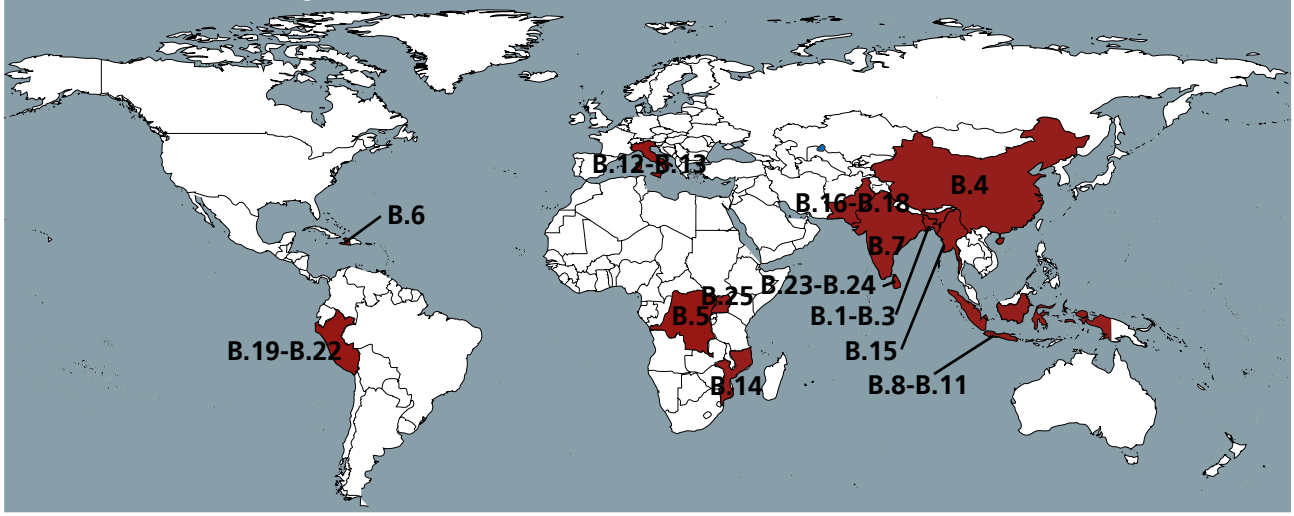
Update

In 2008 the NFI Common Pipeline was the source for around 90% of all distributions of NFIs and shelter materials. The pipeline served over a million people in the Darfur region. Distributions are ongoing both due to newly displaced populations and the need to replenish used or worn-out items to previous recipients. A monitoring report from 2008 showed plastic sheeting to be the most valuable commodity. Affected families expressed their concerns about the quality of some of the plastic sheeting and the quantity (one sheet is distributed per household). A survey showed that just 4% of non food items and 20% of plastic sheets distributed more than a year previously were still used by the recipients.

Queue for material distribution.
Photo: Joseph Ashmore

SECTION B

Natural disasters



B.1 Bangladesh - 2009 - Cyclone Aila

Overview

Summary

Cyclone Aila struck the south west of Bangladesh and neighbouring districts of India. The storm displaced around 2 million people, most of whom returned to their places of origin and started spontaneous or assisted recovery within a week.

Critically, Aila destroyed more than 700 km of coastal embankments. After five months, over 200,000 people were still living in very basic temporary shelters, unable to return because their homesteads were still under water.

One year later, repair of the embankments was far from complete. As a result of lack of land and funds, there were far fewer reconstruction support programmes than there had been for Cyclone Sidr, and thousands of families remained more vulnerable to future flooding.

Context

The south west of Bangladesh is characterised by low-lying lands protected by embankments surrounded by water. The region is known for the Sunderban national park, the largest mangrove forest in the world, but is also home to families primarily making a living from agriculture, forestry, fishing and shrimp farming.

There are six seasons in Bangladesh - Grismo (summer), Barsha (rainy), Sharat (autumn), Hemanto (cool), Sheet (winter) and Bashonto (spring). In winter, temperatures can fall to 7^{0}C. The main cyclone season starts in March, and is accompanied by higher winds and higher precipitation.

The disaster

Cyclone Aila hit the south western part of Bangladesh (Khulna Division) and West Bengal in India on 25th May 2009. 190 people were killed by the flooding.

The seawater flooded villages and fields displacing over 2 million people, many of whom were still living in poor conditions on strips of raised land one year later. 100,000 livestock were killed and over 340,660 acres of cropland destroyed. Thousands of kilometres of road were damaged or totally destroyed and hundreds of kilometres of flood protection embankments were washed away

The response

The key challenge facing families was the destruction of the embankments. Until the embankments were repaired, they would remain displaced, durable housing could not be built and livelihoods could not be restored.

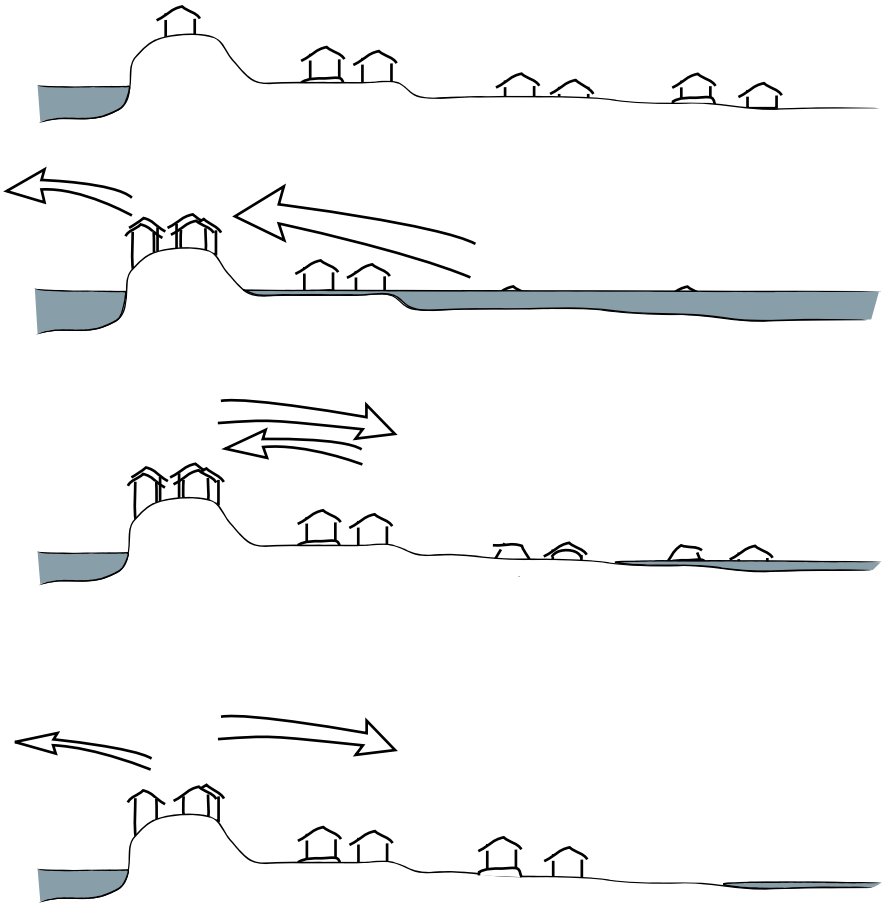
Although some embankments were repaired by communities themselves or through cash for work programmes, many of the damaged sections required heavy machinery to repair. The scale of these engineering works required intervention by the government.

The first phase shelter response was distribution of plastic sheeting and household items. After three months it was clear that the response had been underfunded; some further distributions of plastic sheeting and blankets began as winter approached.

Despite the poor quality of shelter, many families identified that their key needs were for embankments to be repaired and for food, water and livelihoods. However, in the absence of land and funds, projects were limited.

After 5 months, 200,000 people remained displaced.

Embankments were not rapidly repaired, and land remained flooded. Families remained displaced on embankments
Photo Joseph Ashmore



Before the cyclone, people lived on land protected by embankments. Some landless people lived on embankments and beside roads

Immediately after the cyclone many people moved to the roads and the embankments because their land was flooded.

Six months after the cyclone, many embankments remained broken and land was still flooded. There was limited return, and 200,000 people still lived on the roads and embankments. some returned to their land by night and returned to the embankments at night or during high tides.

Until all of the embankments are repaired, return will be limited. For those whose livelihoods remain badly affected, there will be no other option but to migrate to other areas and the big cities, increasing urbanisation.

Illustrations: Joseph Ashmore

"Many thousands of people displaced by the Aila cyclone, who have now been living in makeshift shelters for the last ten months, are at risk. If the embankments aren't repaired urgently, the humanitarian consequences will be catastrophic. Many families have already been displaced several times since Aila struck and have lost their homes and their livelihoods."

Ambassador Dr Stefan Frowein, the Head of the European Union's Delegation to Bangladesh

Temporary settlements on roads (left top) and embankments (left bottom, right) Photos: Joseph Ashmore

B.2 Bangladesh - 2007 - Cyclone Sidr

Overview

Summary

Cyclone Sidr hit the south-western coast of Bangladesh during the evening of November 15th 2007. Cyclone Sidr destroyed over 450,000 houses across 30 districts, through wind damage, flooding and tidal surge. More than 50 percent of households in all of the six worst affected districts were either damaged or destroyed.

Most families built some form of shelter after four weeks with the notable exception of the most vulnerable members of the community. Families living outside the cyclone barriers had the greatest diffculties.

More than 160 local and international organisations were involved in the shelter response. Programmes included distribution of basic shelter items, shelter construction and training in safer construction.

Background

Bangladesh is one of the world's poorest and most densely populated countries. Poverty often compels families to settle in areas that are particularly disaster prone, such as coastal areas and lands newly emerged from riverbeds.

Most of the delta of South Bangladesh is cultivated wetlands. Many rivers cross the area, changing constantly and creating land insecurity. Some of the population lives in improvised or moveable shelters, mostly on land provided by the government on informally occupied land.

Since independence in 1971, the country had endured almost 200 disaster events – cyclones, storm surges, floods, tornadoes, earthquakes, droughts and other calamities – causing more than 500,000 deaths and leaving a serious impact on quality of life, livelihoods and the economy.

For simple structures, owners of the house are usually capable of doing the construction work themselves. Heavy manual labour or other assistance is required, they will solicit the help of a daily labourers, called 'krishan'. If woodwork is involved, they will hire professional carpenters.

Coping mechanisms

Four weeks after Cyclone Sidr passed, most affected people had found themselves some kind of temporary shelter.

People, whose houses were completely destroyed, built temporary shelter using scrap material that they could find. The living conditions were poor and did not provide enough shelter against rain or cold. Other people found refuge in relatives' houses.

For those, whose house was damaged, they repaired their house as much as possible, re-using the materials of their previous house. In some cases they used some new materials. The stability and general living quality of these houses was generally lower than it had been before the cyclone.

In all cases people were more vulnerable for future winds, floods or tidal surges than they had been before the cyclone. Many houses needed to be replaced urgently, or upgraded before the start of the next cyclone season.

Many affected families had expressed a clear will to continue on the land where they were previously living, even if the land was at a risk of disappearing.

The response

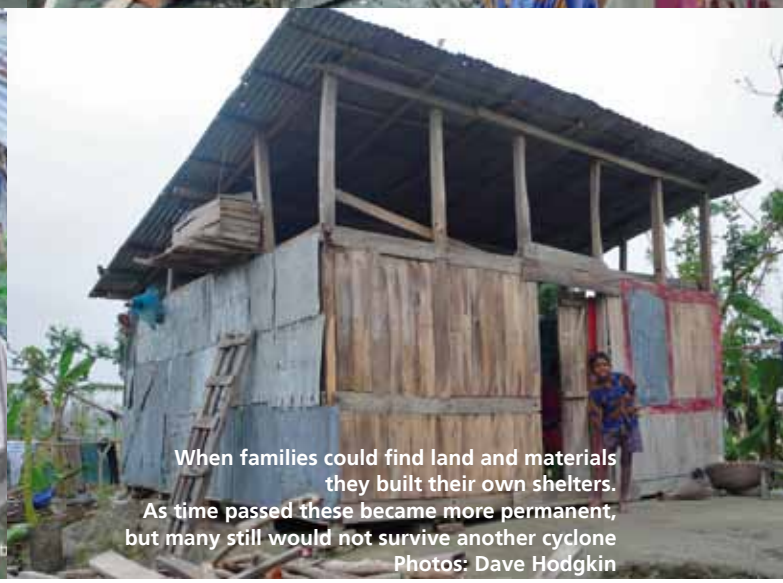
In the response, several approaches were made to support families to find shelter:

- general distribution of blankets and household items
- distribution of emergency shelter covering items such as tarpaulins, and tents
- shelter assistance packages including corrugated iron and tool kits
- transitional shelter programs. to construct shelters or core houses.
- Shelter training programs to improve construction quality and awareness of hazards to housing.

There were also multiple programmes distributing cash and some organisations advocating for improved access to safe land for the most vulnerable families.

Emergency shelter built by a cyclone affected family
Photo: Dave Hodgkin

Families rapidly built emergency shelters, using materials that they could recover, that they could buy or that they received. With time many were able to improve their shelters, but the underlying vulnerability to flooding and cyclones remained
Photos: Dave Hodgkin



When families could find land and materials they built their own shelters.
As time passed these became more permanent, but many still would not survive another cyclone
Photos: Dave Hodgkin

B.3 Bangladesh - 2007 - Cyclone Sidr

Case study: Core shelter, repair and awareness

Full case study

Country:
Bangladesh

Disaster:
Cyclone Sidr

Disaster date:
November 15 2007

Number of houses damaged:
458,429 completely destroyed.
Thousands more damaged.

Project target population:
1,250 core shelter units.
5000 households supported with safe shelter awareness / repair.

Occupancy rate on handover:
High.

Shelter size:
15m²

Materials Cost per shelter:
Core shelters- 1600USD.
Including direct costs.
Training - 1 USD per family
Toolkit - 30 USD
Cash grant - 75USD per family

Project timeline

Summary
To meet the housing needs of 1250 cyclone affected families, a programme working in many sectors of support was conducted. Families were identified through a detailed but slow transparent validation process. Families received a house, toolkits, cash and training.

Strengths and Weaknesses

✓ Several approaches were used in the same programme.
✓ Core shelter construction project was outsourced to consultants and contractors to respond to the scale of operation, time constraints, staffing and construction quality
✓ Use of consultants for monitoring reduced the need to recruit more project staff.
✓ Methodologies developed in this programme were documented so that they could be used elsewhere.
✓ Assessments required several visits to affected houses. This made for accurate selection of families but it delayed the actual delivery of support.
✓ A cash grant program was developed, including several steps and procedures to ensure transparency and security.
× Each household was visited by several assessment teams for general survey and other sectoral technical verification (shelter, watsan, livelihood) that sometimes created confusion and gave the wrong impression to beneficiaries.
× It would have been better to include a shelter specialist in the general survey to reduce the lengthy response time.
× The cash grant distribution process was delayed due to the slow functioning of the government banking system
× Though the beneficiary selection process was intensive and accurate it took much more time than expected.
× The project provided reduced support for families for whom land could not be found.
- The amount of shelter support provided was limited by funding, targeting of communities inside 12 clusters, human resources and operational timeframes.
- Successful implementation of large scale construction projects requires good team work from bottom to the upper lever of management.
- As procurement is the key to the success of the shelter project, good collaboration between the field offices and the country level-procurement department is required.

The core shelters were built by contractors and selection of families was through a lengthy transparent process
Left shows the frame of the structure
Photos: Xavier Génot, IFRC

The disaster

Cyclone Sidr hit the south-western coast of Bangladesh during the evening of November 15th 2007. See page 43 for more on the overall response and context.

Programme overview

The shelter programme had five components. These were:

- Core shelter construction
- Training on safe shelter awareness and repair
- Distribution of a toolkit
- Distributions of cash grants
- Technical advice and support for shelter repair.

The approach adopted was to use contractors to build core shelters for the 1250 most vulnerable families. These families were additionally supported through training, cash grants and a toolkit to build core shelter extensions.

Selection of beneficiaries

The organisation visited around 70 villages in 4 districts. Following this, 33 communities were selected. Approximately 11,000 households were assessed by door-to-door visits to identify needs, and 5,000 households were identified as being in need of shelter support

A second door-to-door assessment then categorized the damage according to seven categories:

- Categories 1,2: non repairable
- Categories 3,4: severe damage
- Categories 5,6: light damage
- Category 7: no damage

1,250 families were identified as having houses that were destroyed or non-repairable. Where too many beneficiaries were eligible for core shelter, a social ranking (family and economic vulnerabilities) was used to prioritize families.

When families were landless, or if their land was in an unsafe location, the teams with the community committee representatives tried to support them to acquire new land. When land could not be identified, families did not receive shelters but did receive the toolkits, cash and the training components of the programme.

After technical verification and social ranking processes, lists were finalised. Lists were validated by community committees and then approved by a regional committee. The list was then publicly posted, and time was given for complaints.

Core shelter

The design of the core shelter was based on the wind-resistant shelter developed after the 1997 cyclone in the Chittagong area. As a result of limited land availability, the covered area was reduced to 15m².

The core shelter was built on a mud plinth to protect from flooding. It was anchored to the soil by the 8 reinforced concrete columns with 5 feet deep foundations. The structure was braced, had a six-course brick base and a steel truss roof. The roof was connected to the structure through rigid connections to the columns. Roofing tin sheets were fixed according to cyclone resistance techniques.

The height of the core shelter allowed families to extend in all directions. It was designed with a wooden ring beam two metres from the ground so that a mezzanine floor could be built for emergency use during flooding and for safe storage of goods.

The walls were made from woven bamboo mats. These were found to be cost-effective, environmentally friendly and allowed families to replace or repair them.

Sanitation needs were addressed by other parts of the programme.

Implementation

For a test case after 6 weeks, five sample shelters were built with pit latrines and one pond sand filter. They were built following community consultations and a field survey for health and livelihood program development.

As a result of the technical review of the sample shelter, there was a need to reconsider some of the materials and techniques brought to the beneficiaries. To respond to time, quality and logistic challenges, it was decided to outsource construction to a contractor.

A consultant was hired for finalisation of core shelter design and technical monitoring during the construction.

Organisation

The operation established community committees in each of the targeted villages. These were elected by the communities, and had between 11 and 16 members. It also established management structures that tied together operations in shelter, health, water and sanitation, livelihoods, disaster risk reduction, capacity building and psychosocial support.

Contractors

Following tendering, the organisation took six weeks to awarding the contract. After contract signature, the contractor had 1 month for mobilization and construction of model shelters, and penalties for late completion. An advance of 10% was paid to the contractor. A percentage was withheld from the final payment to provide liability coverage for a one year period.

To ensure a good control of work progress, technical meetings were organized for each district fortnightly. Progress reports were due every week.

Training

Training events in safe shelter awareness were interactive and took about three hours. They were conducted in sessions attended by between 20 and 25 people, led by two people and monitored by one observer. Trainings were to help families to assess their shelter vulnerability, help families to strengthen their shelters (with focus on bracing, foundations and roofing), and to present toolkit components.

Toolkits

In the beginning of 2008, 5,000 toolkits were procured. However, the distribution was delayed until March 2009. They were distributed in 3 months.

The toolkit was purchased locally. Families liked the toolkits but would have preferred to have a hand-drill included. The nails, wire and brackets could be found in the repairs and extensions that families had built.

Cash Grant

To complete the shelter support, a cash grant was distributed to each beneficiary. This was to help with extensions and repairs. Cash grants were distributed at the end of the programme as a result of significant challenges faced.

Distribution of cash grants was through the government bank, which had a wide network in targeted communities. Families had to visit the bank branches to collect the cash grant. Distribution was done under strict verification and monitoring. The transaction process of the bank was really slow and could not cope with the demand of the operation.

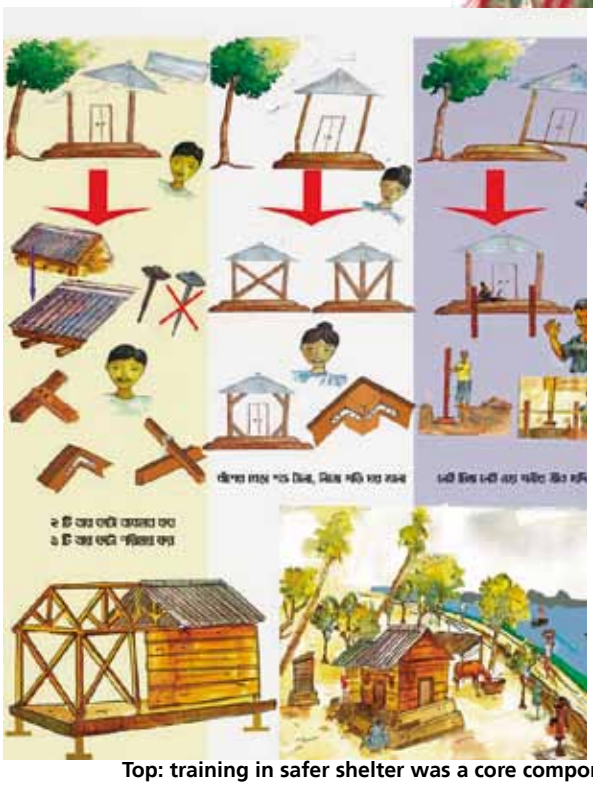
Logistics

To ensure the right thickness (0.45mm) of corrugated iron roofing sheets, the contractor had to buy 0.55mm thickness, or to import straight sheets from Japanese supplier and make them corrugated in Bangladesh. Samples were laboratory tested to validate thickness and galvanization levels.

The core shelter design kept the use of wood to a minimum. Timber quality and delays in delivery were one of the most critical parts of the project.

The purchase of timber, including certification of species, maturation and quality, were the responsibility to the project consultant.

Bamboo for the walls was procured from Chittagong, the main production area in Bangladesh. The structural bamboo grids were fixed on construction sites and precisely fixed to the structure with strong steel wires.



Top: training in safer shelter was a core component of the programme, Below: training poster developed for the Sidr Programmes
Photo: Xavier Génot, IFRC






The programme provided support for families to upgrade their shelters. Many families were able to make improvements and extensions from the core house (top left) to the various extended structures (above)
Photos: Xavier Génot, IFRC

B.4 China, Sichuan - 2008 - Earthquake

Case study: Cash distribution

Full case study

Country:
China
Disaster:
Sichuan Earthquake
Disaster date:
12 May 2008
Number of houses damaged:
5 million estimated.
Number of people displaced:
15 million estimated initially
Project target population:
63,000 families in 1 county in Sichuan
Occupancy rate on handover:
Expected to be near 100% at project completion
Shelter size:
Cash distribution project to support families with reconstruction of 50 - 150 m^2 houses
Materials cost per shelter:
60,000 to 120,000 RMB (9,000 USD -18,000 USD)
Project cost per shelter:
3,000 to 10,000 RMB (440 USD - 1,500USD)

Project timeline

Summary
Cash grants were distributed to around 63,000 rural households who fulfilled the selection criteria in Mianzhu County, Sichuan. Each household received the equivalent of 450 USD or 1500 USD (CNY 3,000 or 10,000) to help them to reconstruct earthquake damaged homes and housing related needs. As with most other aspects of the response, the government led on construction monitoring and training.

Strengths and weaknesses

✓ Very large-scale project.
✓ Cash distributions transferred directly into homeowners' bank accounts. This is different from most earthquake reconstruction funds in China which flowed through government managed accounts.
✓ Added transparency and error checking was made feasible by developing a beneficiary database.
✓ These funds make a significant difference to families' ability to pay down their debts, complete construction or buy essential furniture and household items.
✓ The government played a strong directive role, leading much of the project scope and activities.
× There were concerns about the potential for social instability resulting from inequality between original target area and their surrounding communities.
× There were multiple delays in developing a reliable list of names. As a result, homes were mostly built before funds were distributed.
× Limited and intermittent access to beneficiaries affected the organisations ability to monitor construction and guide on the technical issues.
× Given timeframes, technical support and training was no longer necessary or relevant.
× In some communities, only 30% of the population matched the criteria. This lead to dissatisfaction of those unable to receive funds.
× There were concerns that this cash distribution will negatively impact the effectiveness of the other programs within the same area.
× While originally conceived as a way to encourage earthquake-resistant construction practices, the final shelter support programme had no control over how beneficiaries use the funds.
- Government management of the construction process and quality control greatly simplified the scope and technical aspects of the project.

Reconstructed houses in Sichuan, built within two years of the Earthquake
Photo Melisa Tan

Before the earthquake

Most of the areas affected by the earthquake are fertile farming lands. The natural resources in the area are very rich, with all-year cultivation. Forests, orchards and water are in abundance in the area. A majority of families were engaged in farming, forestry and other local industries such as coal mining, livestock farming, tourism and other small businesses. Farmers form the largest livelihood group in the area with about 78% of the families engaged in both agricultural and livestock farming. The main crops are rice, wheat, rapeseed and corn and the main livestock are pigs, chickens, ducks and rabbits. The average farmland is 330m^2 to 1000m^2 per person.

Most of the farming was managed by people over 40 years old. Most of those below 40 years work as migrant workers in larger cities. The majority of people have very little or no savings at all (average 300 to 450USD per family).

First three months

The most powerful earthquake in 30 years with a magnitude of 7.9 struck on the afternoon of 12th May 2008, killing 70,000 people and leaving 12,000 missing. Hundreds of reservoirs were damaged and over 30 quake lakes (rivers blocked by landslides) were created.

The earthquake mainly affected three provinces: Sichuan, Gansu and Shaanxi. Continuous aftershocks along with mudslides and flooding made the situation worse for affected people. County towns like Beichuan and Wenchuan were completely devastated.

An estimated 15 million people were made homeless and displaced by the earthquake, including 4 million people in the city of Chengdu. Many people sheltered in makeshift structures or tents. People moved to other towns in neighbouring counties and provinces. In remote and rural areas many people continued living in surrounding villages due to a lack of access to safer areas.

The government built hundreds of thousands of pre-fabricated cabins to house those living in centralised rural and urban locations.

Industries, agriculture (farming, forestry, livestock), mining, tourism and small businesses were severely affected. The loss per person due to the earthquake was equivalent to 15 years of their disposable income (net income) in rural areas. In the urban areas it was equivalent to 15 times their total annual income.

3 months to 1 year

The government began an ambitious reconstruction project to build about 5 million houses across the 3 provinces within 2 years. By the 1 year anniversary, reports indicate reconstruction was well ahead of this deadline. By Sept 2009, nearly 95% of houses were completed in Sichuan. The govt also announced 12 May 2010 as the deadline for all non-government organisations to complete all earthquake reconstruction projects.

In first three months the implementing organisation distributed 100,000 family tents and 300,000 quilts.

The maximum amount of support which households received is the equivalent of 1500 USD and this is equivalent to about six years' worth of pre-earthquake disposable income for the average farmer (per capita).

The government offered building subsidies (equivalent to 1500 USD) for homes and loans that were first interest-free and then low-interest. However these were substantially less than the cost of a house.

20 months later

Many families had begun moving into their completed homes. However, many families were still building their homes, and many hoped to complete by Spring 2010.

The situation was slightly different for families living in very rural remote areas such as those living in the mountains. In many instances, coupled with a lack of funds, the lack of access to these hard-to-reach areas also affected reconstruction progress.

Implementation

The government was in charge of land allocation, preselection and qualification of construction teams, monitoring of materials suppliers, and the quality of construction.

Selection of beneficiaries

The main requirement was that the cash would support towards the reconstruction of rural houses that were damaged by the earthquake.

Selection criteria were:

- families who had lost a family member in the earthquake
- families whose family member sustained permanent disabilities (handicap) from the earthquake
- families with an elderly family member (above age 60)
- families with a family member who was already seriously ill prior to the earthquake (cancer, leukemia, mentally disabled).
- all families in one particular township that had to be relocated due to new geological hazards.

Once beneficiary lists were collected and verified, posters announcing the project and the selection criteria were posted in all villages. Trainings for 1,300 people to explain the project information were started. Beneficiary name lists were also posted publicly. After posting and a period for revisions, the list was locked and funds were distributed to 63,000 homeowners' bank accounts.

Reconstructed houses in Sichuan. These families were supported by cash grants. Photos: IFRC

B.5 D.R.C, Goma - 2002 - Volcano

Case study: Distribution and technical support

See Shelter Projects 2008 for more

Project type:
Materials distribution. Self-build, with technical support.

Disaster:
Democratic Republic of Congo, Goma volcano eruption, 2002

Number of houses damaged:
15,000 houses were destroyed and 87,000 people were made homeless.

Project target population:
Initially 3,000 families, increased to 5,000 (33%). Part of a joint intervention targeting 12,625 families (85% of the 15,000 affected)

Occupancy rate on handover:
All shelters completed.

Shelter size
24m². Total materials cost 180 USD, including plastic sheeting.

Project timeline

Oct 2002- – 1,307 families assisted

Mar 2002 - – First transitional shelters erected

Jan 2002- – Volcano erupts

Summary
Distribution of mostly locally-procured materials for beneficiaries to build their own transitional shelters on self-selected plots after the eruption of the volcano in Goma. The distribution was accompanied by technical support and distribution monitoring.

A temporary house built during this project
Photo: Graham Saunders

B.6 Haiti - 2008 - Flooding

Case study: Distribution, cash and training

Full case study

Disaster:
Hurricanes and tropical storms

Disaster date:
1st September 2009.

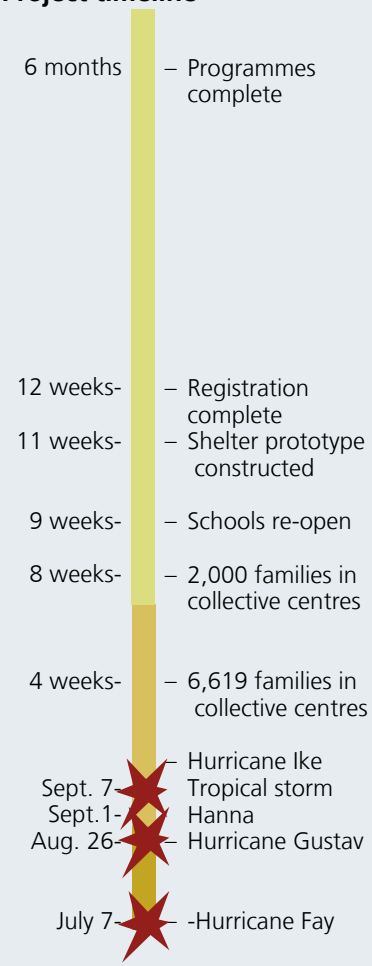
Number of people displaced:
165,337 families; half of the population of Gonaives were displaced.

Project target population:
Initially 60,000 people in collective centres. Later programmes targeted smaller numbers of those who had not returned
1000 family cash distribution
1222 families in timber framed shelters (735 half kits, 487 full kits) and cash to cover transport

Shelter size:
Cash was provided to support families to rent a room for six months.
Transitional shelter kits provided materials for an 18m² shelter

Occupancy rate
Unknown

Project timeline



Summary

These shelter projects were in the complex urban environment of Gonaives, Haiti. Multiple approaches were used to support families living in collective centres and temporary sites to return. Initially programmes focussed on distributions of shelter items and toolkits. Later programmes diversified to include cash to support families that were renting, and shelter materials and support for those who had identified land.

Strengths and weaknesses

✓ Programmes were able to adapt over the course of the emergency, taking into account changing conditions and learning from previous programme successes and challenges

✓ The programme ensured that families living in collective centres had options for return.

✓ Use of different sized transitional shelter kits allowed for support to be scaled according to needs

✓ Cash for those who rented shelters allowed families without land to be supported by the programme.

× By supporting families in collective centres and camps early on in the response, people were incouraged to remain displaced.

× Shelter tool kits were found to be of limited use for families who previously rented houses or whose houses remained buried.

× When distributions of return kits were made, it was not clear that those who received them would not qualify for future support in displacement locations. As a result, many families took the return kits but did not return.

- Despite prolonged negotiations, it was not possible to identify safe land on which to relocate those families whose houses remained at risk from future flooding.

- The funding was extremely limited for the response. This limited options and reduced the capacity of international organisations to provide support

- As the result of challenges in beneficiary identification, the project was not able to support host families to provide much of the shelter. However there were separate food distributions, cash for work, clean up programmes and water and sanitation programmes in the host communities within Gonaives.

Damage in Gonaives
Photo: Joseph Ashmore

Before the flooding

In 2004, the city of Gonaives was hit by tropical storm Jeanne. The ensuing flooding killed over 2000 people.

By 2008, the city of Gonaïves, had an estimated population of 300,000 people

After the flooding

In 2008, hurricanes and tropical storms Fay, Gustav, Hanna and Ike led to severe flooding. Eight percent of the Haitian population, were affected, 793 people were killed and crops were destroyed.

The town of Gonaives was most severely affected. 80 percent of the city was submerged under two metres of water. Although the death toll was lower, the damage was greater than in the floods of 2004. The receding flood waters left more than three million tons of mud.

Over half of the population of Gonaives was displaced, finding refuge with friends and family or in over 200 collective shelters in schools, churches and warehouses.

Major clean-up operations ran for many months. Many families were not able to return to their houses until the mud was cleared.

The response was significantly underfunded; the United Nations appeal reached only 40% of its target.

First return kits

In the first months after the flooding, relief items were distributed, with a focus on families living in collective centres.

The government kit consisted of one foam mattress, one sleeping bag, one blanket, one hygiene kit, and one jerry can.

The organisations involved agreed to distribute return kits which were intended to support families to repair their houses. These kits contained one reinforced tarpaulin, five corrugated iron sheets, and a tool kit (one saw, a hammer, a shovel, a trowel, 1kg of nails and two polypropylene sleeping mats).

Unfortunately, a significant number of families who received return kits remained in the collective centres. The kits proved to be of limited success because:

- Many families did not own a house that they could repair
- The kits were distributed unconditionally so that families were able to receive them and remain in collective centres awaiting further relief distributions
- The kits were suited to timber frame construction. In the city many of the shelters were built with blocks or masonry.

Collective centres

The need to restart schools and further pressure by the owners of the buildings that were being used as temporary accommodation lead to pressures to evict the affected families, but many had no other options. The closure of the first collective centre lead to the establishment of temporary sites with tents for shelter.

The implementing organisation supported the families on these tented sites by improving the site layout, and improving the drainage.

Finding a solution for those living with host families was a lower operational priority due to reduced risk of evictions, as well as significant challenges in identifying families.

As the programmes took place in an urban environment, identifying who actually lived where was challenging. Many families left a single family member in displacement sites to receive additional distributions. In some cases families had members in several sites.

Registration

Two months after the disaster, a survey was conducted to gain a better understanding of what was preventing families from returning home. All of the major organisations operating in Gonaives took part in these surveys, and registered the families. Teams surveyed families in the collective centres between 3am and 4am to ensure that those surveyed were in fact resident in the shelters.

Once families were registered, additional families would not be added to lists and would not be able to receive support.

Exact address and mobile phone numbers of those in collective centres were collected and houses were visited one by one to assess damage. Houses were assessed as being either destroyed or damaged.

When it was not possible to verify property titles through paperwork, ownership of houses was verified by discussions with those in the neighbourhood

The transparency of the process was a key part of it being accepted by the displaced families.

Implementation

After the registration, just over 2000 families were found to be remaining in the collective centres and sites. For these families two approaches were adopted. Depending

Hotel used as a collective centre
Photo: Joseph Ashmore

upon their circumstances, families would either:

- receive cash for rental or
- support with transitional shelter materials and construction.

Cash distribution

Approximately 1000 families remaining in collective centres received cash, up to an agreed value. This value was equivalent to a one year rental of a room for a family. To qualify for this, families living in collective centres either:

- were tenants prior to the disaster, and hence did not want to repair a houses belonging to someone else, or
- were owners whose home was still flooded or covered in mud or they lived less than 10m from a main city canal.

The distribution was conducted in partnership with another international organisation who distributed to approximately half of the families, using identical distribution and verification systems. The process for cash distribution was:

- Once assessed, families had a maximum of four days to rent a room for one year. People did not have any problems in finding somewhere to rent.
- The families would bring a signed a pre-agreement with landlord stating the rental rate. From this the maximum amount that the organisation would pay was agreed. The organisation would only pay rent up to an agreed maximum.
- The organisation would visit the house and verify with the landlord.
- The organisation would give agreed lists to the banks for the rental allowance to be paid direct to beneficiary.

Transitional shelters

Two types of repair or reconstruction kits were developed. These included materials to build an entire timber framed shelter (full reconstruction kit) or a reduced set of materials to repair damaged shelters (half repair kit). These kits were combined with technical assistance, and some cash for transport.

1,222 families (54% of the targeted families) living in non-school temporary shelters and tent sites received repair kits. Of these, 735 families received the smaller (half repair) kits and 487 received full reconstruction kits.

All kits were purchased by the implementing organisation and distributed with the assistance of partner organisations in three different sites in the city. Some of the materials were distributed through vouchers that the families could redeem for agreed shops within an allotted timeframe.

Given the various constraints, including budget deadlines and limitations it was decided that materials would be distributed in a one-off distribution rather than with a phased approach. This led to several families not building or completing shelters with the materials.

There were several cases where vouchers and distribution cards were faked. The organisation noted that harder-to-copy vouchers would be required for future programmes. The short time periods in which they could be redeemed helped to reduce the risk of forgeries.

The distributions were conducted in conjunction with one partner organisation provided technical support. There was additionally follow up and monitoring of families who had moved.

Closure

The programmes had proven very labour intensive, with multiple processes depending upon on previous processes. This did lead to delays but proved largely effective in offering families options away from collective centres.

Following the cash and materials distributions as well as public information, the numbers of people remaining in camps and collective centres was very small. Targeting the final families was then very easy.

As a result of the cash programme, rents did rise, but not excessively.

With the closure of collective centres, the organisation began a programme to rehabilitate them. This was followed by a nationwide assessment of building that could be used as collective centres in case of other disasters. Of these 40 were targeted for use as hurricane shelters. These buildings were repaired and upgraded to improve preparedness for future disasters.

Materials list

A full repair kit given to each family, allowed for construction of a floor slab, a frame and a roof of approx 18m^2. It was not enough for rendering the walls,

Material	Quantity
Wood (roof) (1" x 3" x 16')	10
Wood (frame) (2" x 4" x 12')	4
Wood (roof) (1" x 4" x 12')	6
Nails (3" 75mm x 3mm)	0.5kg
Nails (roofing) (3" 75mm x 3mm)	0.5kg
Cement	4 bags
Corrugated iron (1.8x0.9m)	16
Flat sheet for roof ridge	1

Families were responsible for masonry and sand. If rocks were not available they need 240 construction blocks (30x20x15 cm).

Tool kit to be shared between 5 families:

Material	Quantity
Spades	2
Wood saw (750mm)	2
Claw hammer	1
Bucket	2
Roll of wire	3
Tape measure	1
Trowel	2
Pick axe	2
Pliers	1
Sack	1

Prototype transitonal shelter
Photo: Joseph Ashmore

B.7 India, Gujarat - 2001 - Earthquake

Case study: NFIs and shelter construction

See Shelter Projects 2008 for more

Project type:
Non food item distribution
Self build transitional shelters
Technical support
Disaster:
Gujarat Earthquake, 26 Jan 2001
Houses damaged by disaster:
180,536 completely destroyed, 913,297 partially damaged
Project target population:
Over 23,000 families
Occupancy rate on handover:
Unknown
Shelter size
10m²
Approximately (4m x 2½m)

Project timeline

10 months –
- Shelter programme distributions complete.

2 months –
- NFI distribution complete
- All of initial management team have left

1 week –
- Identify funds
- Establish partnership with local NGO network
- Establish operations base and warehouse
- Begin distributions

36 hours –
- Assessment begins

26th Jan 2001 –
- Earthquake

Summary:
An international oganisation worked in partnership with a network of 22 local local organisations to rapidly implement an NFI distribution programme followed by a transitional shelter programme. More than 27,000 shelters were built. By working with local organisations, existing networks and local knowledge could be used to deliver materials effectively and to help construct shelters on a very large scale. The speed and scale of the programme combined with the different approaches of the international and the national organisations led to a lack of paper work that the donors required.

These school buildings were adapted from the transitional shelters. The low walls reduced the risk of masonry falling on occupants during future earthquakes. Photo: Chris Cattaway

B.8 Indonesia, Aceh - 2004 - Tsunami, earthquake

Case study: Shelter or housing?

See Shelter Projects 2008 for more

Project type:
Emergency NFI distribution

Land rights advocacy
Housing

Disaster:
Earthquake followed by Tsunami.

Houses damaged by disaster:
252,000 destroyed or partially destroyed, all within 5km of the coast

Project target population:
1,564 houses created in 28 villages in 7 regions.
All with house ownership certificates Land titles or certificates

Occupancy rate on handover:
95% in comparison to 79% for all of Aceh
Shelter size
36m² per family. All with additional water / sanitation facilities

Project timeline

- 3 years – Last houses handed over
- 2 years – Partners complete all houses
- 1 years – Rebuild low quality houses; Partners begin; 50% of houses complete
- 1 year – Shelter designs revised; 1600 houses promised
- 5 months – Construction begins
- 3 months – 1200 houses promised
- 2 weeks – Shelter planning begins; Emergency phase over; Distribution begins
- December 2004 – Earthquake and tsunami

Summary
This programme began with the concept of community built 'transitional' timber framed shelters, managed and implemented by the community over a period of months. Due to challenges of procuring legal or sustainable timber, local politics, the availability of significant funds and the number of other NGOs working in the area, the project evolved into a programme building houses made from reinforced concrete and brick. The programme lasted over three years. Towards the end of the programme, many of the shelters were built by partner organisations.

One of the completed shelters in Sigli, Aceh. Photo Joseph Ashmore

B.9 Jogyakarta - 2006 - Earthquake

Overview

See Shelter Projects 2008 for more

Summary

The earthquake struck the south eastern corner of the province of Jogyakarta in Central Java. More than 8,000 rural and peri-urban sub-villages were hit, leaving over two million people homeless.

The largest response was from a diversity of private actors and organisations. This was backed up by an international response which was accelerated by the preparedness activities which had been ongoing for the anticipated eruption of mount Merapi nearby.

The case studies here are of the phased responses of two organisations. Both organisations used cash grants either to individuals or to local organisations to implement the transitional shelter programmes

Before the earthquake

As there had not been a major earthquake in living memory, the quality of general construction in the province of Jogyakarta had slipped. When the 2006 earthquake struck, the level of housing damage was disproportionately high.

Immediately prior to the earthquake, the imminent threat of eruption from nearby Mount Merapi meant that several agencies in Jogyakarta were pre-positioned to respond to a disaster. As an example, one International organisations disaster response unit had over 10,000 tarpaulins warehoused in Jogyakarta and a fully-functioning office. This organisation was in an ideal position to respond very rapidly in the emergency phase of the shelter response.

The earthquake

The proportionally low levels of death and injury, when compared to infrastructure damage, resulted in comparatively low levels of social infrastructure damage. This combined with the disaster's proximity to the relatively unscathed major city of Jogjakarta, a major hub of university learning and activity by non-governmental organisations in Indonesia, provided a massive national capacity for the intranational humanitarian community to draw upon.

In the early stages of the disaster response, international funds and resources appeared to be extremely limited.

Few other sectors were as badly affected as the shelter sector. For example most families used private wells and septic tanks which remained largely functional, and high background hygiene levels, greatly reduced the needs for water, sanitation or hygiene assistance.

The Jogjakarta earthquake response became primarily a shelter disaster, and meant more than 50% of all agencies that (over 200) became involved in the shelter cluster that was set up to coordinate the response.

The semi-rural nature of most of the affected areas meant that there was space for temporary shelters amongst the rubble. People also desired to stay close to their remaining possessions and largely agricultural workplaces. As a result, the need for IDP camps was largely avoided.

Transitional shelter

Soon after the earthquake, the government of Indonesia committed to providing permanent housing to every affected family, announcing the one-step policy for a move directly from emergency to permanent housing.

With over 300,000 houses destroyed, initial government reluctance to support transitional shelter gave way to a cluster-wide strategic approach, to address the upcoming rainy season and the gap between emergency and transitional shelter.

With apparently limited funding, and therefore little conflict over operating areas (compared to the tsunami response in Aceh), the member organisations in the shelter cluster worked closely together to develop guidelines for locally appropriate transitional bamboo shelter. These were then taken on board across the cluster.

Resource management

In its response, the shelter cluster used about 5 million sticks of bamboo, the Indonesian government used about 3 million, and other communities used about 10-15 million: a total of about 25 million sticks of bamboo.

However, management of the growing clumps of bamboo was not integrated into the transitional shelter programmes. In response to the demand for bamboo, much bamboo was clear-felled or harvested using unsustainable techniques. Depending on the type of bamboo and how it was harvested, some areas will take 3-5 years to return to original stock, some might take 10 years, and some will not grow back.

The resultant environmental impact was significant. Although formal studies have not been carried out, it is likely that vast areas of bamboo forests were decimated, including entire valleys.

B.10 Jogyakarta - 2006 - Earthquake

Case study: Cash and transitional shelter

See Shelter Projects 2008 for more

Project type:
Transitional shelter, community built
Self-built, cash grants for materials
Skills transfer through volunteers living in communities

Disaster:
Jogyakarta, Central Java earthquake, May 24th 2006

Houses damaged by disaster:
303,000 destroyed or seriously affected

Project target population:
Built 12,250. this corresponds to 22.5% of the shelters that were recorded as built.

Occupancy rate on handover:
100% (according to independent student survey)

Shelter size
4x6m2. Minimum 2m height.

Project timeline

Summary:
This project developed a locally appropriate shelter design based on traditional building materials and construction techniques. It delivered cash with support to affected families to build their shelters. It set up a community-built transitional shelter program supported by hundreds of volunteers and provided extensive instructional and promotional materials including short training manuals, videos on CD, posters and radio adverts.

A transitional shelter built on the site of a destroyed house
Photo: IFRC

B.11 Jogyakarta - 2006 - Earthquake

Case study: Emergency and Transitional shelter

See Shelter Projects 2008 for more

Project type:
Plastic sheet distribution,
shelter upgrade,
Public information.

Disaster:
Jogyakarta, Central Java earthquake, May 24 2006

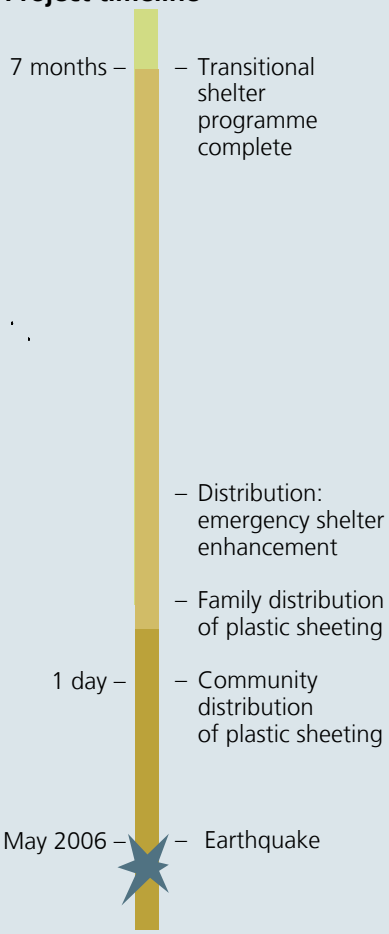
Houses damaged by disaster:
303,000 destroyed.
240,000 seriously damaged

Project target population:
Plastic sheeting: 75,000 families
Emergency shelter upgrade: 26,500 families
Transitional shelter program: 2,000 families

Occupancy rate on handover:
Nearly 100% usage and correct targeting

Shelter size
Plastic sheeting: Average 20-30 sheets per village. Phase 2: One 4mx6m sheet per family
Emergency shelter enhancement: walling and floor mats for 4m x 6m plastic sheeting.
Transitional shelter program: 24m^2.

Project timeline



Summary
This organisation implemented a four-part emergency shelter response which included: a distribution of tarpaulins for emergency shelter on a very broad Most vulnerable assessment, a 100% infill project, an emergency shelter enhancement program of tools, walling and bedding for 26,500 families, a broad public outreach and safety information program, and a small grants program for the design and construction of transitional shelters. All programs were fully designed in coordination with the shelter cluster, where the organisation played a lead technical advisory role.

Left: plastic sheeting was distributed during the emergency phase.
Centre and right: small grants were provided to help build transitonal shelters. Many different and innovative designs were built.
Photo Dave Hodgkin

B.12 Italy - 2009 - Earthquake

Overview

Summary

The earthquake of April 6th 2009 was the deadliest to hit Italy since 1980, and the first major earthquake in 300 years to hit the Abruzzo region. The town of L'Aquila was severely affected and is a historic town known for its university and the arts.

In the immediate aftermath of the earthquake, people moved into tents, hotels, or slept in holiday homes, with families or in their cars.

The government established a very prescriptive processes for sheltering affected families. Within one year, new apartment blocks and modular housing units were built to house families for 3 years. Cash grants were also provided for minor repairs.

Disaster overview

First assessments were that 55% of the buildings in L'Aquila were usable, 15% were usable with simple repairs, 20% were not usable, and the rest required further study. 50,000 buildings, including public buildings, offices and factories, were affected.

For search and rescue and subsequent operations, the civil protection were able to mobilise 12,000 volunteers after the earthquake. In addition, 2,300 firemen were mobilised.

A building damage assessment was conducted by 500-600 experts in teams of 2-3 people. Each team assessed 4-10 buildings per day, a total of 1000-1500 buildings every day. 50,000 buildings were assessed within two months.

In the immediate aftermath of the earthquake, the whole centre of L'Aquila was evacuated.

Sheltering policy

About 35,000 people moved into tents, 30,000 people moved into hotels made available on the coast, others moved into second homes or slept in their cars. It was estimated that up to 100,000 people were sleeping outside of their homes.

The aim of subsequent responses was to return as many people as possible back to their own homes as soon as possible.

To shelter families for the first three years, two types of building were developed:

- appartment blocks (185 buildings containing 4500 flats were built in the first year, housing 15,000 people)
- modular housing units (3475 were built in the first year housing 8500 people)
- cash grants for minor repairs and rental for families with agreed levels of building damage.

Buildings and housing schemes were designed to reduce seismic risks. They also included schemes to reduce energy consumption. Many included solar and photovoltaic panels, rainwater harvesting, and thermal and sound insulation

Left: tent camps,
Centre: modular housiung units
Right: apartment blocks
Photos: Dipartimento Protezione Civile
Croce Rossa Italiana

B.13 Italy - 2009 - Earthquake

Case study: Shelter construction

Full case study

Country:
Italy

Disaster:
Earthquake in Abruzzo region.

Disaster date:
April 6th 2009

Number of houses damaged:
23.500 classified as E to F, in other words, uninhabitable.

Number of people displaced:
70.000 homeless.

Project target population:
100 families in one fully destroyed village
Later developed into a 5 million Euro scheme

Occupancy rate on handover:
100% occupancy on completion. Will be occupied until original houses are rebuilt/ repaired.
The shelters have a 3 years use agreement but a 'life cycle' of 30 years.

Shelter size:
1-2 people (type A) 45 m^2,
3-4 people (type B) 52 m^2,
5-6 people (type C) 74 m^2.

Materials cost per shelter:
Total cost: 450 a 800 €/m^2.

Project timeline

Summary

The organisation used contractors to build three different sizes and designs of shelter for 100 families affected by the earthquake. This was a pilot programme, from which the government designed a programme to house an additional 3475 families. The government led the overall shelter process limiting the inputs of the disaster affected families, whilst the organisation, facilitated discussions to encourage involvement of the earthquake affectees.

Strengths and weaknesses

✓ There was strong cooperation between local / municipal authorities, local contractors and beneficiaries to define and develop the project.
✓ The first shelters with a design lifetime of 30 years were constructed within months
✓ Three different shelter designs were built and allocated based on the family composition.
✓ The organisation was able to act as a facilitator between the affected families and the authorities
✓ The pilot project was followed by the government's construction of 3475 additional units using a similar programme approach.
✓ The government provided all service infrastructre.
× Most of the decisions were government-led within a very prescriptive legal framework. This limited inputs by the affected population to suggesting preferences but not to take decisions.
× The project was limited to 100 families. This was due to limitations in the funds available combined with the high construction costs of the shelters. However the project did cover 100% of the community of Onna.
- There was very strong media pressure to deliver.

Modular housing units under construction
Photo: Fabio Torretta, Croce Rossa Italiana

Occupied modular housing units
Photo: Agostino Pacciani (IFRC/CRI)

Modular housing units

The organisation undertook a pilot programme to build 100 modular housing units. These units were fully serviced with fitted kitchens, bathrooms and electricity. The government was responsible for all services including roads.

Beneficiary selection

Onna was chosen because it had become the 'symbol' of the Abruzzi Earthquake. It is a village near l'Aquila home to 120 families, particularly affected by the earthquake. 80% of the houses were damaged and 20% of the houses were uninhabitable.

The funding, the identification of the resettlement areas, the project approval process and disbursement mechanisms were all agreed with the national civil protection authority and with the municipal authority.

The organisation working with a local non-governmental organisation set up by the inhabitants of Onna after the earthquake. Together, using criteria established by the government, they formed a list of who should receive the shelters. The list was delivered to the municipal authorities.

The local authorities of Onna were directly responsible for the selection of beneficiaries and their registration. The definitive official list fully respected the list that the international organisation had drawn up with the local organisation and the town's inhabitants.

The organisation facilitated for all of the affected families to have adequate housing, as they were entitled to by law. Criteria and measurable 'indicators' were established to ensure accountability.

Technical solutions

The decision to use timber framed prefabricated shelters was made for the following reasons:

- relatively high budgets were available as the disaster was in an industrialised country
- relatively high cost of labour for other types of construction
- an existing regional industry making prefabicated shelters
- The temporary shelters were prefabricated in the north of Italy, in the province of Trento, where there is a traditional in the construction of wooden homes.
- time pressures: although starting two months after the earthquake, the construction programme needed to be completed within three months (90 working days), before the autumn/winter season.

Three sizes of shelter unit were developed. These were

- 1-2 person units 45m^2
- 3-4 person units 52m^2
- 5-6 person units 72m^2

The total cost of the project for 100 households was five million euros. This included construction, provision of services and infrastructure.

Implementation

The organisation was fully aware that it had no adequate technical expertise to construct shelter to the scale and speed required. As a result it identified an implementing company to construct the shelters.

The organisation needed to ensure that quality standards were achieved, that administrative and legal procedure were correctly followed and that the programme was coherent. A staff of ten people were employed for the monitoring process. They supervised and monitored the programme by:

- Providing continuous technical assistance to anticipate arising problems and overcome bottlenecks that would cause delays.
- Regular visual checks and field visits and by 'remote control' though information management at the central office.

In addition to the construction, the organisation, working with the authorities, ran a public information campaign. This campaign was focussed towards donors to raise awareness on the construction programme. It accompanied activities with web-based updates. The campaign was based on press, media and events. The communication Service, working through the press office, led all the public information programme.

On completion, ownership of the shelters was handed over to the

authorities with the agreement that families would be able to occupy them rent free for three years.

Although the long term for the shelters was not finalised, it was anticipated that the reconstruction and restoration of the historic centre of Onna would take many years. When families do eventually return, these emergency shelters could be re-used as state housing. Alternatively, as L'Aquila has a strong identity as a university town, they could also be used as accommodation for students.

Top and left: occupied housing units
Bottom right: Units came with fitted kitchens
Photo: Agostino Pacciani (IFRC/CRI)

B.14 Mozambique - 2007 - Cyclone

Case study: Materials distribution and training

See Shelter Projects 2008 for more

Project type:
Distribution of shelter construction material packages. Training on improved building techniques.

Emergency:
Cyclone Favio in northern Inhambane, Mozambique, February 2007

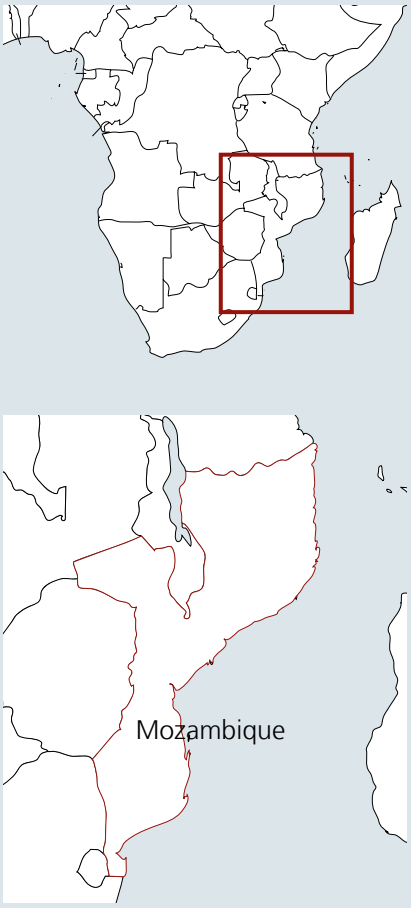
Number of houses damaged:
6,500 houses were damaged by the cyclone.

Number of people displaced:
160,000 were displaced by flooding and around

Project target population:
2,219 vulnerable households (11,095 people) who had remained on their own land.

Occupancy rate on handover:
15% of households had been unable to use the distributed materials to rebuild three months later. Of those who did, it was estimated that 95% of the people living in the rebuilt houses were the original beneficiaries.

Shelter size:
12m^2. This varied between designs and whether the structure was rebuilt or repaired.



Project timeline

Summary
Despite no previous shelter programming experience in the country, no emergency shelter stockpile and a delay in funding, the agency distributed shelter materials with technical advice to the most vulnerable people (child-headed households, widows, chronically ill, handicapped, etc) affected by the cyclone in two districts.

Left: a damaged house. Right: self-built reconstructed house using items distributed. Photo: Lizzie Babister

B.15 Myanmar - 2008 - Cyclone

Case study: Shelter construction

Full case study

Country:
Myanmar

Disaster:
Cyclone Nargis

Disaster date:
May 2008

No. of houses damaged:
Over 450,000 households affected in 36 townships. Over 350,000 households seriously affected.

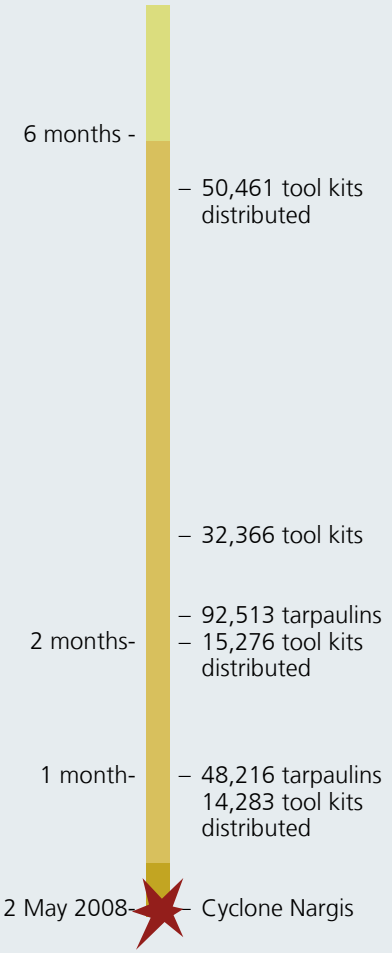
Project target population:
115,792 households received two tarpaulins each
Up to 250,000 households benefitted from 50, 461 shelter tool kits (one kit for five households).

Shelter size:
Two 4m x 6m tarpaulins per family

Occupancy rate:
High

Materials Cost per shelter:
30 USD per tool kit.
30 USD for two plastic tarpaulins.
Excluding transport and operational costs.

Project timeline



Summary
The relief phase of this programme was a large-scale distribution programme of plastic sheeting and tool kits. Two plastic sheets were given to each family, and each tool kit was shared by five families. It was followed by programmes to support smaller numbers of families to build their shelters and build cyclone-resistant community buildings.

Strengths and weaknesses

✓ Distribution allowed a large number of beneficiaries to be supported rapidly. By focussing on distribution, the shelter programmes were easier to manage.
✓ By distributing the tool kits to share between five households, the project reached five times as many people.
✓ Shelter kits and tarpaulins were particularly adapted to the warm wet environment. They were used not only for roofs but also for walls. They also made good tanks for water collection. Tents were generally disliked and not used.
✓ By establishing frame agreements with suppliers in advance of the disaster, the shelter kits contained good quality materials.
× The project was run as a distribution with limited shelter-specific inputs.
× There were some duplications with other organisations distributing to the same locations.
× Some of the emergency kits were delivered five or six months after the event. Many people had built shelters before the shelter kits arrived.
× Pressures to deliver large volumes of materials quickly may have reduced the support received by the most vulnerable individuals.
× Management structures suffered under the pressures of the emergency, and insufficient human resources were allocated to programme planning.
- It is very expensive to airfreight kits. Shipping also has associated costs. It may have been more effective to order fewer kits and use the rest of the money for early recovery activities.
- Beyond this individual programme, the needs of a significant number of families were not been met by the response to the cyclone

Plastic sheeting fixed to shelters by owners
Photo: Steve Barton

Before the disaster

There were very few organisations working in the area prior to the cyclone, and very little available knowledge of the specific disaster resistance or vulnerability of shelters.

After the disaster

Cyclone Nargis struck Myanmar on 2 and 3 May 2008. Collective assessment data from the authorities and international communities indicated that 115 townships were significantly affected by the cyclone. According to official figures, 84,500 people were killed and 53,800 missing. In larger villages and urban areas where there were more permanent structures, the mortality rate was lower. The United Nations estimated that 2.4 million people were affected.

The cyclone created wind, water and storm surge damage. The storm surge was reportedly 3.5 metres high in many areas and up to 7 metres at its worst.

The hardest hit areas included smaller rural farming and fishing villages of less than 100 households. In some cases these were completely destroyed, resulting in many lives lost. Housing in these areas is largely of simple timber, bamboo and thatch construction. Along the Irrawady river delta in the southern part of the country more than 95 percent of the houses where destroyed.

In the following three months, the majority of families recovered on their own although to a lesser standard than before the cyclone, leaving them more vulnerable to future cyclones. Damage in urban areas was less severe and rough building repairs were largely completed in the first three months after the cyclone.

Selection of beneficiaries

Distributions were targeted at all families who had lost their house

The most vulnerable groups of people were migrants, casual workers and 'landless' people who were disadvantaged before Nargis. The issues these groups faced after the cyclone increased due to the limited livelihood opportunities after the cyclone. In some cases, these people are not able to receive support because they are 'landless'.

Implementation

Distributions focused on the townships that were most seriously affected. As community participation was essential to the recovery process, 147 village tract recovery committees were established in all 11 townships where full recovery programming were planned.

Technical solutions

It was decided to distribute shelter tool kits and plastic sheeting for the emergency response. The reasons for this are listed below:

The shelter kits provide tools and materials to help people rebuild. Disaster-affected households could combine the kit with existing materials either salvaged, locally harvested or purchased with available resources. The materials provided can be reused if the households need to relocate or construct more permanent homes, and the tools will remain of use as the households upgrade or maintain the houses.

The shelter kits allowed for large numbers of people to be supported with limited funds. The price of a shelter kit is approximately 60 US dollars, whilst a standard one-family tent to internationally agreed standards can cost up to four times as much. The use of Shelter Kits provides the opportunity for maximising the shelter assistance that can be provided with available financial resources.

Existing stockpiles allowed for rapid distribution.

The shelter kits did not require specialist handling. In the field, individual Shelter Kits can be transported by recipients by hand if required.

To help meet the large-scale shelter needs, it was decided to split shelter kits to provide two tarpaulins to each target household & 1 tool kit to five households

88.7% of the total amount of tarpaulin was used for shelter and 11.3% of the tarpaulins were used for rain water harvesting, covering the harvested paddy and other purposes.

Half of the households who received tarpaulins received the tarpaulins two months after Nargis. Only 3.4% of the households received them within a month and 21% received them one month after Nargis.

Although 23% of the households received the tarpaulin 3

A basic delta shelter and a shelter repaired with plastic sheet
Photo: Steve Barton

months after Nargis, 77 percent of the households received the tarpaulin in just the right season (basically before the rains came in hard)

18 percent of the total households had already rebuilt the new shelter by using tarpaulin, community tool kits and locally available raw materials. The household tarpaulin kit and community tool kit were not only useful for building an emergency shelter but also for rebuilding the new shelters.

Emergency shelter was made of recovered wood (45.3%) and locally available traditional sources of building materials such as bamboo (32%) and areca palm (22.7%). They also used the recovered bamboo (46.8%) and areca palm (53.2%) for the floor. Tarpaulin was mostly used for the roof (83.9%). In some cases, it was also used for the walls (25.8%).

The majority of houses were built by disaster affected families. A small number received support from volunteers and community members. 88.3% of households surveyed could not improve their shelter due to lack of money.

The distribution of the toolkits supported people to recover when the people receiving them had good access to materials, had disposable incomes or were living within or in close proximity to urban areas. Otherwise the amount of support that they provided was limited.

"The extent and speed of relief activities from the international sector was limited and slow (at least at the beginning of the operation). This was primarily due to the restrictions on access for the international relief workers to the most affected areas in the Delta."
Programme review

Plastic sheet and tools distributions
Photo: Steve Barton

Logistics and materials

The shelter kits and plastic sheeting were internationally procured. The first relief flight to Yangon was within days of the cyclone, and lasted for four hours. It contained 300 kits and plastic sheeting. After the initial emergency phase, kits and tarpaulins were shipped to Yangon port.

For a tool kit with two tarpaulins, the airfreight cost was 120 USD per kit. For the same kit by sea, the shipping cost 2.25 USD.

Nine logistics hubs were established so that materials could be warehoused locally.

Information on shelter kit distribution was provided to the village leaders so that they could share this information with the community before distribution. In a few cases local staff informed the community members about the shelter kit distribution directly.

30% of the families received instruction on the use of the kit. Instructions were provided to village leaders as well as at some distribution points.

In the case of the community tool kit, there were two types of distribution methods: splitting the kit into separate elements which then were distributed to individual households, and distributing the whole kit to a group of five households to share the kit.

The vast majority of families surveyed afterwards said that the tools were useful and of good quality

40% of families said that the roofing nails were not useful as they were of a different type to those used locally.

Materials lists

Materials distributed per family

Item	Quantity
Tarpaulins	2
Rope	30m
10-litre jerry can	1
Blankets	2
Kitchen set	1
Double impregnated mosquito net	2
Family hygeine kit	1

Toolkit, shared between five families

Item	Quantity
Hoe	1
Machete	1
Tin snips	1
Hand saw	1
Roofing nails	500g
Shovel	1
Nails	500g
Tie wire	500g
Claw hammer	1
Woven sack	1

Classroom built with plastic sheeting
Photo: Steve Barton

Plastic sheet used to collect rainwater
Photo: Steve Barton

B.16 Pakistan - 2005 - Earthquake

Overview

See Shelter Projects 2008 for more

Summary

The earthquake in North Eastern Pakistan on 8th October 2005, left over 3,500,000 people with damaged or destroyed shelter. The earthquake struck in a mountainous region with winter only months away.

Of the many responses to the earthquake, this book contains two case studies of emergency shelter programmes. Both were conducted to support people through the first winter. The first project is the construction of transitional shelters with a phased delivery of materials. The second project is the distribution of shelter materials and toolkits.

Population movements

The Pakistan earthquake of October 2005 occurred in a region with difficult access months before the onset of winter. There were significant concerns that cold, and, at higher altitudes snow, could lead to significant further loss of life with an estimated 3.5 million people left homeless and 600,000 damaged or destroyed houses. Most of these houses were in rural areas.

Pre-earthquake - people live in mountains, both above and below the snow line and in cities.

Earthquake strikes. Many people stay, some people move from mountains, to regional cities and to larger cities. Some are forced to live in camps.

Over the course of several years, people reconstruct their houses and return, although some people remain permanently displaced

Illustrations Elizabeth Babister

Following the earthquake, many people remained on their land, often for fear of losing their land entitlement. However many others moved towards larger and less affected cities, either staying with family members, renting, or staying in temporary shelters on unoccupied land. Around 80,000 people moved into formal planned camps. After three years, 1800 families were verified to have lost their land through land slides. A further 4000 families had not had the status of their land verified.

After the first winter there was a large-scale return for those who still had access to land despite concerns of landslides with the following summer's monsoons. By the second winter, a year after the earthquake, most people had returned, but 30,000 people still remained in camps. Many of these people had either lost their land in landslides or were from urban environments where they previously rented or squatted.

The earthquake

The longer term policy for reconstruction adopted by the government was one of self build with distributions of approximately 3000 USD per family. Additionally, regional training centres were set up to support construction practices that were safer against earthquakes.

The major source of support for affected people was in the form of remittances from other parts of Pakistan and overseas, often from family members who had moved away to work. Additional support to affected people was in the form of donations of goods from other parts of Pakistan, especially of food and clothing, in the first weeks after the earthquake.

A large-scale humanitarian response grew up over the first month, with the key actors being the government of Pakistan (largely operating through the Pakistani military) and the national and international humanitarian community.

Assistance provided

There were multiple approaches taken by different organisations and the Government of Pakistan to support the emergency response during the first winter after the earthquake. These included:

- the distribution of tents, blankets and plastic sheeting
- toolkits with corrugated iron sheeting to support self build
- a variety of shelter designs using distributed corrugated iron and tools, and locally available materials including reclaimed timber
- earthquake resistant construction Training
- cash for work and distributions of small amounts of cash
- set up and management of camps for those who were displaced
- rubble removal

B.17 Pakistan - 2005 - Earthquake

Case study: Transitional shelter construction

See Shelter Projects 2008 for more

Project type:
Transitional shelters
Tools
Self build, cash for work
Technical support

Disaster:
South Asia Earthquake
8th Oct 2005

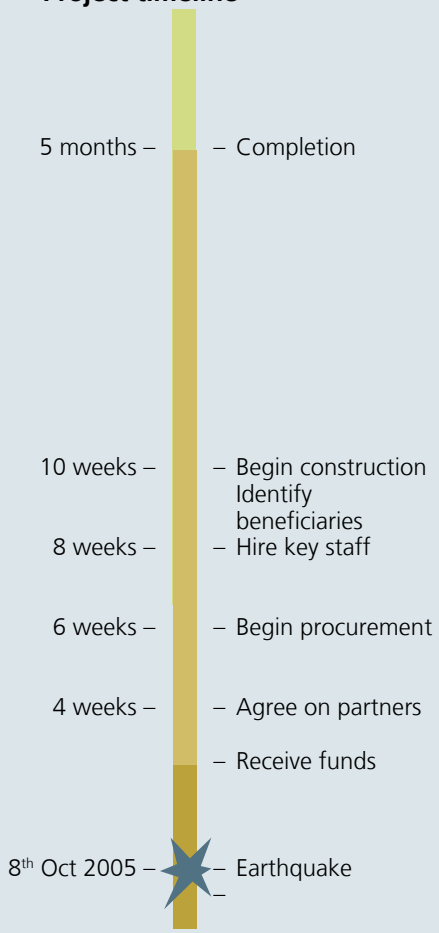
Houses damaged by disaster:
600,000. Over 90% in rural locations

Project target population:
1125 families with shelter and an additional corrugated iron distribution to 657 families. This accounts for approximately 0.2% of the affected population.

Occupancy rate on handover:
Over 95% occupancy for the first 3 months. Over 50 % of these stayed in the shelters for the next two years.
Nearly one third of the shelters were still occupied after 2 ½ years.

Shelter size
6.5m² - 10.5m² for people.
2m² to 3m² for livestock.

Project timeline



Summary:
A project to build transitional shelters according to one basic design. The shelters used reclaimed materials as well as distributed materials and toolkits. Cash for work, carpenters, and technical support were also provided. The project was a combination of direct implementation by a lead organisation by its partner organisations.

Building one of the transitional shelters
Photos: Albert Reichart

B.18 Pakistan - 2005 - Earthquake

Case study: Shelter materials distribution

See Shelter Projects 2008 for more

Project type:
Transitional shelters.
Distribution of household non food Items
Corrugated iron and tool kits

Disaster:
South Asia earthquake
8th 0ctober 2005

Houses damaged by disaster:
600,000; over 90% in rural locations.

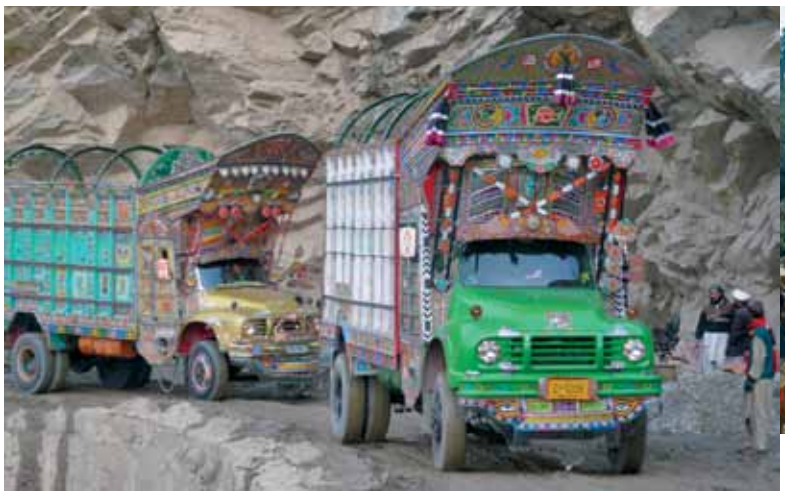
Project target population:
15,900 families were provided with corrugated iron sheets and basic tools to build transitional homes.
Around 11,000 families quilts and household items

Occupancy rate on handover:
Unknown

Shelter size:
6mx4m of plastic sheeting and 22m² of corrugated Iron. This equates to approximately 18m² covered space per family.

Project timeline

Summary:
An international NGO ran a distribution programme to over 15000 families in areas with difficult access, validating each beneficiary family with field teams. Once supply lines were established, a large scale programme could be set up delivering blankets, plastic sheeting corrugated iron, toolkits including fixings, as well as some stoves and buckets. As a result of the rapid set-up of the programme, the scale of the procurement, and staffing challenges, consultations on the material items were limited leading to varying levels of satisfaction between project areas.



Toolkits and corrugted iron were distributed
Photos: Joseph Ashmore

B.19 Peru - 2007 - Earthquake

Overview

See Shelter Projects 2008 for more

Summary

On August 15th, 2007 there were two major quakes separated by nearly one minute. It was followed by a 3m tsunami that caused some damage along the coast line. The earthquake killed nearly 600 people and injured more than 1,800. 48,000 houses were destroyed, and a further 45,000 houses rendered uninhabitable. in total 140,000 households were affected. The majority of the affected population lived in towns. The three case studies in thsi book were responses by non-governmental organisations. One rapidly distributed construction materials using existing community structures, one built shelters providing some cash for work on the shelters, and one used contractors to build shelters with the shelter owners. All of these projects worked with those who already owned land.

Earthquake location

The area most affected is situated in a desert area with high temperature variations and little or no rainfall. In the more mountainous areas affected, cold was a severe problem.

Access was significantly easier in the towns in the coastal area, and responses were correspondingly swifter and larger. Much of the response in the first weeks was from within the country.

Response

The major focus of most responses was to support people to build on their own land. This left gaps for the landless who did not qualify for many assistance projects. For the landless, some projects provided shelter materials that could be later transported as land became available.

The shelter responses included:

- distribution of blankets, plastic sheeting, cook sets and other shelter items
- distribution of tents
- support with the construction of standard shelters through cash for work, training and carpenters,
- support with rubble clearance in coordination with the local authorities

Government response

The government of Peru based their response on a plan developed by the Colombian government. Actions were divided into four stages, each with its own setup and responsibilities (emergency – transition – reconstruction – termination). After 8 months, the transition gave way to reconstruction.

Fifteen days after the earthquake, the central Peruvian government created a reconstruction agency called FORSUR. FORSUR had a mandate to rebuild houses and infrastructure.

Five months after the earthquake, the Peruvian Ministry of Housing began distributing bonds for approximately 2,000 USD to affected families who had land titles to their properties. These bonds were to help people to purchase materials to rebuild homes. Families without land titles do not have access to this state program.

Rubble

By January 2008 only one quarter of the rubble, a total of 2.066 million cubic metres of 7.8 million cubic metres, had been removed. Rubble removal did not advance as quickly in rural regions further inland.

Some programmes supported people to build lightweight shelters so that landless people could benefit from assistance programmes
Photo: IFRC

B.20 Peru - 2007 - Earthquake

Case study: Community mobilisation

See Shelter Projects 2008 for more

Project type:
Community mobilisation, shelter construction, materials distribution, Self build, training manual distributed.

Disaster:
Peru Earthquake, August 15th 2007

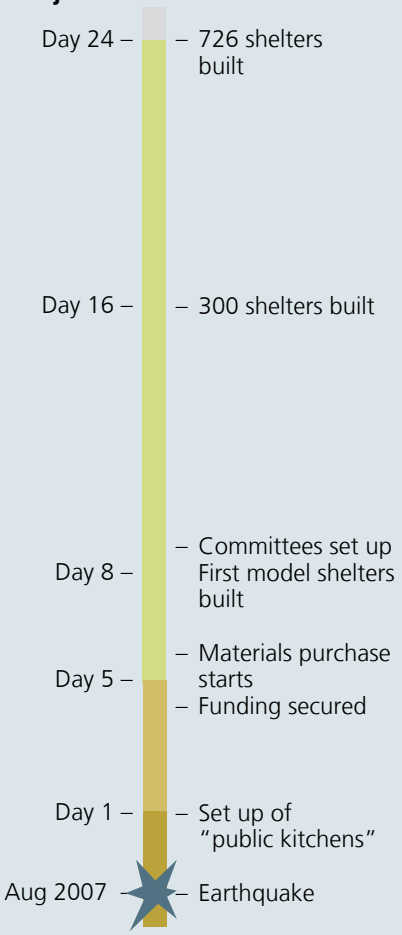
Houses damaged:
Over 48,000 houses destroyed.
45,000 unihabitable

Project target population:
726 families. Slightly less than 1% of the earthquake affected population

Occupancy rate on handover:
Very high.

Shelter size
Materials distributed to create 9m² covered space per family, to be supplemented by reclaimed materials.

Project timeline



Summary
Following the earthquake of August 15th 2007 near Pisco Peru, a local NGO set up 40 neighbourhood public kitchens. These became a means to mobilise communities to distribute re-usable construction materials for those most in need. Materials were selected that would have a longer lifetime than just the emergency phase. Technical support was provided in the form of a manual that had been written before the earthquake, and carpenters who provided technical support where it was needed most. The speed of response was possible due to the presence of the implementing NGO on the ground prior to the emergency.

Following its running of community kitchens in the immediate aftermath of the earthquake, a local NGO wsa able to mobilise communities to build shelters rapidly.
Photo: PREDES

B.21 Peru - 2007 - Earthquake

Case study: Self build transitional shelters

See Shelter Projects 2008 for more

Project type:
Transitional shelter construction
Self build
Rubble removal

Disaster:
Peru Earthquake August 15th 2007

Number of houses damaged:
Over 48,000 houses destroyed. 45,000 unihabitable

Project target population:
706 families, 3500 people - slightly less than1% of the earthquake affected population.

Occupancy rate on handover:
Very high

Shelter size
18m² covered space per family.

Project timeline

Summary
An international NGO with no pre-disaster presence in the area implemented a programme to build emergency shelters made from reed mats, plastic sheeting, cement, and wooden poles. The project was part of a larger programme that put particular emphasis upon livelihoods for the affected population. Additionally it integrated the shelter programme with water and sanitation interventions.

The organisation provided materials and some carpenters to help withh the construction.
Photos: Eddie Argenal

B.22 Peru - 2007 - Earthquake

Case study: Prefabricated transitional shelters

See Shelter Projects 2008 for more

Project type:
Transitional shelter construction
Shelter components pre-fabricated by contractors
Shelters assembled by homeowners.

Disaster:
Earthquake.
August 15th 2007

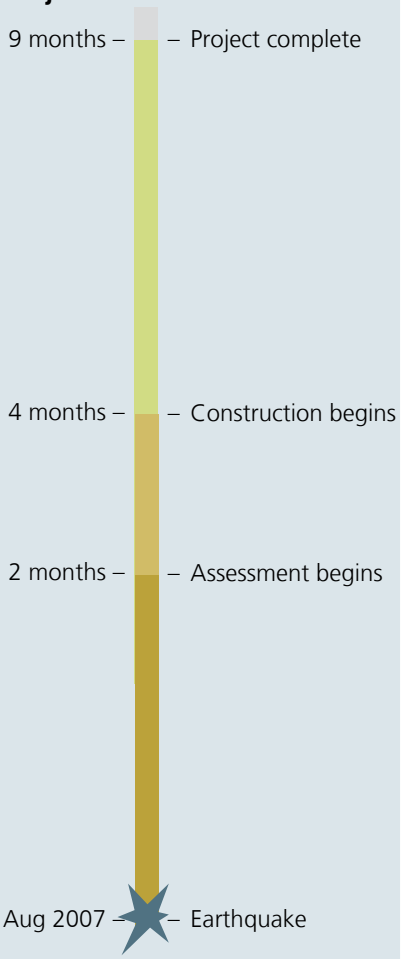
Number of houses damaged:
Over 48,000 houses destroyed. 45,000 made unihabitable.

Project target population:
1,900 families in five selected communities.
An additional 120 shelters were requested by the government to help house those left landless by the earthquake.

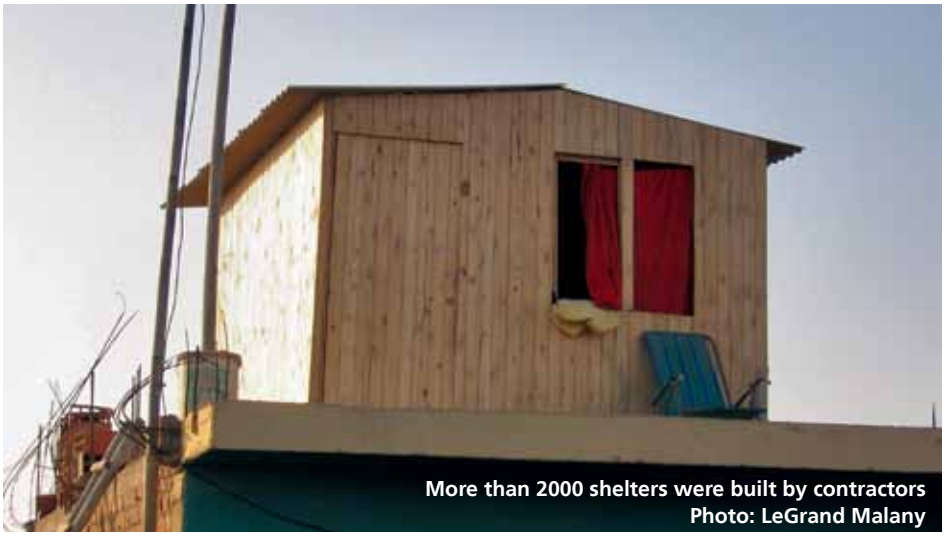
Occupancy rate on handover:
Very high

Shelter size
Materials distributed to create 18m² covered space per family.

Project timeline



Summary
As part of a larger post-earthquake programme, an international organisation hired a contractor to provide materials, equipment, tools, and skilled tradesmen for the prefabrication of 1900 shelters. The contractor was also responsible for training all volunteer labour as needed, but was not responsible for providing land. By prefabricating wall panels and, window frames, and by cutting timber on site, the supplier was able to cut costs. Homeowners themselves assembled the shelters.



More than 2000 shelters were built by contractors
Photo: LeGrand Malany

B.23 Sri Lanka - 2004 - Tsunami

Overview

See Shelter Projects 2008 for more

Summary

The tsunami of 26 December 2004 hit Sri Lanka two hours after the initial earthquake and killed over 35,000 people along the eastern and southern coasts. It destroyed approximately 100,000 houses and damaged or destroyed much of the infrastructure and public buildings in the affected areas.

The shelter strategy developed for much of Sri Lanka focussed on the construction of transitional shelters to bridge the gap until permanent shelters could be built. This case study is one of such transitional shelter project, where an international organisation provided metal-framed shelters that people could erect on their own plots of land.

Shelter strategy

In the areas of Sri Lanka controlled by the national government, a national 'transitional shelter' strategy was adopted.

The general principles of the shelter strategy were founded on Sphere standards, but were expanded to describe a transitional process, looking beyond emergency needs, and taking into account the need to support livelihoods.

The international scale of the disaster, and the intense media attention it had received, meant that there were large amounts of funding available, and a great number of organisations wishing to become involved. This was recognised when the strategy was formed.

The technical design aspects of the strategy would give a per-shelter budget, and a series of spatial guidelines (minimum indoor space, minimum height, etc.). Within those guidelines, humanitarian organisations and communities were free to make their own specific shelter designs. In most cases, the shelters were single-family huts, built with varying levels of input from beneficiary groups, using a mixture of wood, metal-frame, roofing sheet and concrete-block materials.

Coastal Buffer zone

The national government insisted upon a coastal buffer zone. Construction was excluded 100m from the high-tide mark in the south and west, and 200m in other areas. This created major challenges in finding land on which to rebuild, causing many families to move far from their livelihoods, and forcing many camps to be created

Coordination

Within the shelter sector, coordination was generally good, with full participation from government at both national and local level. However, in many areas, up to 60% of the shelter support was provided by small organisations. Many of these had little previous disaster experience, and were often involved for only short periods of time.

Levels of support

Different levels of support were given to those who had been affected by the tsunami, and those who had been affected by the armed conflict in the north and east. This led to tensions and difficulties for many ongoing development projects.

Emergency shelter needs

Many family found temporary shelter Immediately after the tsunami in public buildings such as temples or with host families. In the weeks that followed, many were able to make some basic repairs to houses, whilst others lived in tents until the transitional shelters were constructed.

After the first year

Government numbers showed that all affected families had been provided with transitional shelter by mid-2005. However, permanent housing would take significantly longer.

Many humanitarian organisations were only funded for the initial 6-9 month emergency and transitional periods, and there were often gaps in the handover to other organisations who could support permanent reconstruction.

Despite the incentives of government grants, many families rebuilt houses which were not resistant to the common hazards of cyclones and floods. Remittances from relatives living abroad and grants from smaller charities made it more difficult to ensure quality in construction.

Due to the length of time required to build permanent shelters, the UN and other organisations advocated for the upgrading and maintenance of the large number of the transitional shelters. They were aware that some families would be living in them for some years to come.

B.24 Sri Lanka - 2004 - Tsunami

Case study: Transitional shelter construction

See Shelter Projects 2008 for more

Project type:
Transitional shelter construction

Disaster:
Indian Ocean tsunami, 26 December 2004

Houses damaged by disaster:
100,000 nationally; 5,500 in the area where the NGO was working

Project target population:
1,500 families (Januray 2005), then reduced to 1,000 families (March 2005). Final total of approximately 850 families.

Occupancy rate on handover:
Estimated at 90%

Shelter size:
8.6m² (200ft²). Later upgraded to approximately 20.5m² with enclosable veranda space

Project timeline

Summary:
Using easy-to-construct and easy-to-carry metal frame shelters adapted from previous Sri Lanka programmes, the implementing organisation was able to support affected families on in 27 different villages along the coastline. The project avoided the creation of large camps, instead focussing on helping people to build customary plots of land, whither belonging to themselves or negotiated from land owners.

The shelters had a metal frame and a corrugated iron roof
Photo: Jim Kennedy

B.25 Uganda - 2007 - Slow onset floods

Case study: Materials and public information

Full case study

Country:
Uganda - Katakwi and Amuria districts

Disaster:
Floods

Disaster date:
Between July and mid September 2007

No of houses damaged:
More than 20,000 households were severely affected

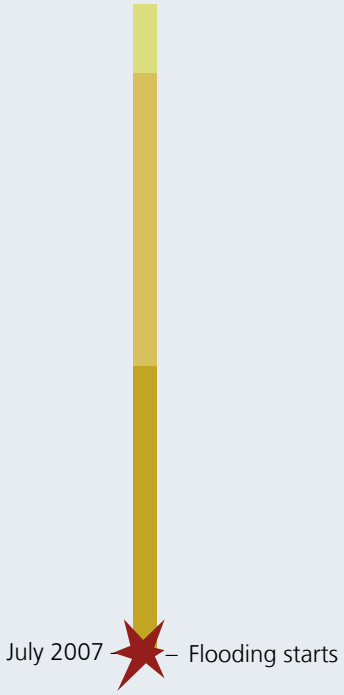
No of people displaced:
58,000 people

Project target population:
100.000 families located in 96 villages

Occupancy rate on handover:
7458 shelter completed

Shelter size:
Traditional round hut 12m^2 with veranda

Project timeline



Summary

10,000 plastic sheets were distributed during the relief phase. These were for temporary roofing materials in the absence of grass, and were also used to prevent rain from destroying walls and moulded bricks.

To ensure that communities rebuilt more flood resistant shelters, both communal and individual tool kits were distributed. These were combined with a large scale public information program on building back safer.

As the traditional building season was three months after the floods, during the dry season, the project had components of water, sanitation and agriculture. The approach taken was to work through community mobilisation.

Strengths and Weaknesses

✓ The programme worked in many sectors including distribution, water and sanitation and health activities. The assessment included a multi-sectoral team

✓ A shelter specialist was rapidly deployed to support programmes.

✓ The emergency Items arrived within 2-3 weeks of the floods. This was possible because there was an existing emergency stockpile in Nairobi.

✓ The project used large scale public information and participation to empower communities.

✓ A simple technical solution was used, based on simple improvements to a traditional construction.

✓ Different organisations operated in different geographical areas. This helped to avoid duplication.

✓ A combination of communal kits and individual kits helped the organisation to target more families.

✓ The international organisation worked with a national partner that was strong in community mobilisation.

× The recovery process was slow due to bad weather.

× The government had already started housing programs (concrete blocks and iron sheeting) which were often too expensive for the affected population.

× There was some resistance towards earth and thatch buildings.

× The national partner organisation had a lack of experience in shelter projects.

A boy walks past a flooded house
Photo: Jacob Dall

View of a village after the floods showing the traditional circular shelters. Photo: IFRC

Before the disaster

For 20 years, Katakwi and Amuria districts of Eastern Uganda were controlled by the Lords Resistance Army and affected by Karamajong raids from the North. Although security had improved as a result of presence of the army and police forces, many people remained afraid, preferring to sleep at night in clusters in camps rather than returning to their family plots.

The traditional local shelter design is a round mud hut with a thatched roof.

The majority of the families are engaged in farming and other small businesses. The main crops are sorghum and cassava, but the crops had not been harvested before the floods struck.

After the disaster

Heavy rains in the East of Uganda caused slow-onset floods that damaged houses in the camps and destroyed crops in the fields.

Programme overview

To reduce the impact of floods in the region, the program focused on improved prevention and preparedness. It also used local building knowledge to improve the houses.

The supported shelter programmes improved awareness on how to rebuild more safely as well as providing tools and grants.

Selection of beneficiaries

Through coordination meetings, the area was split geographically between organisations.

The shelter project focused on twenty camps and promoted community awareness, participation and technical awareness. The project combined interventions in many different sectors such as camp planning and water and sanitation.

The programme paid less attention to individual needs. It focussed instead on information sharing and the distribution of communal tools. The tools could be used for shelter, road works, agriculture, and other uses.

Implementation

- 10,000 tarpaulins and 2000 communal kits were distributed
- Technical awareness posters were distributed
- Prototypes shelters were erected with the community

The project trained sixteen members of the partner organisation to support 224 community volunteers. These volunteers were active within camps.

Affected families themselves built the shelters whilst volunteers monitored the construction.

Technical solutions

In the initial emergency phase, plastic sheeting was distributed along with other materials.

A list of necessary but lacking tools was drawn up with the community. These would be required to help families to reconstruct their traditional earth dwellings.

Information, education and communication materials such as posters were produced. These showed improved earth construction, and illustrated the following details to protect the house from flooding or termites:

- The house and foundations should be elevated.
- Foundations should be built with a large plinth beam of wattle and daub. This would need to be repaired by house owners after each small flood
- A water proof barrier should be put the foundations to protect the walls and floors which are made of adobe blocks.
- Walls made of sun dried mud blocks should be conical in shape
- Proper materials to build more resistant earth blocks should be identified. Examples are clay from termite hills, and using mud mixed with cow dung to protect against termites.
- Wood in direct contact with the earth should be trated to protect it from termites.

Material lists

The communal kit contained: a wheelbarrow, a hammer, a wood saw, a claw hammer, a machete, a hoe, an axe, a pick axe, a sharpening tool, a tape measure, a spirit level, a dumpy level and a first aid kit.

The household kit contained: a sickle, brick making moulds, damp proof membrane (polythene sheeting), anti termite treatment for wood, sisal roll, nails, a 20 litre Jerry can, a medium trowel, a window shutter, a door shutter, and wire.

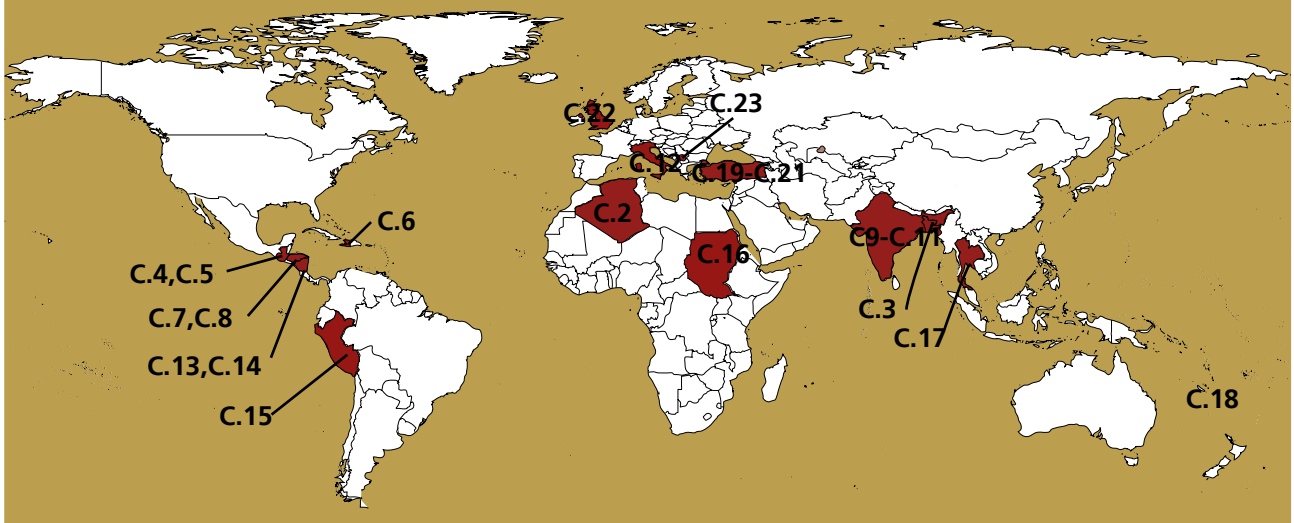
House under construction with improved plinth
Photo: IFRC

Public information images on proper site planning with space between buildings
Image credit: IFRC

Images from public information posters on building a flood resistant structure: (1) elevate the plinth and put a plastic sheet under the floor (2) fold the plastic sheet over the ground level ring beam (3) build conical walls (4) thatch the roof, render the walls with mud and elevate the area around the house to protect it from flooding
Image credit: IFRC

SECTION C

Historical case studies - from the archives



C.1 Historical Introduction - by Ian Davis

It has been fascinating to revisit these historical case studies that have triggered some reflections I have been encouraged to share.

Almost thirty years ago I compiled the original case studies for the UNDRO 'Shelter after Disaster: Guidelines for Assisting Groups', that have been drawn on in collecting examples for the current publication. This material was adapted from my PhD, an epic assignment that took all of 12 years to complete in UCL in 1985. This was on the same topic as the UN Guidelines. However, many of these case studies first appeared in print in my first book 'Shelter after Disaster' (1978, Oxford Polytechnic Press).

I also had the good fortune to work closely with Fred Cuny during the 1970s and 1980s, as we developed these case studies together, with the valued support of many colleagues. I am delighted that Fred's important and highly innovative work in Haiti is being reproduced with support from the Cuny Center as a vital contribution to current reconstruction efforts.

There are many threads that tie the following case studies together, but I will single out two positive concerns: the need to strengthen local capacities, and to create training programmes, and two negative concerns: to avoid creating transition housing wherever possible and to always avoid rebuilding vulnerability.

- Support the key role of disaster survivors in re-building their own dwellings.

These were early days in the development of 'owner-driven' approaches to housing generally and within reconstruction programmes. But these were the roots being laid down by many, including John F.C. Turner and Fred Cuny, that were to lead to the recent achievements in the earthquake reconstruction in Pakistan. In this massive operation, the vast majority of the 463,243 dwellings were rebuilt in safe construction in under three and a half years by their owners. Supporting this enterprise by the army of rural builders, were the financial, logistical and technical resources of the Government Reconstruction agency ERRA ,UN-HABITAT and the World Bank

- Support the training of local builders in safe building design and
- Avoid the waste of Stage 2 Transition Housing

In 1976 I met Fred Cuny when he got off the plane in Guatemala about a week after the earthquake. We participated in some exciting early meetings with the Oxfam Field Director, Reggie Norton as the initial builder training courses in safe construction were being devised. (see case studies C.4 and C.5)

The developmental approach, to sell building materials to families (only to give them corrugated iron roofing when families had no cash to buy) and to train them in safe building was regarded as totally bizarre by agency directors who were embarking on the delivery of tents as well as traditional contractor based approaches to reconstruction. Families used the corrugated iron sheet to improvise temporary accommodation. And then later they reused the roofing on their permanent dwelling, thus avoiding the waste of 'double reconstruction' by building an interim transition house.

By extending the life of emergency sheltering and rapidly embarking on reconstruction, as happened in Guatemala it is possible have a simple '1-3 ' reconstruction strategy. But if authorities adopt a '1-2-3' strategy of emergency sheltering, transition, permanent reconstruction these three stages can delay recovery and waste valuable resources on double reconstruction.

Tragically, in the late 1970s and early 1980s many of the local community leaders who participated in these rural training sessions were exiled or killed by the extreme right wing government armies, who saw these trained leaders as potential subversive elements to be liquidated.

- Avoid reconstructing vulnerability (or avoid 'Building Back Badly')

The El Asnam earthquake of 2000 (see case study C.2) provides a vivid reminder of the importance of the 'build back better' campaign initiated by Bill Clinton after the 2004 tsunami. As the case study describes, El Asnam was badly damaged in its 1980 earthquake, with over 3,000 killed and a total of 85 schools being destroyed.

What is particularly pertinent is the fact that Orleansville, (the name for El Asnam before Algeria became independent of France) had been devastated in an earthquake in 1954, just 26 years earlier. At that time the population was less than a third of the population it was to be in 1980. After the 1954 earthquake there was a rapid reconstruction programme where some shoddy construction took place during a veritable building boom. Many schools were built to poor standards, with totally inadequate seismic protection. Thus the root causes of the many of the collapsed schools of 1980 lay in the 'reconstruction of vulnerability' resulting from poor construction, a lack of effective building controls, unsafe designs and a lack of enforcement in the mid 1950s.

The case study C.2 serves as a graphic reminder of the necessity to look for the root causes of vulnerability, not just at the symptoms of unsafe conditions. In this case the root causes of the deaths and destruction were population growth, rapid urbanisation, negligent building industry and design profession, and inadequate building safety codes.

It is doubtful if any engineers or architects were prosecuted for the building failures in Algeria in 1980. However, following the Sichuan earthquake in China in 2008, where over 70,000 died, press reports state that a number of the engineers responsible for the inadequate structural design of the failed schools have been executed by the authorities.

Professor Nick Ambraseys' summing up of the building failures after the Guatemala earthquake (case studies C.4 and C.5) may be coming true thirty years later "today's 'Act of God' will be regarded as tomorrow's act of criminal negligence".

Finally, may the reading of these 23 case studies encourage the directors and staff managing current shelter and housing reconstruction programmes to carefully document their own actions and where possible the plus or minus consequences, and to widely disseminate such lessons.

These studies indicate a clear need to make sure that:

- lessons are learned and applied,
- wheels are not reinvented, and
- the seeds of new effective policies (such as user-driven housing pioneered in 1976) are sown and nurtured in fertile soils, to yield future benefits to society.

Ian Davis July 2010

Ian Davis is Senior Professor in Risk Management for Sustainable Development, Lund University, Sweden, and Visiting Professor in Cranfield, Oxford Brookes and Kyoto Universities

Collapsed school in El Asnam, Algeria, 1980. Act of God or Criminal Negligence? Photo: Giles Whitcombe

C.2 Algeria - 1980 - Earthquake

Case study: Emergency shelter

Case study credit: UNDRO 1982

Disaster:
Earthquake (Richter 7.3) El Asnam Algeria

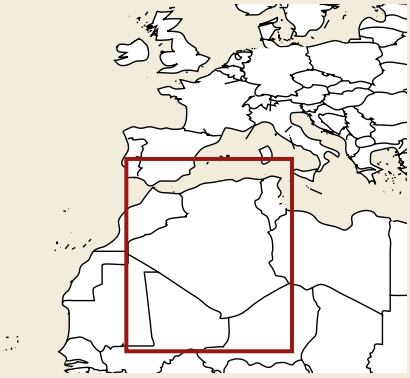
Disaster date:
10th October 1980

Number of houses damaged:
60,000

Number of people displaced:
400,000

Number of dwellings damaged or destroyed:
140,000

Value of assistance:
50 million USD for relief in December 1980



Project timeline

- 20,000 units of prefabricated temporary housing to be built
- 1 year – Tents, shelter material and camp sites provided and residents asked to occupy them for a year.
- 1 day – Inter-Ministerial Reconstruction Commission formed
- October 1980 – Earthquake

Emergency

One day after the earthquake, the Algerian President formed an Inter-Ministerial Reconstruction Commission. It was charged with three tasks (in order of priority):

1. save lives, prevent epidemic diseases, establish tent campsites
2. evaluate losses, protect property
3. prepare for reconstruction, noting the experiences of other earthquake-prone areas

Urgent attention was given to provide tents and shelter materials and campsites due to impending winter conditions. The affected population was asked by the government to occupy campsites for one year pending provision of temporary prefabricated housing. This promise was kept (El Asnam town).

Reconstruction

After some debate, the decision was made to retain existing site of El Asnam, but reconstruction was only allowed after a microzoning study.

Prefabricated “temporary” housing (pending reconstruction) was to be built in El Asnam town. The plan was for 20,000 units with expected 20-years occupancy.

Conventional, reinforced concrete housing was to be reconstructed to earthquake-resistant standards. Traditional housing would be reconstructed in rural areas.

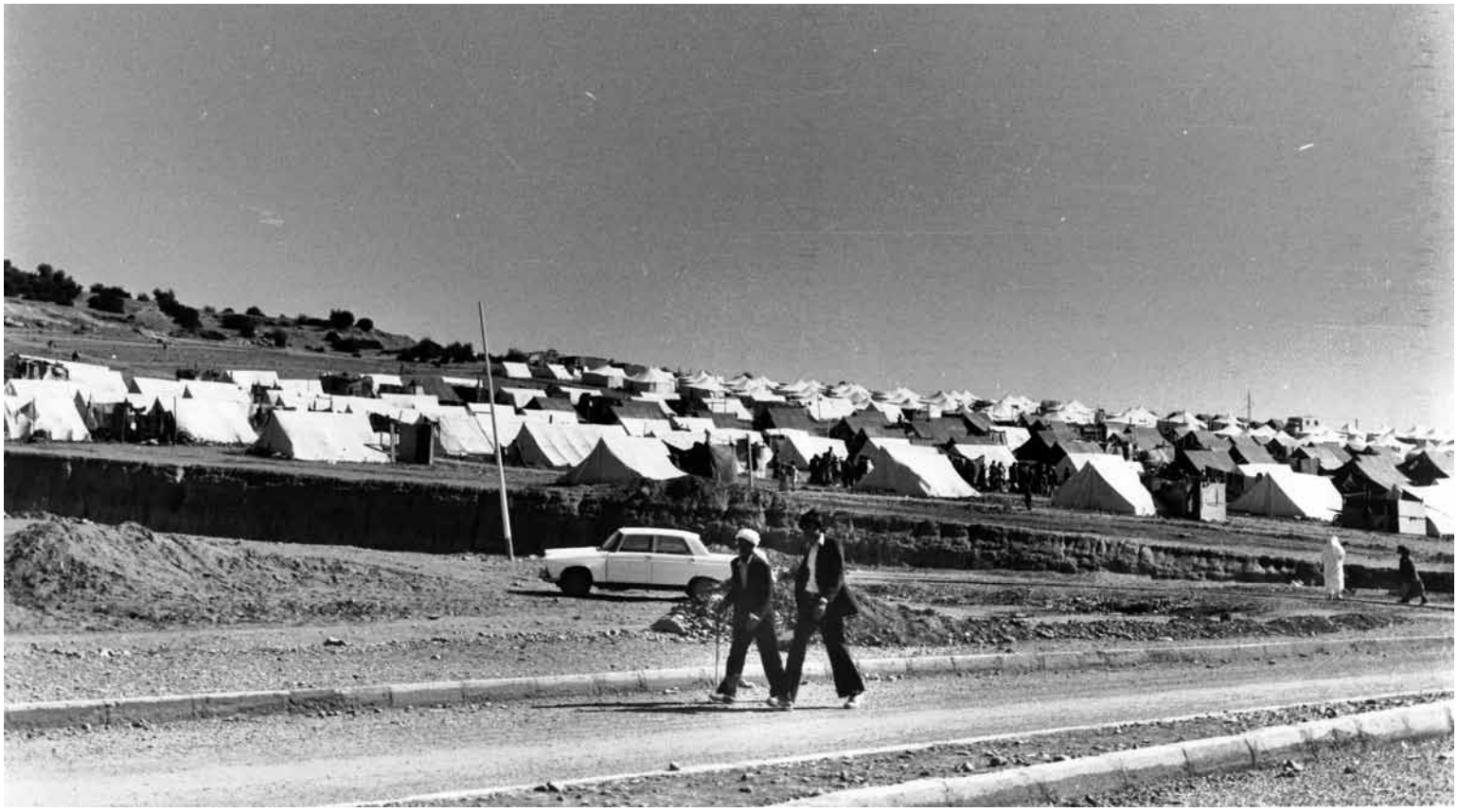
Strengths and weaknesses

✓ Tents and plastic sheeting served a useful function, particularly when freely adapted or located by the surviving families.

- As a consequence of recent rapid urbanisation, many unsafe modern, reinforced concrete structures had collapsed in the earthquake.
- The collapse of 85 schools indicated the priority need for seismic design and construction of public buildings.

× Overestimates of casualties and relief needs gave rise to some waste, with excessive provision of medical aid.

× Officials under-estimated the self-help capacity of survivors.



Top: a tent camp. Below: self built shelters in El Asnam. Tents and shelter material were distributed, and people were asked to live in camp sites for one year whilst prefabricated houses were built. Photos: Giles Whitcombe

C.3 Bangladesh - 1975 - Conflict displaced

Case study: Shelters and camp planning

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Project type:
Cyclone-resistant shelters in camps for the displaced.

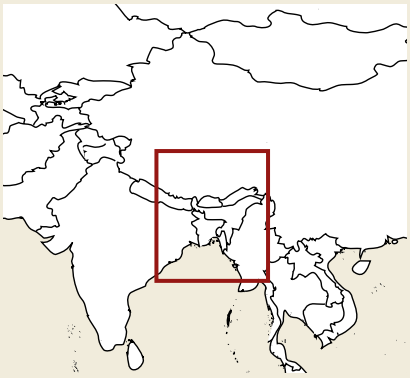
Disaster:
Bangladesh war of independence, 1971

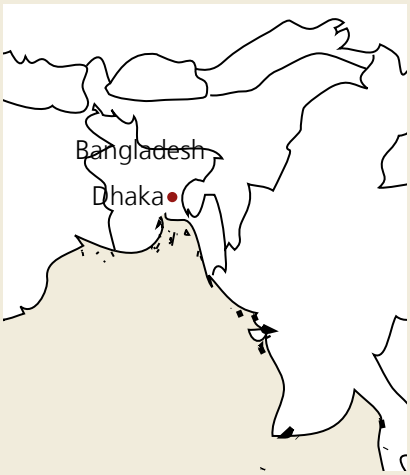
Number of people displaced:
Hundreds of thousands.

Project target population:
Three camps.

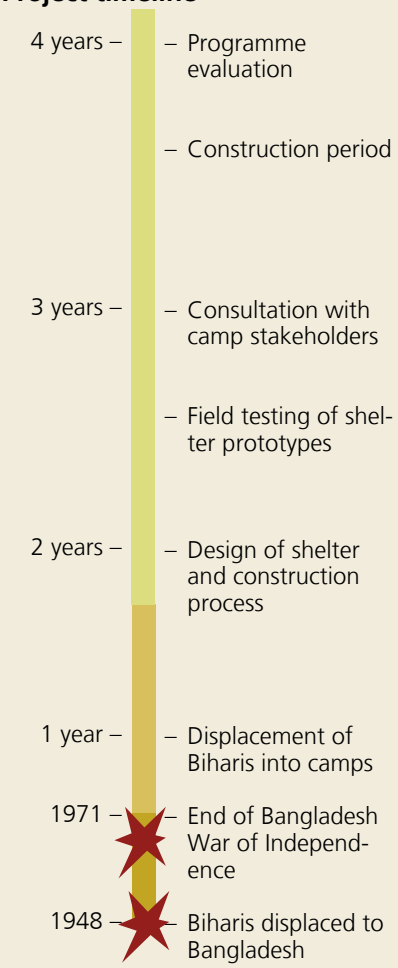
Occupancy rate on handover:
100%

Shelter size
Various





Project timeline



Summary
Long-term camps for displaced stateless populations were upgraded using cyclone-resistant shelter designs made from local materials, in order to re-organise and upgrade small camps along community-cluster designs.

Strengths and weaknesses

✓ Shelters made from local materials were successfully designed to withstand strong winds.
✓ Small clusters of shelters allowed for privacy and for community support.
✓ Reorganisation of camp layout gave more personal outdoor space to each family, and allowed for better drainage.
✓ Implementation was quick, due to use of locally available materials.
× A-frame design was structurally sound but reduced indoor space, and made extension of shelter difficult.
× Lack of involvement of target population in design process resulted in lower levels of beneficiary satisfaction post-occupancy

C.4 Guatamala - 1976 - Earthquake

Case study: Shelter construction

Case study credit:
UNDRO 1982

Disaster:
Guatamala earthquake

Disaster date:
Feburary 1976

Number of houses damaged or destroyed:
384,762,
(Guatemala City 221,261)
(Rural areas 163,501)

No. of people displaced:
1.6 million

Value of damage:
750 million USD estimated

Funding - external sources:
7.5 million USD for relief, and 17.5 million USD for reconstruction.

Quote:

"A Committee of voluntary agencies writing to the President of Guatemala two years after the earthquake of the 4th February, 1976, admitted that many mistakes had been made and listed the following five as the most important: too much aid was given away; too many of the houses constructed were merely of an emergency type; some organizations used large numbers of foreign volunteers; too much was done under pressure and without proper consultation, so that the victims became mere spectators of the work carried out rather than participants; a lot of reconstruction work was undertaken without first consulting the Government's Reconstruction Committee"
-R. Norton.

Emergency

No clear policy on shelter emerged in the initial weeks following the earthquake. The Reconstruction Commission allocated towns and villages to the very large number of relief agencies.

The Government planned to build 100,000 temporary houses with military support, but there was little follow-up. Many agencies adopted a policy of providing corrugated iron sheeting (lamina) which could serve as emergency shelter, and subsequently as permanent lightweight roofing. These programmes developed from week I onwards.

Reconstruction

There was no clear reconstruction policy. This was left to individual municipalities to determine, in consultation with assisting groups.

Reconstruction in Guatemala City was made more complicated by land tenure problems, which delayed all urban reconstruction.

Strengths and weaknesses

✓ The widespread improvisation of shelter in Guatemala City underlined the resourcefulness of survivors.

✓ The Oxfam World Neighbours Housing Education Programme was a major innovation in post-disaster housing programmes, with its emphasis on accountability and training in low-cost, anti-seismic construction.

✖ Too much aid was given away; too many of the houses constructed were merely of an emergency type; some organizations used large numbers of foreign volunteers; too much was done under pressure and without proper consultation, so that the victims became mere spectators of the work carried out rather than participants.

- Problems of land use were a fundamental issue in Guatemala City, since the majority of earthquake deaths related to unsafe siting as much as to precarious building.

Families salvaging materials and beginning reconstruction 5 days after the earthquake
Photos: Ian Davis

Left: improvised huts in the streets of Guatemala. Left: tents and shelters build from sheets. Survivors were quick to build their own shelters, whilst aid often ignored them, making the survivors spectators of the work carried out rather than the participants.
Photos: Ian Davis

An improvised shelter on a truck four days after the earthquake. In this photo it is being demolished so that the materials can be re-used.
Photo: Ian Davis

C.5 Guatamala - 1976 - Earthquake

Case study: Materials and training

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Disaster:
Guatamala earthquake

Disaster date:
Feburary 1976

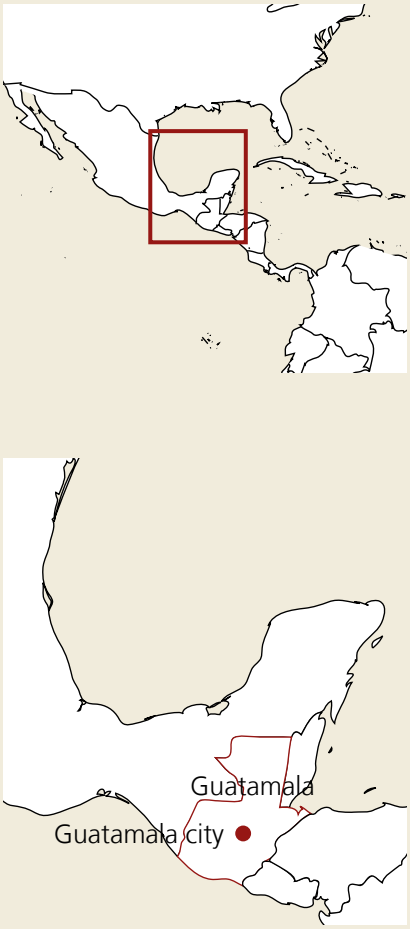
Number of houses damaged or destroyed:
384,762
221,261 in Guatemala City
163,501 in Rural areas

Number of people displaced:
1.6 million

Project target population:
15,000 families, in four rural districts

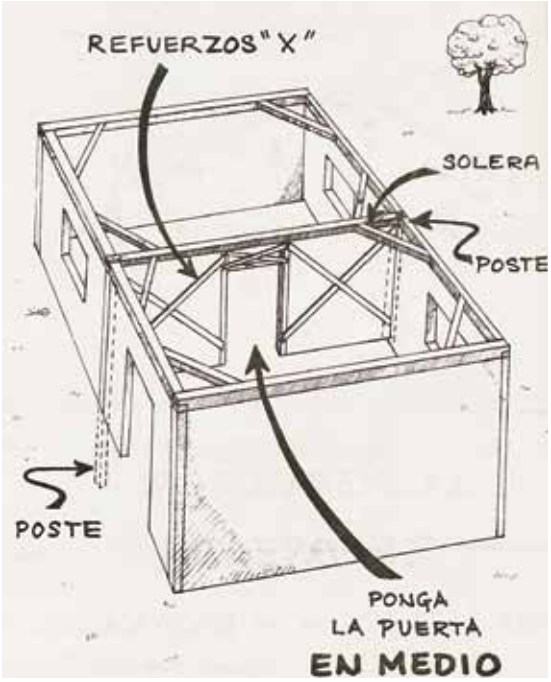
Occupancy rate on handover:
"Very low" for initial tents;
"Very high" for shelters constructed from distributed materials

Shelter size
Various



Summary
Housing materials were distributed, and training and advice provided through locally-hired teams. The aim of this was to accelerate reconstruction, and provide community-wide training on seismic-resistant construction techniques.

Earthquake resistant training in guatemala.
Photo: Oxfam GB



Sketch showing earthquake-resistant bracing
Image credit: Cuny Center

C.6 Haiti - 1982 - Shelter report

Case study: Report on shelter capacity

Country:
Haiti

Disaster:
Hurricane Allen

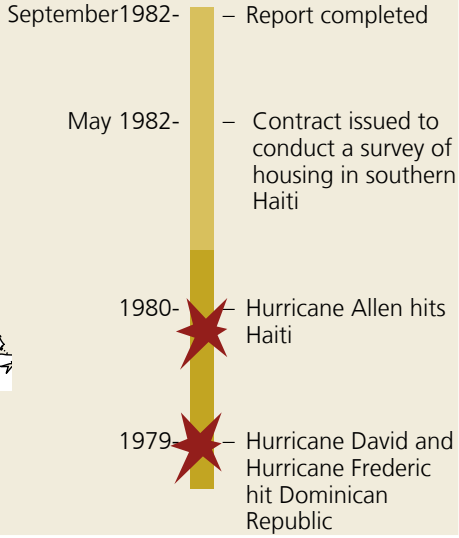
Disaster date:
1980

Number of houses damaged:
Relatively limited damage

Occupancy rate on handover:
No shelters were built or repaired in this programme. Concerns were raised about limited preparedness for future disasters in Haiti.

Shelter size:
Various

Project timeline



Summary
This report was written by Fred Cuny / Intertect in 1982. It summarises the different types of housing in southern Haiti. It goes on to suggest low-cost improvements that can be made to the houses in southern Haiti. Although the suggested housing upgrade programmes were not implemented, the suggestions remain relevant today. Illustrations from the document were copied for public information literature following the 2010 Haiti earthquake.

Report highlights

- Identified some simple messages for safer construction. Some of these have been copied and re-used following the Haiti Earthquake in 2010.
- Highlighted the impacts of deforestation on housing lifetime, strength and affordability.
- Outlined the threats to housing (wind damage, tidal surge, flooding, landslide fire and earthquake). It suggested hazard zoning to prioritise sites for intervention
- Classified rural housing types and suggested simple improvements and retrofitting that was possible for each type of housing.
- Identified some key messages for those constructing houses to improve the safety and quality (e.g. house shape and location, hurricane strapping, small eaves).
- Outlined programme approaches to improve housing quality, as well as looking at the capacities of various organisations to implement them. The approach suggested was:
  - Identify implementing organisations and a coordinator.
  - Develop strategies to reduce the cost of housing improvements through the involvement of local cooperatives (where families work together to construct their houses). This would increase financial assistance (through mechanisms such as subsidised and soft loans) and would reduce materials and tool costs through subsidies or establishment of local manufacture.
  - Establish a training programme for builders.
  - Develop public awareness about the need to improve housing and how it can reduce household costs.

Housing patterns in southern Haiti
Illustrations: A. James Viet. and Juliana Marek

The report analysed risks to buildings and which projects could best reduce them.

Context

Between 1950 and 1982, eight hurricanes and numerous tropical storms hit Haiti. In August 1980, hurricane Allen passed the coast of Haiti, killing at least 200 people, and causing significant but localised damage.

Two years later, concerned by the potential for a large scale disaster in Haiti, Oxfam contracted Intertect, an American firm specialising in housing reconstruction and disaster preparedness, to write a study on hurricane risk to housing in Haiti. This was presented to the Haitian Disaster Preparedness Committee, which had representatives of the Red Cross, Catholic Relief Services (CRS), Caritas and CARE).

In 1982 Haiti was already suffering considerably from deforestation. There had been limited reforestation projects, although there were some questions asked about the appropriateness of the species of tree being used. The species planted were fast growing to promote soil stability and work as fuel sources, but were generally not good for construction.

Risk of strong winds can be increased by topology

Risk of storm surge.

Risks in Haiti

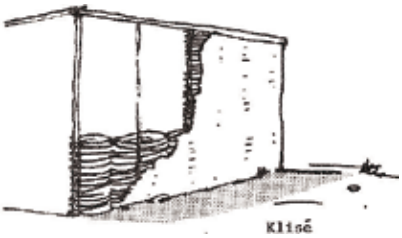
The report discussed the following threats to housing, which remain the major concerns in Haiti today:

- Hurricanes and tropical storms threaten housing in four ways:
  - High winds can lead to damage or collapse
  - Storm surges (known as tidal waves) flood low-lying coastal areas
  - Rain fall during the storm can cause flooding or can cause land slides, mudslides or other land displacements.
- Earthquakes
  - The most susceptible houses are heavy, low-quality masonry buildings. These were exactly the types found in the south.
- Fires
  - The risk was highest in urban areas, and dense squatter settlements with inadequate cooking facilities and no electric lighting. It was noted that one recent fire in Port-au-Prince had left thousands homeless.
- Termites and other insects
  - can weaken timbers

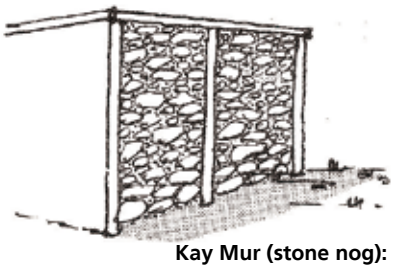
Housing typologies

Materials commonly used in rural housing:

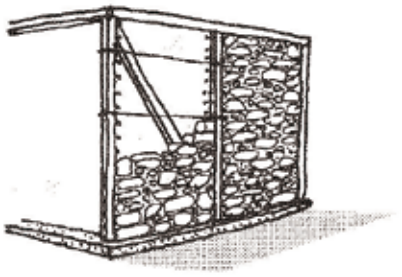
Kay Ajoupa (wattle or reed houses). Wood pole frame with woven cane or sticks as walling. Lived in by the poorest Haitians.



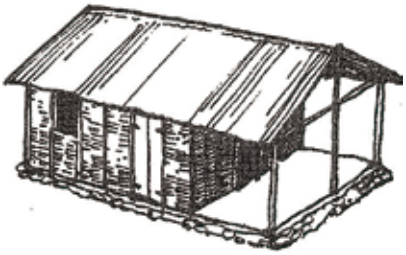
Kay Klise (wattle and daub house): Wood pole frame with woven cane or sticks and mud render as walling



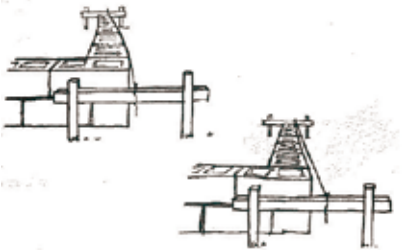
Kay Mur (stone nog): Small stones are cemented between a wooden frame. This was the most popular type of housing found in the south of Haiti.



Kay Melange (spanish wall): Similar to Kay Mur, (above) but stones are smaller and a board is used as a guide during construction. Illustrated here with a suggested improvement of cross bracing



Kay an Planch (wood house): Wooden houses made of locally available timber or wood salvaged from urban construction sites. Deforestation had made wood scarce, so more houses were using palm wood.



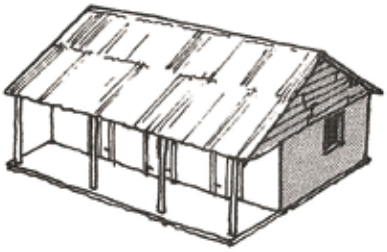
Kay an Bloc (block house) Houses made of cement block. These suffered from poor quality blocks and mortar as well as poor quality construction

The document noted that wooden houses tend to be more heavily damaged by hurricanes than other types of construction. Many of them, including those built by development agencies were poorly anchored to the ground

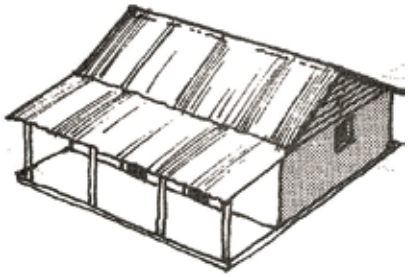
Housing layouts

Different configurations of roofing and veranda lead to differing strengths of shelter. The designs with highest risk are where the veranda allows wind to get underneath, damaging the entire roof.

Safer designs are those where the veranda roofing sheets are separate to the main roof–damage to the veranda will not affect the main roof.



The arrangement below is preferable to the one above. If the verandah (above) was damaged by hurricanes the entire roof would be compromised, whilst in the verandah below damage to the verandah would not affect the rest of the roof



Technical proposals

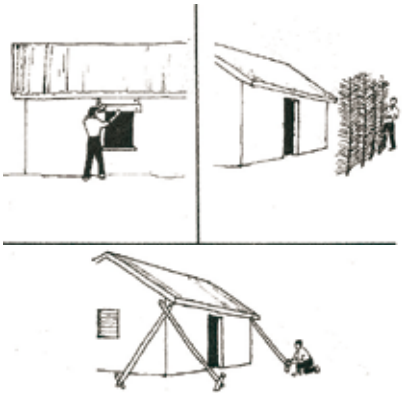
The vast majority of existing buildings, could not be economically retrofitted or modified at a cost anywhere near affordable to homeowners. The report focussed on emergency measures to make buildings safer, even though they would be unlikely to survive windstorms.

Emergency repairs

Specific recommendations for different types of housing were made. In general, the recommendations (for buildings with timber structures) are as follows.

- Increase the number of nails to fasten the roof.
- Add diagonal bracing to the framing.
- Strengthen connections between the roof and the wall by using metal straps or wire
- Board-up windows when a hurricane approaches
- Place heavy objects on the roof to reduce suction.
- Seal areas below houses on blocks or piers with stones and mud to prevent air from entering underneath houses and lifting them off their foundations.
- Seal openings between roof and walls to prevent wind from entering the eaves.

Hurricane preparedness: blocking gaps in the eaves and under shelters, securing walling and roofing sheets



Hurricane preparedness: shuttering windows, building protective screens in front of openings and bracing corners of buildings

For new-build

Use timber treatments for timbers in contact with the ground

- Bury primary columns a minimum of 24 inches (60cm)
- Cross-brace the structure with galvanised wire or timber (depending on the building type).
- Use diagonal bracing in roof structures.
- Place diagonal braces on top of frames in each corner.
- Use hipped roofs.
- Design verandas to use separate sheets from the rest of the roof.

Programme proposals

The report noted that extreme poverty in Haiti meant that for many families, housing was a low priority. Most families recognised that their houses would not survive a hurricane, but did not have the means to improve them and had not prioritised housing upgrade. In order to improve housing, cost reduction strategies should be implemented. These could include:

- cooperative activities – to share the workloads and imputs of skilled workers
- increasing financial assistance to improve houses; this could include loan guarantees, subsidised loans, soft loans and revolving loans
- reducing costs of materials through payment of subsidies, collective purchases, local manufacture, material trade-ins and support with transport costs

It also encouraged training prioritising young people, those moving to towns, and families participating in rural development programmes. It also promoted contractor training to improve construction quality. These various types of training would include:

- Theoretical training
- Hands-on practical training
- Construction of model houses
- Follow-on practice with supervision to ensure that new skills are learnt

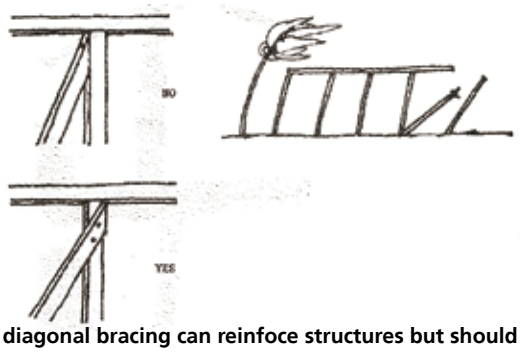
Risks of doing nothing

The report warned that without housing improvement activities and corresponding changes in reforestation policies:

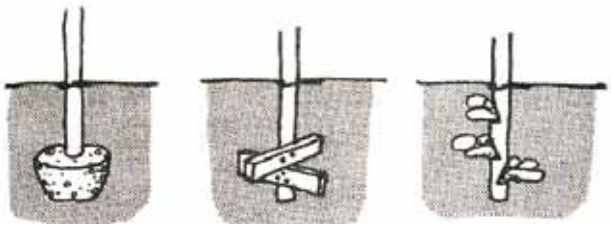
- housing would continue to deteriorate
- the number of people in vulnerable buildings would increase. As a result there would be a greater loss of life in future disasters
- houses would have a shorter lifetime and will need to be replaced more frequently
- low income families would need to increase the proportion of their income spent on housing repair and maintenance.

Risk of roof damage

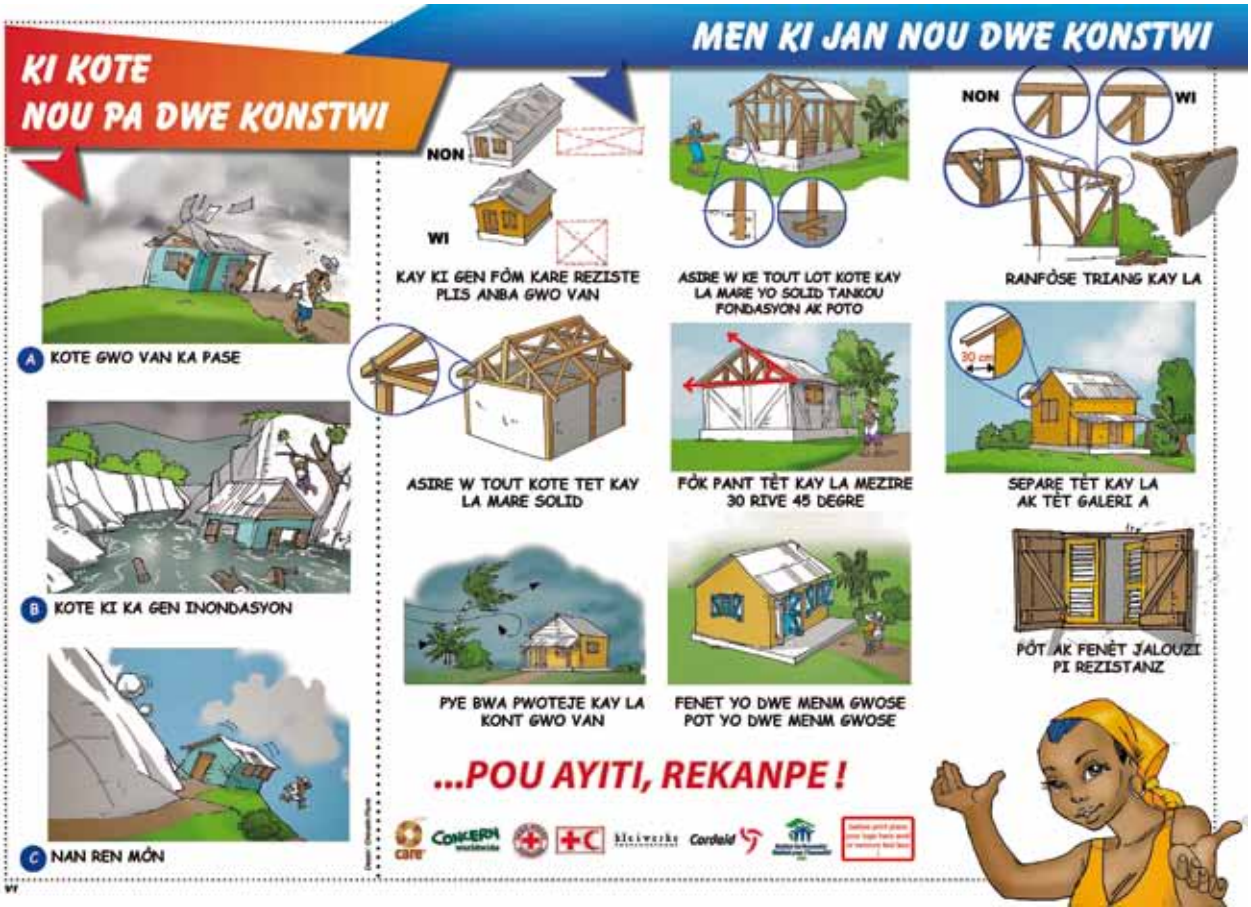
Trees can help protect houses from wind damage



diagonal bracing can reinfoce structures but should be correctly attached



Different foundation details



Top: illustrations by: A. James Viet. and Juliana Marek from the 1982 report
Bottom: Shelter cluster technical guidance following the 2010 earthquake in Haiti. There are many similarities between the two sets of drawings.

C.7 Honduras - 1998 - Hurricane Mitch

Case study: Transitional shelter

See Shelter Projects 2008 for more

Project type:
Transitional shelter construction

Disaster:
Hurricane Mitch, 1998

Number of houses damaged:
Across Honduras, the storm destroyed 33,000 houses and damaged 50,000 others

Project target population:
3,000 families or 15,000 beneficiaries

Occupancy rate on handover:
Very high.

Shelter size
11.1 m^2
(The shelter was targeted at a family of four to five members,
two adults and up to three children;
Larger families were offered more than one shelter).

Project timeline

Summary
The program provided materials and technical assistance for construction of a 3.05m x 3.65m wooden framed shelter in central and southern Honduras for victims of hurricane Mitch. The roof was made of galvanized roof sheets that were reused when the families re-built their houses with more durable materials. Sides were made of reinforced good quality woven plastic sheeting. The shelter included a door and two windows with nets to provide both privacy and ventilation.

Although the preferred option was to build shelters on people's own land, in some cases it was necessary to build shelters on a temporary relocation site.
Photo: Milton Funes

C.8 Honduras - 1974 - Hurricane

Case study: Shelter construction

Case study credit: UNDRO 1982

Project type:
Camps
Materials distribution
House construction

Disaster:
Hurricane "Fifi"

Disaster date:
18-20 September 1974

Number of houses damaged or destroyed:
27,000

Number of people displaced:
Upto 350,000

Value of damage:
Approximately 500 million USD.

Value of assistance:
11.6 million USD from external sources

Project timeline

26 Sept – Meeting of agencies; Each was asked to indicate in which area of relief it wished to work

20 Sept – Arrival of first supplies for emergency shelter; requests changed due to continuing surveys

19 Sept – Damage assessment teams requested from UNDRO and US Government

– Honduras Red Cross dealt with immediate needs

September 1974 – Hurricane FiFi

Emergency

Eight large refugee camps were established. The largest was built in Choloma to house 318 families (1,831 people). In addition there were improvised shelters. The extended family system does not appear to have functioned effectively. Existing buildings, such as schools, were used as temporary shelter.

Reconstruction

There were the major programmes of house building, each lead by a voluntary agency. In addition, CARE distributed roofing materials for 5,324 houses; housing was built above the flood plain, on the hillside, but remained vulnerable in many instances, due to poor 'cut and fill' techniques. A wide variety of systems including prefabricated timber and precast concrete systems were used for housing construction.

Strengths and weaknesses

× There was a marked absence of governmental provision of new housing.
× There was marked lack of local involvement in the camp and in rehousing programmes, many of which were culturally unsuited to local conditions
× The distribution of aid was concentrated in certain centres such as Choloma, which caused a spiral of dependency with adverse long-term consequences.
× Many of the housing systems were not easily modified or maintained by those living in them.
× New buildings were not designed or sited to resist future high winds or flood action adequately.
- One of the new housing settlements, 'Colonia Canada', in Cholorna is interesting in that it evolved from a refugee camp of 485 families to a permanent settlement of 381 houses.

C.9 India - 1977 - Tropical cyclone

Case study: Materials and training

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Project type:
Distribution of building materials
Training support

Disaster:
Tropical cyclone (winds up to 270 km/hr), Andhra Pradesh, India

Disaster date:
28 October - 1 November 1977

Population left homeless by disaster:
3.4 million people total, 20,000 in the administrative area where the NGO was working. "Virtually 98%" in areas affected by tidal wave.

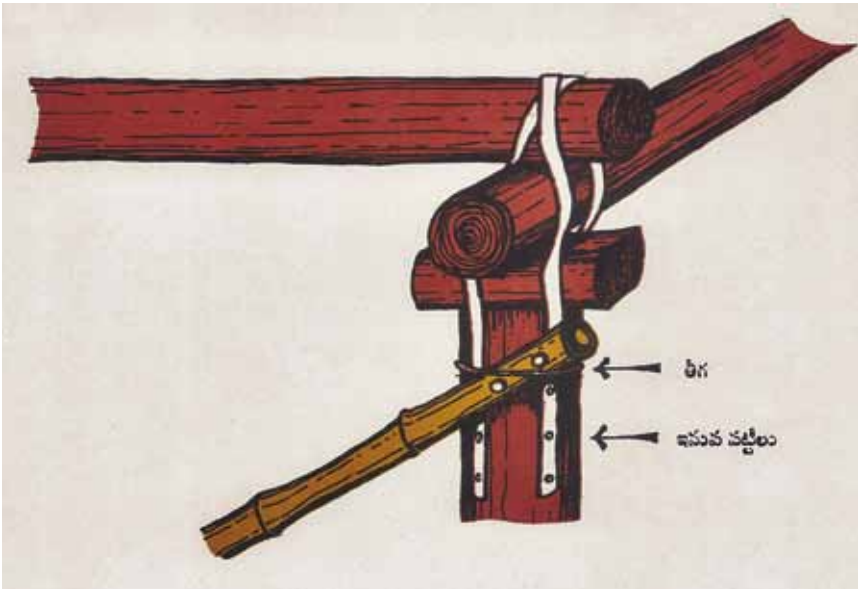
Project target population:
2,000 households

Occupancy rate on handover:
Not known
Constructed from distributed materials

Shelter size
25m²

Project timeline

Emergency:
Basic kits of local materials were distributed. These were supplemented by materials to strengthen the resistance of existing shelters to cyclones. A special centre was created by the organisations to support the distribution and to provide of technical training and information. The project was timed, and in some cases postponed, to ensure that labour was not diverted from agricultural tasks, and to ensure availability of appropriate materials.



Connection detail
Credit: Cuny Center

C.10 India - 1977 - Cyclone

Case study: Traditional or modern shelters

Case study credit: UNDRO 1982

Country:
India, Andhra Pradesh

Disaster:
Tropical cyclone (winds up to 270 km/hr)

Date:
28 October - 1 November 1977

Pre-disaster Population:
Unknown

Number of people made homeless:
250,000

Number of Dwellings Damaged and destroyed:
150,000 homes, probably 90 per cent of all houses in coastal area.

Values of damages:
Monetary value unknown, but considerable losses to crops, livestock and fishing equipment.

Value of assistance (US dollars):
Unknown

Project timeline

- 2 ½ years – 500 community cyclone shelters completed
- 2 years – 15,000 houses were built using timber, mud, thatch
- 10 weeks – Housing construction complete, to fit a US Government requirement of confining assistance to a 90-day, post impact period.
- One month – Housing construction started
- November 1979 – Cyclone

Emergency

The climate was warm and the monsoon season not imminent, so shelter needs were not a high priority,

The Government made stocks of thatch and bamboo readily available for families to improvise shelters, and repair or rebuild their homes.

An international non-governmental organisation, worked through Indian voluntary agencies to build 7,000 shelters in 90 days.

Reconstruction

The state government made certain promises to provide 'pukka' housing (houses built of built of substantial material such as stone, brick, cement, or concrete) for surviving families in lieu of providing support for traditionnal types of construction. The houses to cost about 6,500 Rupees with a plinth area of about 190ft^2 (17.5m^2).

1,300 community cyclone shelters were planned by the government. They additionally constructed environmental protection measures, such as tidal embankments, tree belts and other plantations.

Strengths and weaknesses

✓ The government adopted a Preparedness Plan which included 13,000 community cyclone shelters.

✓ Evidence suggested that the concrete block housing has had a positive effect in the local economy.

× Despite the minimal need for emergency shelter and pressing agricultural priorities, one agency devoted extensive resources (US Government aid) to build 7,000 shelters. This was mainly the work of contractors, generating limited local employment.

× Opportunities were missed to instigate training programmes in improved construction techniques, the only exceptions were the programmes organized by the Village Reconstruction Organization (VRO), and a local organization Appropriate Training and Information Center (Artie).

- The debate between supporters of "pukka" housing and those of traditional housing was ultimately won by the former, with the proposed building of 20,000 "pukka" houses. However in practice 15,000 traditional houses were actually built.

The government made stocks of thatch and bamboo available so that families to improvise shelters. Non-governmental organisations also built many thousands of these shelters.
Photos: Ian Davis

Housing by a reconstruction organisation built in 1969 following the cyclone, with lean to in the foreground. In the village many of the families evacuated most of the concrete block housing to live in improvised thatch lean-tos which are climatically more suitable.
Photo: Ian Davis

Details of a model home built out of bamboo and thatch to explain a safer techniques in cyclone resistant housing. It had key elements of: a well-anchored central post, triangulation to stiffen the frame, good connections of roof to wall using metal connections
Photos: Ian Davis

C.11 India - 1971 - Conflict refugees

Case study: Camp planning guidelines

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Disaster:
Civil War in Bangladesh (then, East Pakistan). People were displaced into West Bengal

Disaster date:
Start 26th March 1971

Project type:
Distribution of building materials with training support

People displaced by disaster:
10,000,000

Project target population:
7 camps, each of between 15,000 and 20,000 people, with one camp designed to be extendable for up to 300,000 people

Occupancy rate on handover:
100%

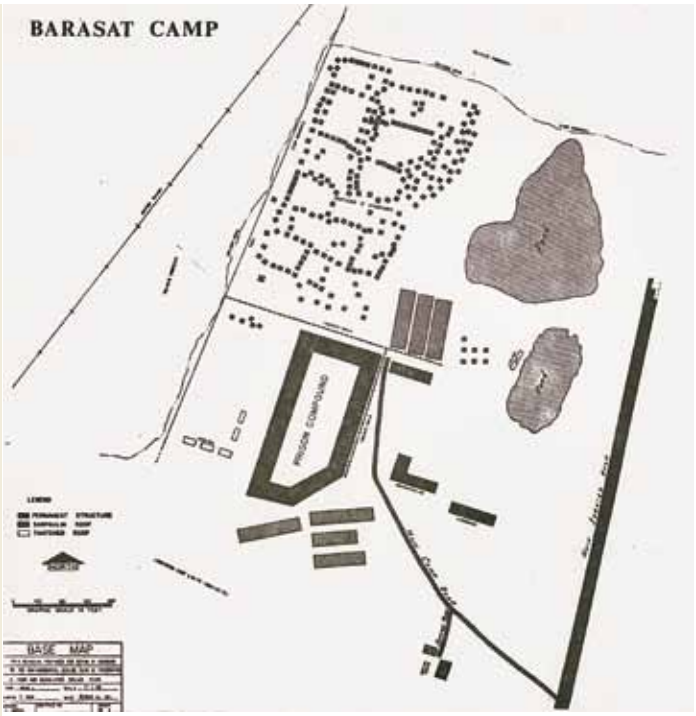
Shelter size
Various

Project timeline

Summary:

The project worked directly on the implementation of various projects in the camps. These included setting up materials workshops to drainage excavation, and also implemented camp layout strategies, from which a set of guidelines of basic camp planning principles was written later that year.

Refugee camps were designed in decentralised 'village' groupings. Construction and upgrading was undertaken in three phases: first, meeting basic needs, second, sustainable upgrading and third maintenance of the camps. Emphasis was given first to sanitation and public health issues, and then to the emotional and social well-being of the inhabitants. From the lessons learned in this response, the first ever humanitarian camp planning guidelines were developed.



Clustered camp plan
Image source: Cuny Center

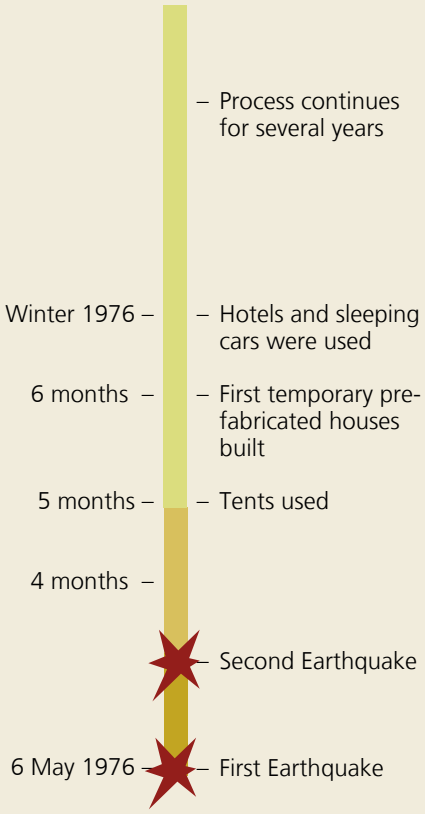
C.12 Italy - 1976 - Earthquake

Case study: Shelter construction

Case study credit: UNDRO 1982

Disaster:
Earthquake Friuli, Italy
Disaster date:
6 May 1976
15 September 1976
Number of houses damaged or destroyed:
30,527
No. of people displaced:
45,000
Occupancy:
Campsites with tents - very low;
individually distributed tents - very low;
mobile homes - 100%;
150 railway sleeping cars - very high;
20,000 hotel rooms - 100%;
25,000 prefabricated houses - very high.
Value of damage:
Estimated 1.1 billion USD

Project timeline



Emergency

Municipalities were responsible for providing temporary accommodation (of the type indicated above) for their affected citizens. Workers commuted between their temporary accommodation and the affected villages.

Tents were used from May to October 1976. Hotels and sleeping cars were used in winter. The first temporary prefabricated houses were built by the winter of 1976, but the process continued for a number of years.

Reconstruction

Pending the rebuilding of houses to their original form, temporary prefabricated houses were provided on specially prepared and serviced sites. All reconstruction was to be to earthquake-resistant standards. This policy of building twice, was designed to prevent migration away towards the large industrial centres of the works, by providing both short term and long term incentive to stay.

Strengths and weaknesses

✓ The extensive use of mobile homes and hotels (in winter) was most successful, in contrast to low occupancy of tent campsites.

✓ Responsability was decentralised to the local authorities. This increased the accountability of officials to the disaster victims, even though there were unequal performances between some municipalities.

× The temporary housing policy, pending permanent reconstruction, proved to double the costs of reconstruction due to the price of prefabricated units and the investments needed to provide sites and services. This policy in effect retarded reconstruction.

- To some extent, pressure from the media and politics led to the temporary housing policy..

Tents were used until winter, after that hotels, and trains were used. Afterwards prefabricated houses were built. Photo: Ian Davis

C.13 Nicaragua - 1972 - Earthquake

Case study: Planned camp

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Disaster:
7.5 magnitude earthquake Managua, Nicaragua

Disaster date:
23 December 1972

Project type:
Shelters in community-grouped camp in Coyotepe, Masaya

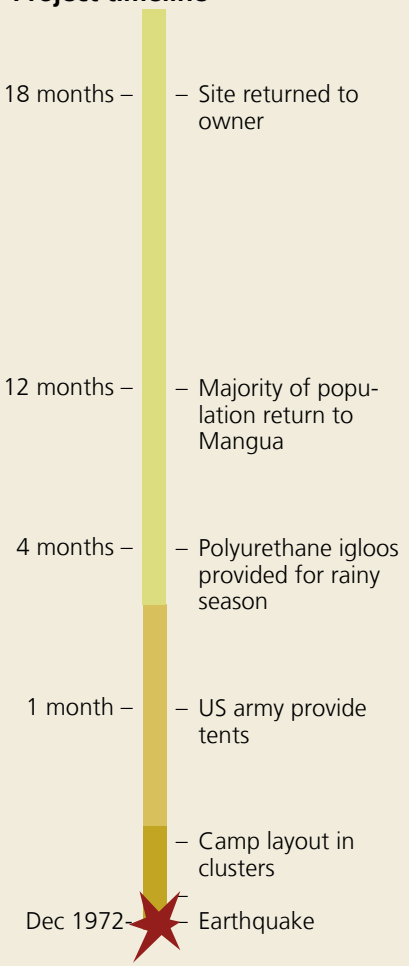
Houses damaged:
50,000 destroyed, 24,000 damaged

Project target population:
180 then 360 families in tents; afterwards 310 families in polyurethane igloos

Occupancy rate:
60% of tents, 45% of replacement igloos occupied on handover

Shelter size
Tent: approximately 12m²
Igloo: approximately 20m²

Project timeline



Summary

Working Working with displaced families, the NGO created a camp layout in Masaya which for the first time grouped families into group clusters, and supported community networks. All other camps previously were laid out along strict military lines. This new formation resulted in a camp with a much higher occupancy rate than any other camp built in response to the disaster, and at much lower costs.

The camp was laid out using square 'clusters' of 16 shelters, with a central space for administrative buildings and social or recreation areas. The clusters were placed so that the camp could be expanded after the initial construction phase. This would allow the camp to have capacity for up to 3,500 people (700 shelters). The layout was designed to accommodate either community or individual cooking and washing facilities. The latrines were placed outside of all of the shelter clusters along the side of the camp.

The design also took into account the possibility that the camp would exist for the longer-term, or would be upgraded into a permanent settlement. Space was provided for the installation of standard drainage, and semi-permanent water and sewage facilities.

Planned camp for earthquake affectees
Photo: Ian Davis

C.14 Nicaragua - 1972 - Earthquake

Case study: Overview

Case study credit: UNDRO 1982

Disaster:
7.5 magnitude earthquake Managua, Nicaragua

Disaster date:
23 December 1972

Population pre-disaster:
500,000

Number of houses damaged:
50,000

Number of people displaced:
200,000
Note. Of the homeless, 90 per cent were listed as lodging with relatives/ friends, and a small proportion were occupying improvised shelter.

Value of damage:
Approximately 800 million USD.

Value of assistance:
226 million USD between 1975 and 1978.

Project timeline

Emergency

The government policy was to evacuate Managua city centre. The reasons given were the risks of looting and epidemics. The government provided campsites, in Masaya and outskirts of Managua, and assisted in building wooden huts for 11,600 families. Initially, survivors tended to ignore government action, preferring to stay with friends and relatives.

Reconstruction

Prior to the Popular Revolution, Government policy was to cordon off the city centre, pending reconstruction using new seismic-resistant building codes. Reconstruction was placed under a special ministry. By freezing construction in the central area, vast suburban sprawl was encouraged, increasing costs of infrastructure development and maintenance, and altering the socio-economic base of the affected population. Housing reconstruction was entirely carried out by the private sector. The reconstruction policy was dictated by the interests of a small but wealthy land-owning class under the former regime.

Strengths and weaknesses

✓ The extended family system was a highly effective 'sponge', absorbing the homeless. This may have been due in part to rapid urbanization in the previous decade which created extensive rural-urban ties.

✓ The private sector played a key role in reconstruction, particularly on the periphery of the city.

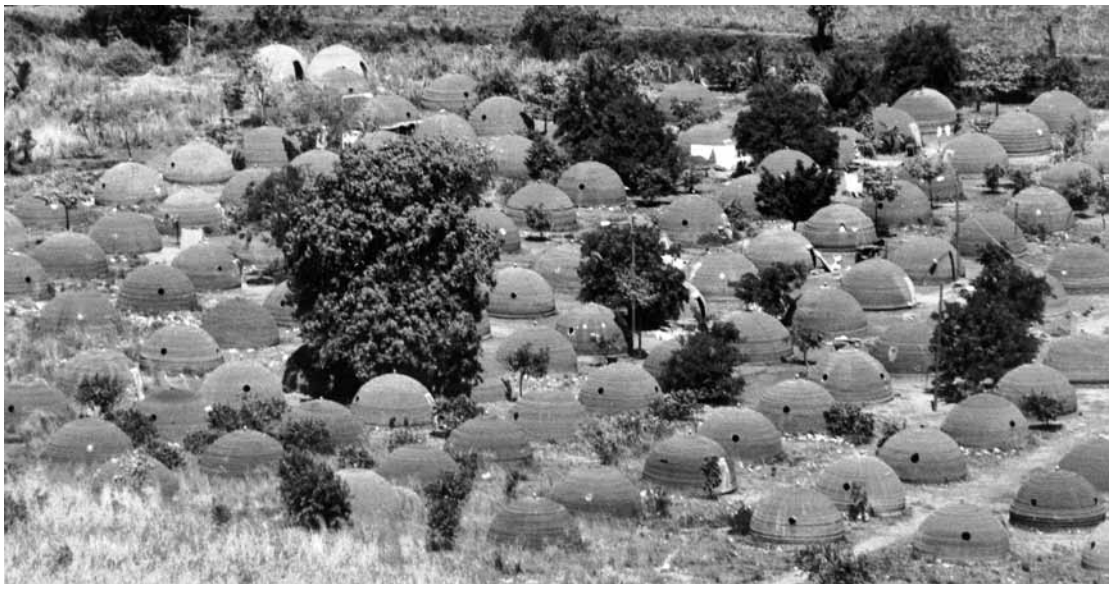
× The evacuation policy was the basic cause of the waste land that remained undeveloped in the centre of Managua until the 1979 revolution. If families had been allowed to remain within the earthquake ruins, it is probable that rebuilding would have proceeded rapidly. Thus, the obvious benefits of anti-seismic planning and building construction have to be set against the cost and social disruption of such measures.

× A consequence of the restriction of development in the urban centre has stimulated suburban decentralization, which radically changed the form of post-earthquake Managua.

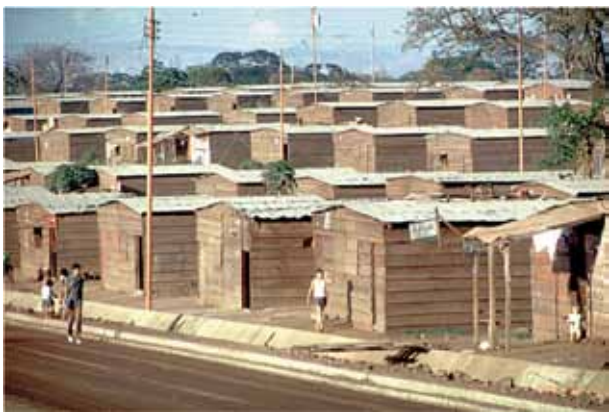
× Polyurethane igloos arrived too late to satisfy emergency shelter needs.

× The USAID wooden huts were ineffective as emergency provisions; they were remotely sited, and inadequate attention was paid to infrastructure.

The earthquake left large volumes of rubble to deal with
Photo: Ian Davis



Above and Centre: polyurethane igloos arrived too late to satisfy emergency shelter needs. Similar shelters were also deployed in Turkey (Gedez, 1970 and Lice 1975) and Peru (1970). they were finally abandoned as a system following the experiences in Lice (1975)
Photo: Ian Davis



The US Government donated money to build a total of 11,635 wooden huts as temporary houses for earthquake victims. The first units were completed 14 weeks after the earthquake. They were ineffective: remotely sited, andpaid insufficient attention to infrastructure: water supply, sanitation or road access.
Photo: Ian Davis

C.15 Peru - 1970 - Earthquake

Case study: Shelter construction

Case study credit: UNDRO 1982

Disaster:
7.9 magnitude earthquake Chimbote Peru

Disaster date:
31 May 1970

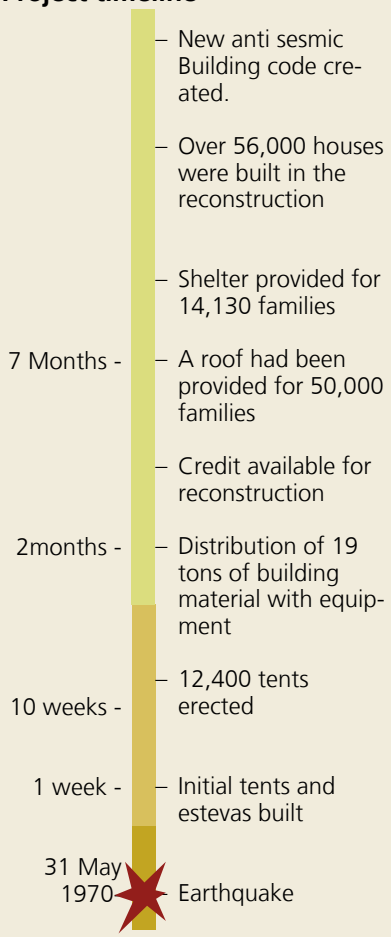
Population pre-disaster:
2,550,000

Number of houses damaged:
198,800
Urban:83,500
Rural:115,300

Number of people displaced:
500,000

Value of assistance:
44 billion USD from all sources, for relief and reconstruction.

Project timeline



Emergency

The Housing Ministry established an emergency shelter committee to assess the damage, to provide temporary shelter and re-establish essential water, sanitation and other services. 12,400 tents were distributed along with 19 tons of building materials and 602 tons of building equipment and tools. Over 50,000 families received corrugated iron sheets for emergency shelter. Emergency camps were established by the Government, broken down into family units in a project called Operation Roof. These emergency shelters were formed from metal frames, with corrugated iron sheet roofing; 80% of the materials were re-used in permanent reconstruction.

Reconstruction

A government reconstruction commission was established. This commission was to link reconstruction with general development programmes (including industrial and agricultural projects). It also had the responsibility of establishing new seismic codes for all buildings. It did not to permit the repair of damaged adobe buildings, but encouraged the re-use of emergency shelter materials in reconstruction. Over 56,000 houses were built in the reconstruction. These were built by the government (10,600 houses), through loans (3180 houses), by other sources (2400 houses), and through roofing schemes (40,000)

Strengths and weaknesses

✓ Reclaimed corrugated iron sheets, and the woven timber and straw of the huts served a useful function, being re-used in permanent reconstruction.

✓ The Bayer/Red Cross polyurethane igloos were generally well received; 50 per cent were still in use six years after the earthquake, but had been modified through additions and alterations.

× The decision to halt all reconstruction activity in Huaraz until seismic micro-zoning studies and the master plan were completed seriously retarded the reconstruction process.

× The 16,180 conventional houses built were only accessible to middle class families.

- The government decision to relocate some towns, due to risks of further mud slides was logical but highly unpopular with those affected.

C.16 Sudan - 1985 - Conflict

Case study: Planned camps

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Disaster:
Civil war and famine in Ethiopia (Eritrea and Tigray). People relocated to camps in Sudan

Disaster date:
1983-1984

Project type:
Planned camps

Population displaced by disaster:
Hundreds of thousands

Project target population:
232,000 across 15 camp complexes (June 1985), camp capacity designed for up to 640,000

Occupancy rate on handover:
Unknown

Shelter size
Various

Project timeline

- June 1985 – Voluntary repatriation of 55,000 people
- April 1985 – Death rates reduced to less than 5 per 1000 per day
- January 1985 – Death rates in camps rise to 15 per 1000 per day
- December 1984 – Measles reported in camps
- November 1984 – Large-scale migration starts
- September 1984 – First large influx of refugees from Tigrayuilt
- 1983 – Failure of harvest in Ethiopia
- 1970 – Years of flighting between Ethiopian gov. and Eritrea and Tigray

Emergency:
Refugees were relocated from smaller camps. This gave time to plan larger camps built as a second stage. These sites were better organised and had better facilities. By bulding camps with a hierarchy of shelter groupings (cluster-block-sector), it was easier for the humanitarian organisations manage the sites.

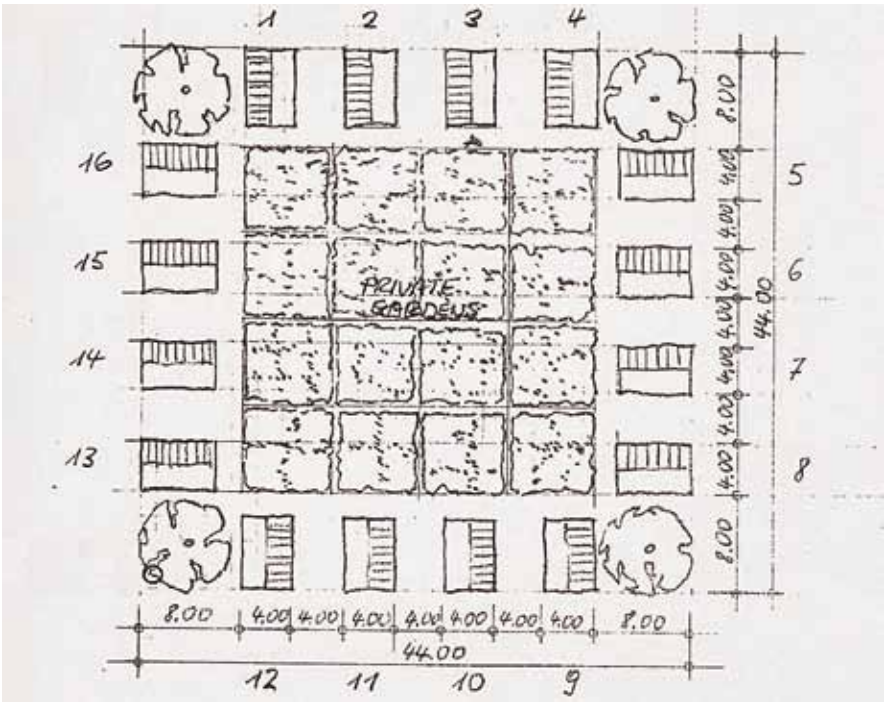


Illustration of a block plan for one of hte sites.
Cuny Center

C.17 Thailand - 1979 - Political conflict

Case study: Camp planning manual

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Project type:
Construction of two refugee camps
Development of a manual of standards

Disaster:
Invasion of Cambodia by Vietnam, December 1978

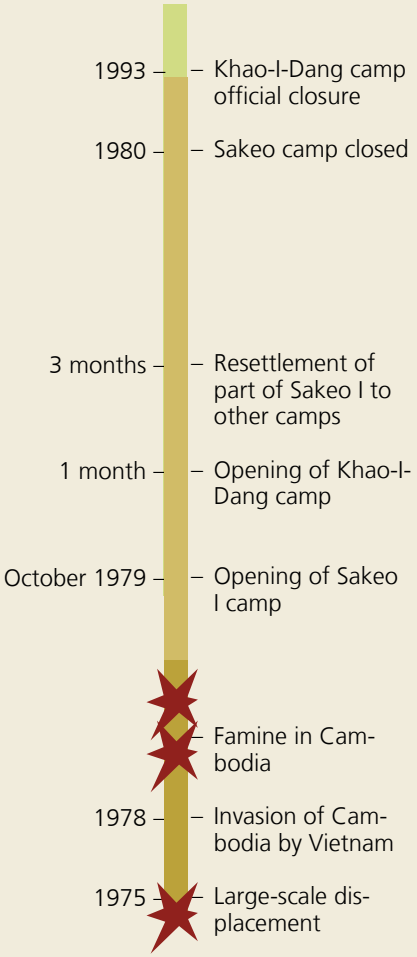
Population displaced:
One million crossed the border into Thailand at the height of the displacement.

Project target population:
Khao-I-Dang refugee camp population increased from 29,000 shortly after opening in December 1979, to 130,000 -160,000 in March 1980, to 42,000 by 1982.
Sakeo camp had 28,000 shortly after opening, then 17,000 when it closed in July 1980 (the remaining 17,000 were transferred to other camps).

Occupancy rate on handover:
100%

Shelter size:
16m² (but in multi-family units)

Project timeline



Summary
For the first time, clear numeric standards were introduced via the distribution, to each camp, of an operations policy and standards manual. This was to ensure equitable minimum services based primarily on public health and water and sanitation concerns. Two camps were planned according to these standards, using a decentralisation of services, and in later cases a checkerboard layout which provided internal space for some expansion.

Strengths and weaknesses

✓ Creating a written manual provided a clear checklist for the many organisations with limited prior shelter experience.

✓ Spaces for expansion within the present camp permitted some release of pressure from an increasing population.

✓ Advocacy of an incremental approach to shelter provision allowed for a response to continued influxes, and increasing camp populations.

✓ Innovations in water and sanitation latrine technology ('aquaprivies') permitted more flexibility in shelter layout design.

× Although multi-unit longhouses freed up more external space in extremely cramped sites, their use postponed rather than solved the problem of overcrowding, and at the expense of privacy and security.

× Lack of space and poor drainage contributed to health problems.

C.18 Tonga - 1982 - Cyclone

Case study: Community projects

Case study credit: CUNY Center
See Shelter Projects 2008 for more

Disaster:
Cyclone Isaac

Disaster date:
3rd March 1982

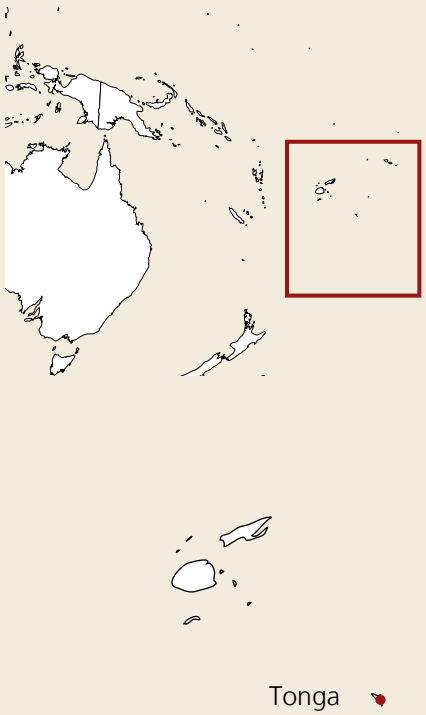
Project type:
A quick impact project;
Shelter disaster mitigation

Population displaced by disaster:
45,000

Project target population:
6,600 people in 34 villages for the small projects programme;
95,000 people (entire population) for disaster mitigation/preparedness programme

Occupancy rate on handover:
Unknown

Shelter size
Various

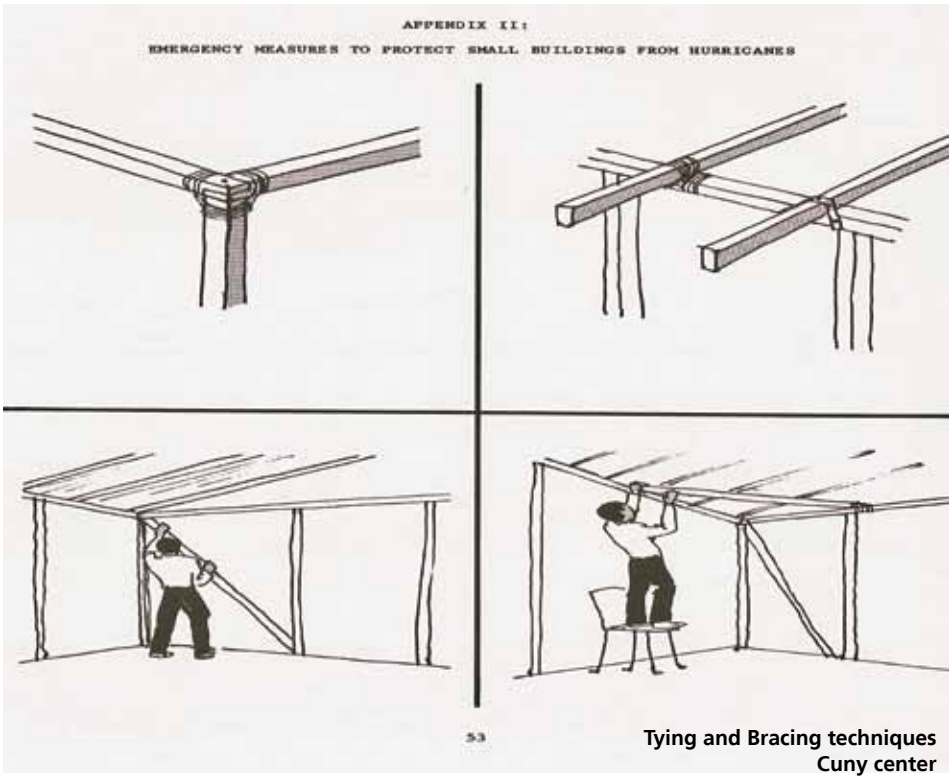


Project timeline

Summary:

Because most people were able to rapidly repair their own houses, quick impact projects were set up to allowed villages to repair communal facilities. Responsibility and control for these projects were given to beneficiary villages.

In parallel, a project to raise awareness of how to build back safer was established. This included numerous illustrated information booklets.



Tying and Bracing techniques
Cuny center

C.19 Turkey, Caldiran - 1976 - Earthquake

Case study: Shelter construction

Case study credit: UNDRO 1982

Disaster:
Earthquake Caldiran (Van)
Turkey

Disaster date:
24 November 1976

Number of houses damaged or destroyed:
14,450

Number of people displaced:
51,000

Value of damage:
3.2 billion USD

Value of assistance:
17.4 billion USD for relief and reconstruction from external sources. Monetary value of assistance from inside Turkey unknown, but considerable in terms of prefabricated housing alone.

Occupancy:
95% occupancy for winterised tents; low for other tents
100% occupancy for self built and improvised shelters

Project timeline

April to November 1977 – 10,000 asbestos prefabricated houses constructed

2 months – Approximately 200 families evacuated

6 weeks – Tents, including winterized models, were provided

24 November 1975 – Earthquake

Emergency

Survivors were encouraged by the government to move away from the affected area. One designated area was the Aegean coast. Prefabricated frame houses built with asbestos panels and timber were constructed after winter.

Tents were provided to accommodate families during the harsh winter conditions until prefabricated housing could commence in April 1977. Building work was not possible during the winter. There were difficulties in obtaining winterized tents, as the entire world stockpile was inadequate.

Reconstruction

The Ministry of Reconstruction and Settlement provided prefabricated housing for all families.made homeless by rockfalls. The housing policy was to provide prefabricated homes, and not to rebuild in local building tradition. The town of Lice was planned for an eventual population of 20,000, twice the pre-earthquake total. Some of the housing assistance from external sources, notably Libya, incorporated employment provision and shelter for animal shelters.

Strengths and weaknesses

× Advice was not provided for the improvement of traditional adobe or masonry dwellings.

× The government policy of relocating families in other parts of Turkey was interpreted by some critics as politically motivated. Few families took up the offer of removal costs, or provision of new land and livestock.

- In the worst winter earthquake in Turkey for 40 years, authorities feared that vast numbers of survivors would die of exposure to the harsh climate. Winterized tents, with heating and insulation were requested from world-wide sources. The assumed need was probably incorrect, as is evidenced by the resourcefulness of surviving families, who improvised by half submerging makeshift shelters in the ground.

- The Government (as in Lice in 1975, page 112), adopted a policy to provide prefabricated housing, with plans to build 10000 units. No attempt was made to provide resources to train local builders in antiseismic construction of traditional buildings.

- The prefabricated housing policy was underpinned by the extensive aid provided by donor governments, with particular emphasis on aid from Arab countries.

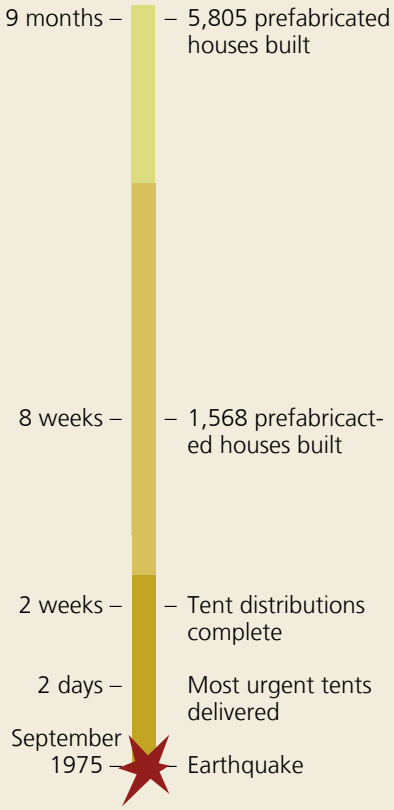
C.20 Turkey, Lice - 1975 - Earthquake

Case study: Town relocation

Case study credit:
UNDRO 1982

Disaster:
Earthquake
Location:
Lice, Turkey-September 1975
Population Pre-disaster:
50,000 (8,100 in Lice town)
number of people Homeless:
5,000
Number of houses damaged or destroyed
16,160
Occupancy:
90% of tents.
10% of 463 Polyurethane igloos were occupied
Value of damage:
Estimated between 17 million USD and 34 million USD.
Value of assistance:
$34 million (internal sources)
$15.7 million (external sources).

Project timeline



summary

The emergency shelter policy was to provide over 3600 tents through the Turkish Red Crescent, and to accelerate reconstruction. Voluntary Agencies followed their own policies, e.g. the Oxfam built 463 igloos.

The Ministry of Reconstruction and Resettlement moved the town of Lice 2 km to the south due to the risk of rockfalls at the old site.

The housing policy was to provide prefabricated homes, not to rebuild in local building tradition. The town of Lice was planned for an eventual population of 20,000, which was twice the pre-earthquake total.

Some of the housing assistance from external sources, notably Libya, incorporated employment provision, animal shelters, and other benfits

Strengths and weaknesses

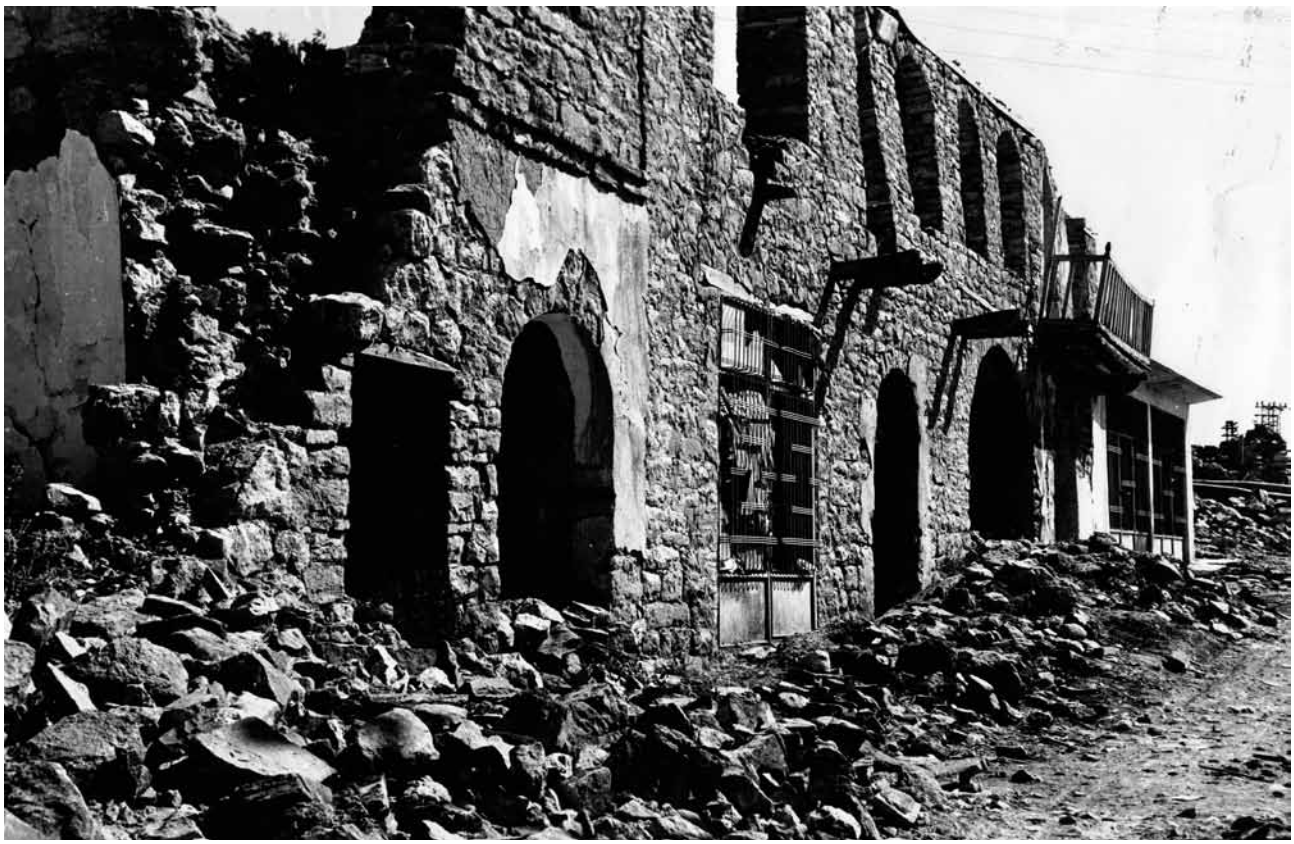
✓ Tents effectively met short-term needs. A particular quality of Red Crescent policy was to ask surviving families to make new tents to replenish the stockpile while using their own tents.

× Of the 463 Oxfam igloos, 44 were damaged, and it is probable that fewer than 50 were used. They failed on grounds of high cost, timing, fire risk and cultural issues. After the experience in Lice, Oxfam abandoned the system.

× The decision to relocate Lice has been very unpopular with its residents, and was made without their participation. The new site did not possess climatic shelter from the hillside, took valuable agricultural land out of use, and was initially without water supply. The new choice of a flat site may have been influenced by the requirements of the prefabricated houses.

× The capacity of the Turkish Government to build prefabricated houses so rapidly (1,568 units in 54 days) was an achievement. However the houses had many deficiencies: climatic and cultural unsuitability; no provision for animals; they were too small; and they did little to generate local work. Essentially, they reflected an urban middle class set of values, in sharp contrast to rural values and priorities.

- Lice was the second major disaster to attract extensive financial aid from the Arab world, contributing of 11 million USD out of 15.7 million USD of external aid received, resulting in an imaginative project by Libya.



Traditional masonry housing in Lice in eastern turkey that was damaged in the earthquake of September 1975. The old town of Lice was sited on a steep hillside (vulnerable to rock falls in any future earthquake.) The government decided to move the settlement to a new safe location, in a plain at the foot of the slope. However, this land was prime agricultural land. Further the hillside provided better protection from northerly winds than the new exposed site.
Photo: Ian Davis

A family added this porch to their new prefabricated home. It is an example of the need for protection for an animal, and also some protection for the door.
Photo: Ian Davis

C.21 Turkey, Gediz - 1970 - Earthquake

Case study: Overview

Case study credit:
UNDRO 1982

Disaster:
7.2 magnitude earthquake Gediz Turkey

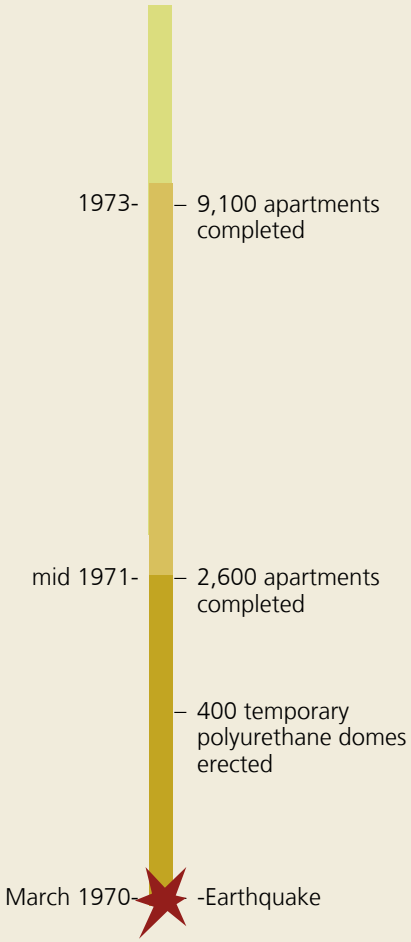
Disaster date:
28 March 1970

Number of houses damaged:
20,000

Number of people displaced:
90,000

Value of damage:
23 million UsD (at 1970 value)

Project timeline



Summary

In Gediz temporary shelter was used only for a very short period. in Ackaalan 400 polyeurythane domes were built and occupiedt. Imported labour was used for the clearing rubble.

The Government decided to rebuild Gediz 5 km to the south of the destroyed town. The town of Ackaalan was rebuilt on the original site. The government built 9100 apartments in three years.

Strengths and weaknesses

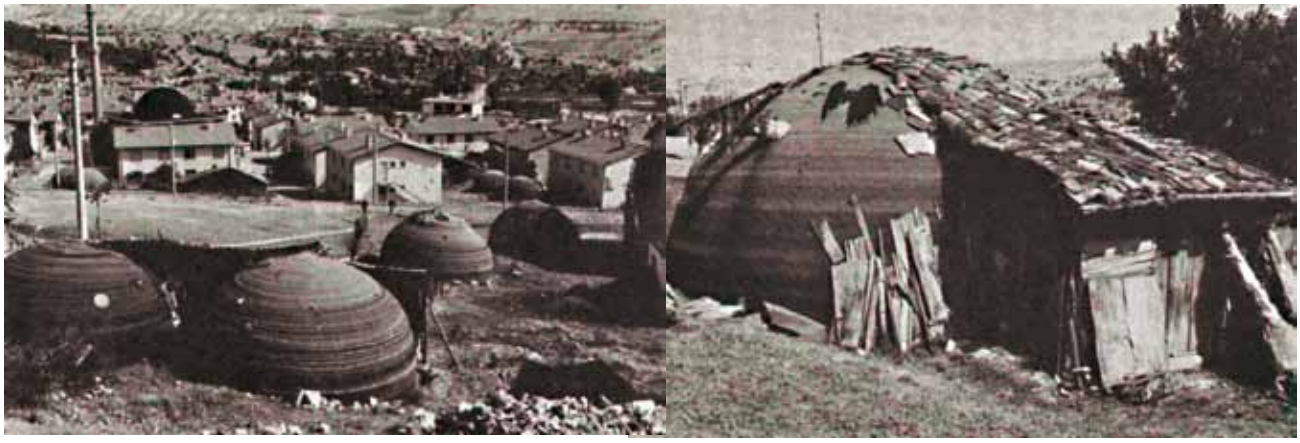
✓ Residents of Ackaalan argue that a longer period in temporary accommodation gave rise to better construction of permanent homes due to increased time available for construction.

× The relocation of Gedez has created long-term problems, occupants still maintaining close links with the old town.

× Coordination between village communities and Government planning officers was not satisfactory.

× The very swift reconstruction of buildings created many problems. Local residents believed that more time could have been devoted to the planning process with long-term benefits.

Maps of a neighbourhood of the resettlement village of new Muhipler drawn 13 years apart. Left 1971, Right 1984
Illustration: Housing and Culture after Earthquakes / Yasemin Aysan / Paul Oliver / Ian Davis



Polyurethane 'igloos' were deployed. An experiment that was discontinued after the 1975 Lice earthquake
Photos: Housing and Culture after Earthquakes / Yasemin Aysan / Paul Oliver

C.22 UK - 1945 - Post conflict

Case study: 1940s Transitional shelter

Case study credit:
Ged Robinson

Country:
UK

Disaster:
World War 2

Disaster date:
1939-1945

Project target population:
Over 2,750,000

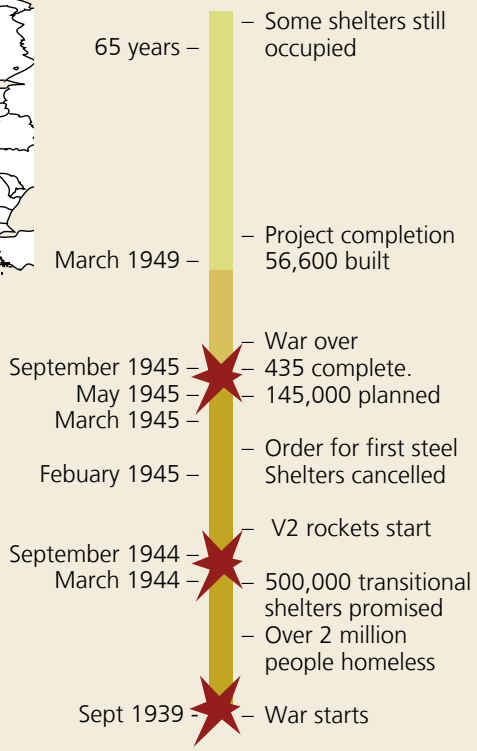
Families supported:
156,600 houses built between 1945 and 1948

Occupancy rate on handover:
High; many still occupied 65 years later.

Shelter size:
57m². living room, two bedrooms, kitchen, bathroom, WC and shed.

Materials Cost per shelter:
1,300 GBP (1945 prices) to 1,600 GBP
Compared to 1000 GBP for a brick house with three bedrooms

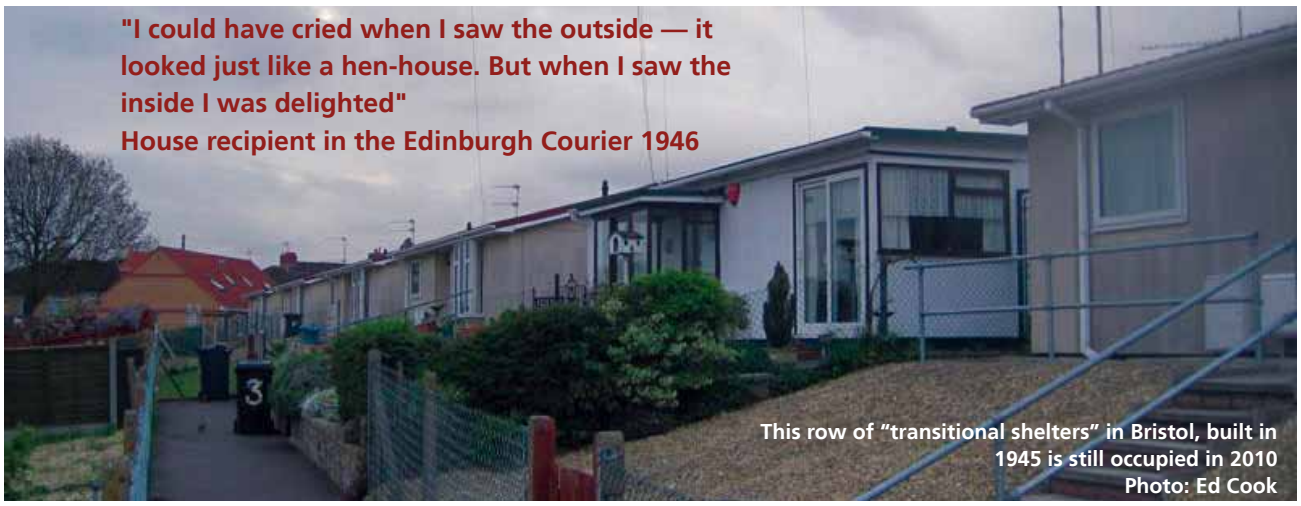
Project timeline



Summary
To meet the housing crisis of 1945 at the end of the second world war, the British government built 156,600 prefabricated houses as a temporary measure over the space of three years. 65 years later, many of these houses are still occupied. However the houses were comparatively expensive, and the programme failed to address the underlying issues of land ownership.

Strengths and weaknesses

✓ Large number of houses built in three years
✓ Many have remained in use, housing people for over 65 years
✓ Many owners preferred them to later housing schemes, especially multi-story projects, in later years.
✓ Houses came fitted with luxury modern conveniences such as fridges.
× Houses cost approximately twice the price of a traditional brick masonry house. Units costs were high.
× Due to multiple designs adopted, economies of scale, that were anticiapted through mass production, were not made.
× Underlying issues of land ownership were not addressed in the housing policy.
× Detached bungalows, designed with the long side facing the road, required large building plots and excessive amounts of land.
× A steel prototype was rapidly developed by the government to fulfil a political need. Howeveer it was later abandoned and as a result, significant funds were wasted.
× Use of asbestos later led to safety challenges when miaintaining or demolishing houses.
× Production was much lower than originally expected.
× Funds were used for temporary rather than permanent housing.
× Temporary housing sites still needed the same infrastructure investment as permanent housing would have done.
- Land for the houses was allocated for 10 years. However many remin in use, 65 years later.
- The Ministry of Health (with key responsibility for housing) was against the provision of large-scale temporary housing, fearing shanty towns would be created.



This row of "transitional shelters" in Bristol, built in 1945 is still occupied in 2010
Photo: Ed Cook

Background

Heavy bombing from August 1940 onwards left two and a quarter million people homeless in the UK. The deployment of V2 rockets left another 500,000 people homeless.

As an emergency measure after rocket damage, the government supplied UniSeco temporary huts and Orlit asbestos cement Nissen huts to provide emergency cover. Latrines were provided in blocks of two. An additional 8500 prefabricated houses were donated by USA in 1945. The cost of these temporary solutions quadrupled during the war.

Following the bombardments of 1941, and throughout the war, the housing shortage lead to people having difficulties in finding houses, and landlords demanding large amounts of 'key money' before renting properties. The majority of people who had lost their houses were hosted by family members. Other people squatted disused buildings. At the end of the war homeless people illegally appropriated redundant army huts.

During the war, the post-war housing programmes had been delayed, due to strong opposition from landowners over the compulsory purchase of land that would be required. Land usage issues exposed the party political tensions within the coalition. Sidelining these issues meant that a housing policy was not in place at the end of the war.

When the war ended, large numbers of troops returned and a general election was also due; the housing crisis became a critical issue on the political agenda.

Politically, the situation regarding housing was complicated by the involvement of different line ministries. In England housing was primarily the responsibility of the Ministry of Health, but additionally the Ministry of Public Works, the Ministry of Town and Country Planning, the Ministry of Supply, the Ministry of Production and the Secretary of State for Scotland all had responsibilities.

Land ownership

Discussions over land prevented a housing reconstruction policy from being agreed in the aftermath of the war. As no political party in the government had a clear majority, discussions were held up between wealthier landowners and those wishing for a more equitable distribution of land.

The government wished to fix compensation for land at 1939 values. This was in a context of rapidly rising land prices and property speculation with the end of the war, and disagreement over betterment (betterment is when the price of land goes up after it has been granted of planning permission).

Transitional houses

Prefabricated houses initially appeared to be a politically perfect solution. They would be owned by the government, mass produced in redundant war-time factories and could be erected on bombed sites, avoiding some of the challenges for land acquisition.

A fact-finding mission was sent to United States of America to learn from the production of prefabricated shelters. In America, there was an existing industry building prefabricated mobile homes. This industry had grown significantly during the war.

The prefabricated shelters in America included permanent, temporary or demountable shelters, and portable trailer caravans, whose wheels would be removed once they were in place. Such houses were owned by the United States government with local government acting as owner representatives. Factories were producing over 2000 trailers per month.

In England however, there was no such industry, and a major investment in equipment would be required.

The approach chosen was to provide prefabricated structures with prefabricated fittings, including kitchen and bathroom units and plumbing systems.

Beneficiary selection

Selection criteria for which families would be prioritised to live in the prefabricated houses were not clear.

First prototype – the Portal House:

The first prototype developed in secrecy was a prefabricated single-storey house with two layer steel walls. There was an aluminium foil lining between interior and exterior walls. The houses were built on a concrete slab and had fitted steel furniture.

In cold weather, the steel prototype suffered severely from condensation. Boiling a kettle would cause condensation to run down the walls. In low temperatures, the condensation would freeze inside the walls. It also caused mould to form on items stored inside the kitchen furniture.

Despite initial commitments to build 500,000 of these shelters, It was discovered that production would enable a maximum of only 50,000 units in 3 years. An unexpected cost of 100 steel rolling machines that had to be imported was discovered after the Government had approved the first funds for the programme. A rising cost of coal also caused the price of steel to rise, and hence the total cost of these houses. As a result, production of this model was cancelled, in total at least 750,000 GBP had been lost with the programme.

Later models

Following the failure of the first steel prototype shelter, four main types of house were later selected, which accounted for 90% of the final houses constructed:

- Arcon – concrete base, steel frame and asbestos cement exterior cladding. The walls were insulated with glass fibre and the walls and ceiling were covered with plasterboard. Nearly 40,000 were built.
- Pheonix and the UNI-Seco – based on a military design for an office. The frame was made of plywood and timber, with asbestos wall sections. Nearly 30,000 were built.
- Tarran - a wooden framed bungalow with precast concrete panel walls. Over 19,000 were built.
- Aluminium bungalow, including the Airoh – all alumnium construction. Over 50,000 were built. The aluminium bungalow was the most expensive to produce at £1610.

What happened next?

156,600 prefabricated houses were produced between 1945 and 1949, with an anticipated lifetime of 10 years. Each house was built on its own plot, a significant amount of land.

Of the prefabricated houses built, some have remained in use over 65 years, although many now fail the government's 'Decent Homes Standard'. In general there is now a policy of replacing prefabs, although this is moving into redevelopment of sites as it is cheaper to demolish and rebuild rather than continue to repair them.

The prefabricated shelters were expensive to build and required large plots of land. After 65 years of use, many are now being demolished as they are too expensive to maintain. Photo Ed Cook

C.23 Yugoslavia (formerly) - 1963 - Earthquake

Case study: Shelter construction

Case study credit: UNDRO 1982

Disaster:
6.9 Richter scale earthquake
Skopje, Yugoslavia

Disaster date:
26 July 1963

Population pre-disaster:
200,000

Number of houses damaged:
30,000

Number of people displaced:
160,000

Value of damage:
1 billion USD (at 1970 value)

Project timeline

- Some people remain in temporary houses
- Some people move into new prefabricated houses
- 5 months – People move into 1,711 temporary houses
- 4 months – Tents stop being used
- 3 weeks – 50,000 women and children leave city
- 24 hours – 5,000 tents provided to 25,000 people
- 26 July 1963 – Earthquake

Emergency shelter

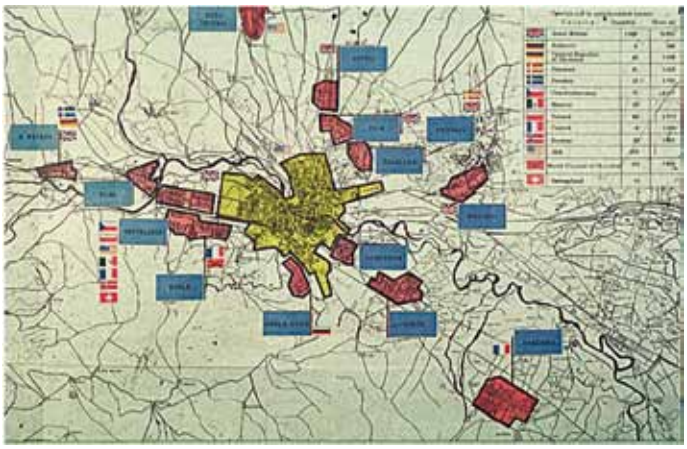
A national preparedness organisation assumed control and implemented an evacuation policy. 150,000 women and children left the city within 3 weeks; 60,000 men were available for cleaning, repairing and erecting housing; 1,900 prefabricated 'temporary' houses were built by international organisations; they were intended for eventual agricultural use.

Reconstruction

A decision was made to requisition land to build 14,000 houses for a total of 70,000 people. Repairs to existing houses were undertaken to provide housing for 80,000. A new town plan was designed and implemented. This included an international competition for the design of the city centre.

Strengths and weaknesses

✓ The emergency organization was highly effective.
✓ The ability to requisition land contributed to the rapid reconstruction of houses. Another contributory factor was the massive aid received from Eastern and Western European sources (82 countries).
✓ Overall there was a balanced, diversified approach to shelter provision which satisfied the needs in spite of the exposure threat of cold weather, which came 3 months after the disaster.
× The tents were not all used.
× The evacuation policy was only partially effective (all returned within 3-4 months).
× Needs of ethnic minority groups (40 per cent of the population) were insufficiently considered by authorities.
- The estimated damage total was US$2,4 billion, while the overall cost of reconstruction was in the order of US$40 billion.
- Much of the damage to property can be attributed to (a) rapid urbanization in the preceding decade; (b) damage to building foundations in the 1962 flood.



Map prepared by authorities (using army engineers) immediately after the earthquake to indicate the sites (in purple) of temporary housing. The temporary housing was built with a 9 month lifetime. These temporary housing sites inevitably became permanent and adversely influenced the layout of the future city development.

**US army Quonset huts built after the earthquake.
Top image: taken in 1974,11 years after the earthquake.
Bottom image: taken in 1987, 25 years after the earthuake. Two of these huts had been elevated and joined together to form a small cinema.**

Annex

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Guidelines and tools for implementing reconstruction programmes. Includes programme development, participatory process, technical support and financial assistance.

IFRC Guidelines for cash transfer programming
Available online: www.ifrc.org

The Sphere Project, The Humanitarian Charter and Minimum Standards in Disaster Response, 2004
Available online: www.sphereproject.org
Sets out what people affected by disasters have a right to expect from humanitarian assistance. Includes shelter and settlement planning, with standards, indicators and checklists. Revision due in 2010.

Sultan Barakat, HPN Network paper 043, Housing reconstruction after conflict and disaster, ODI, 2003
Available online: www.odihpn.org/documents/networkpaper043.pdf
Review of housing reconstruction experiences and approaches.

UNDRO, (now UNOCHA), Davis, I., Shelter After Disaster, Guidelines for Assistance, 1982
Available online: www.shelterlibrary.org
(www.reliefweb.int/library/documents/2003/undro-shelter-jul82.htm)
Guidelines and description of shelter provision in all aspects of natural disasters (from preparedness to reconstruction).

UN/OCHA, Transitional Settlement and Reconstruction after Natural Disasters, field edition, 2008.
Available online: www.shelterlibrary.org
Guidelines aimed at strategic planners and implementers of settlement responses. Considers settlement issues for people affected by disasters as well as assitance methods to support them in their reconstruction.

Websites

www.disasterassessment.org
A place where members of the disaster management community can meet to exchange tools and case studies related to disaster risk assessment. Shelter Projects 2008 and Shelter Projects 2009 can be found online at this site.

www.humanitarianreform.org / www.oneresponse.info
The home pages of the project to establish clusters as a coordination mechanism. Includes links to the shelter cluster and the Early recovery cluster. Contains further reading and links to current documents for major responses.

www.ifrc.org/where
Where the IFRC works: archive of operations updates and reports from the International Federation of the Red Cross and Red Crescecnt Societies.

www.reliefweb.int
Up to date information on complex emergencies and natural disasters as well as an archive of information, field reports and situation reports from emergencies since 1996.

www.shelterlibrary.org
A library of free documents relating to transitional settlement and reconstruction.

www.youtube.com/user/ifrc
Video channel for the International Federation of the Red Cross and Red Crescecnt Societies. Includes videos of soem of the projects in this book.

By the end of 2009, over 43 million people worldwide had been forcibly displaced due to conflict and persecution. In addition, during 2009, 335 reported natural disasters killed over 10,000 people and affected more than 119 million people. The corresponding scale of global shelter need has required a diversity of approaches that go beyond simple design solutions.

Spanning humanitarian responses from over 60 years, Shelter Projects 2009 is the second annual compilation of shelter programmes. The project summaries included aim to illustrate some of the project options available to organisations working in both post disaster and post conflict situations, as well as to support learning from the strengths and weaknesses of different projects. The focus of this book is on projects that maximise emergency response funds to support sustainable recovery.

This document is targeted at:

Humanitarian managers and field shelter programme staff from local, national and international organisations at all levels of experience.

International Federation
of Red Cross and Red Crescent Societies

The International Federation of Red Cross and Red Crescent Societies (IFRC) promotes the humanitarian activities of National Societies among vulnerable people.

By coordinating international disaster relief and encouraging development support it seeks to prevent and alleviate human suffering.

The IFRC, the National Societies and the International Committee of the Red Cross together constitute the International Red Cross and Red Crescent Movement.

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Saving lives, changing minds.

HS Number HS/172/10E
ISBN Number:(Volume) 978-92-1-132285-9

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Printed by:
Musumeci S.p.A 11020, Quart (AO), Italy

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