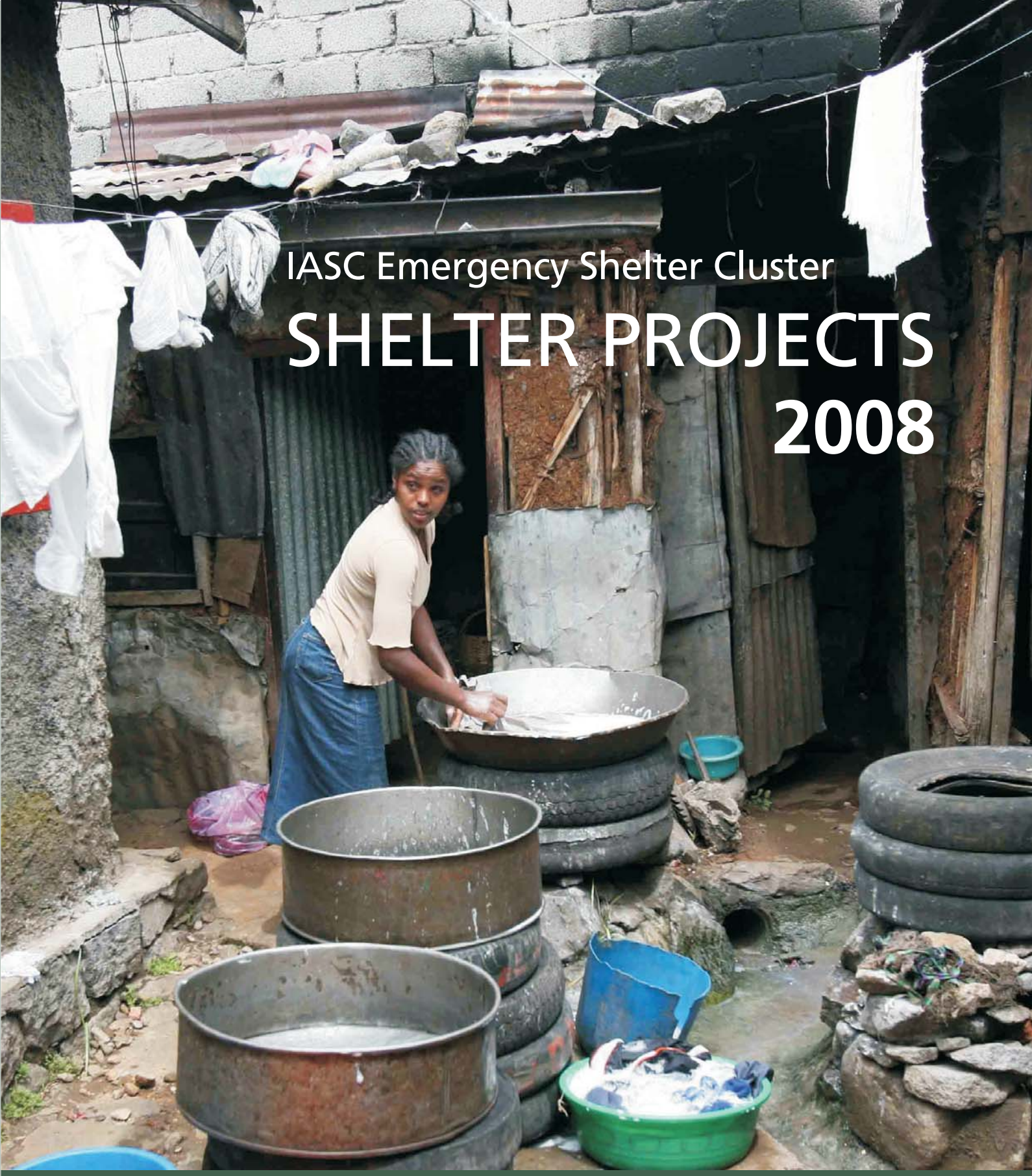

IASC Emergency Shelter Cluster

SHELTER PROJECTS 2008

UN HABITAT

UNHCR
The UN Refugee Agency

International Federation
of Red Cross and Red Crescent Societies

Foreword

Shelter Options 2008

Much has been written over the years about the challenge of providing shelter for households affected by crises, whether they are human-made or result from natural events. In spite of the many reports commissioned by governments, donors, independent experts, multilateral and international aid organizations that provide a variety of recommendations on issues ranging from design to cost analysis methods, shelter remains one of the most controversial and challenging components of sustainable recovery from disasters.

In recent years, the humanitarian community has looked inward, learning from their past experiences in providing emergency shelter for the ever-increasing number of populations suffering from crises worldwide. The humanitarian reform process has helped widen the community of practitioners, reinforced global and country-based coordination systems, and required the agencies concerned to seek new and better means of ensuring integrated and robust humanitarian programming.

This publication is an example of a series of learning tools being produced to support improved response to crises. It has been developed by the Emergency Shelter Cluster through a group of agencies within the cluster led by UN-HABITAT. It contains summaries of a range of experiences applied in crisis situations, and an honest appraisal of their successes and failures. From these, a number of key principles emerge.

One key principle is that the survivors of these crises must be given every opportunity to engage in their own recovery. Disaster-affected households should no longer be treated as liabilities. This has significant implications on recommended approaches to post-disaster shelter and settlement responses, several of which are well illustrated in the case studies in this publication.

A second principle is that without immediate strategic planning covering land use, tenure, livelihoods and critical services, in addition to shelter options, there is a danger that temporary solutions become, de facto, permanent ones. As well as failing to address the risks and vulnerabilities that may have contributed to the scale of the crisis, poor or inadequate programmatic responses can increase shelter and settlement vulnerabilities. A number of the case studies illustrate these considerations.

A third principle follows from the above – that is, all change demands social mobilization, the involvement of the affected population and the appropriate local authorities, and legal compliance. Immediate shelter solutions *must* therefore consider long-term settlement issues, both for temporarily displaced populations and those who are able to return to the location of their damaged or destroyed shelters. The cultural, social and economic norms of the specific disaster-affected societies must be reflected in shelter and settlement responses that may potentially become durable, rather than transient, in nature. Non-tent based emergency shelter solutions that are rapid and cost effective can also be culturally acceptable to the populations they are designed for, in both the short term and over a longer period of recovery. This publication highlights a number of such examples.

A final principle follows from the three outlined above. Putting people (survivors and victims) first, planning and programming in advance, considering the potential of longer term solutions, and finally, creating space to address land and property-based losses following a crisis, all contribute to reducing demand on humanitarian capital while maximizing potential opportunities for recovery.

There are many more lessons in this book that will be of benefit to the reader. On behalf of our agencies, and in collaboration with our interagency partners from the Emergency Shelter Cluster, we encourage the study and widespread use of these lessons.

Acknowledgments

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Contents

Introduction

The case studies in this book are of real shelter projects that have been implemented. Each project is specific to an individual context and is the outcome of local assessments and monitoring.

None of the case studies in this book should be directly copied.

Because these projects were implemented in diverse and often challenging conditions, they illustrate both good and bad practices. From every case study there are lessons that should be learned, and aspects that should be repeated or avoided elsewhere.

Global shelter need

It is estimated that over 5 million people were made homeless by conflict and natural disasters in 2007[1]. This corresponds to approximately 1 million families. While the largest proportion of people made homeless by conflict are in Africa and the Middle East, the majority of those made homeless by natural disasters are in Asia. Although the numbers of people displaced by conflict and natural disasters over the past ten years run into the several millions, they are significantly lower in Latin America and the Caribbean than in Africa, the Middle East and Asia.

There are approximately 40 million refugees and internally displaced people in the world - people who have been forced to leave their homes...

While the number of people made newly homeless in 2007 was in excess of 5 million, a significant proportion of people are not able to return to their place of origin for many years. As a result, the total number of people displaced in the world has remained roughly constant at approximately 15 million refugees[2] and a further 25 million internally displaced people (IDPs)[3].

IDP estimates by region (2007)

Region	Number of countries	IDPs (millions)
Africa	20	12.7
Americas	4	4.2
Asia and Middle East	18	6.6
Europe	10	2.5
Total	52	26

Estimated number of people made homeless by natural disasters (other than drought) 2000-2008[4]

Region	Number of homeless (in millions)
Africa	2
Asia	20
Latin America and Carribean (LAC)	1.5
Europe	0.1
North America	0.1

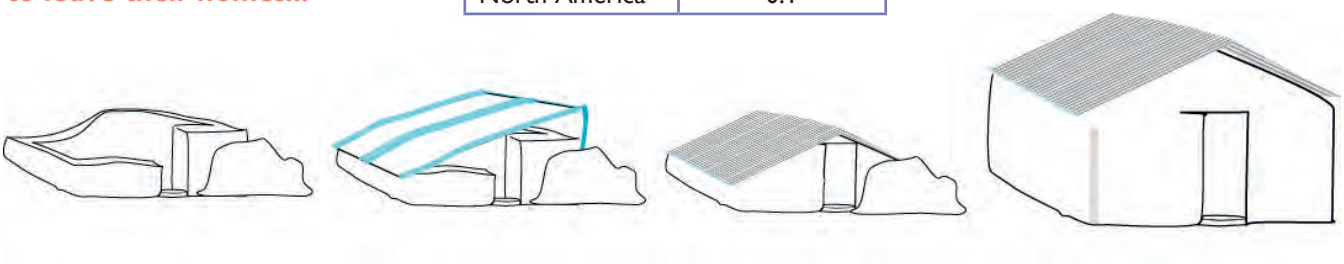
Selection of case studies

Given the scale of emergency shelter need every year, the case studies in this book focus on implemented projects rather than small-scale trials or concepts that were not implemented on any scale. There is also a regional bias towards Africa and Asia, where the post-disaster and post-conflict shelter needs are largest.

The case studies were selected according to the following criteria:

- The shelter project had to have been implemented in full.
- A minimum of 500 families were sheltered by the project's activities.
- The project was implemented largely within the first year following a natural disaster. For conflict-affected populations, chronic emergencies and returns processes, longer timescales were considered.
- Accurate project information was available from the staff involved in the project implementation.

The case studies that have been selected are intended to illustrate a diversity of approaches to helping meet shelter need. Most of them go beyond 'throwing shelter relief items off the back of a lorry' or delivering shelters as a design or a product.



1. This figure was reached by combining the figure from the Emergency Events Database (http://www.emdat.be) for the number of people made homeless with the figure of 3.7 million new IDPs quoted in *Internal displacement: Global overview of trends and developments in 2007* (Internal Displacement Monitoring Centre). This figure excludes new refugees.
2. A refugee is a person who has crossed an international border and is unable to return through well-founded fear of persecution (see UNHCR *Handbook for Emergencies*, 3rd edition, 2007, for a fuller definition).
3. IDPs are broadly defined as people who have been forced to flee their homes suddenly or unexpectedly in large numbers as a result of armed conflict, internal strife, systematic violation of human rights or natural or man-made disasters and who are within the territory of their country.
4. This data is sourced from the Emergency Events Database (http://www.emdat.be) on 30 July 2008.

Overview of case studies

The case studies in this book cover a diversity of projects, from support for families in collective buildings over an eight-year period (Azerbaijan, B.2), to emergency distributions of plastic sheeting within hours of an earthquake (Jogyakarta, B.7). Despite the projects' differences, there are many recurring themes. Some of these themes are discussed in the following pages.

Support the people affected

The first and main effort in all responses is made by the people who are themselves affected. Of the case studies listed in this book, the more effective projects all had the close involvement of the people affected, often through existing community groups or specially established committees.

📖 Sphere standards and indicators (Annex) provide common standards on participation, initial assessment, monitoring and evaluation.

📖 Supporting the people affected is the first principle outlined in the guidelines of *Transitional Settlement and Reconstruction after Natural Disasters* (Annex).

	Non-food item distribution		Shelter construction			Labour			
	Household	Shelter	Transitional	Permanent	Cash	Community	Contracted	Direct	Technical expertise
A.1 D.R. Congo - 2002		●	●					●	●
A.2 Eritrea - 2002	●	●							●
A.3 Kenya - 2007			●			●			
A.4 Kenya - 2007		●	●						●
A.5 Liberia - 2007		●		●	●				●
A.6 Mozambique - 2007		●							
A.7 Rwanda - 2006		●		●		●		●	●
A.8 Somalia - 2007				●					●
A.9 Sudan - 2004	●	●							
B.1 Afghanistan - 2002	●	●		●	●			●	●
B.2 Azerbaijan - 1997			●				●		●
B.3 India (Gujarat) - 2002	●		●					●	●
B.4 Indonesia - 2004		●		●	●	●	●	●	●
B.6 Indonesia - 2006	●		●		●	●		●	●
B.7 Indonesia - 2006	●	●	●						●
B.8 Ingushetia - 1999			●		●	●	●	●	●
B.10 Pakistan - 2006	●		●			●		●	●
B.11 Pakistan - 2006	●	●				●			
B.12 Sri lanka - 2007			●	●	●	●			●
B.13 Sri lanka - 2005	●		●		●	●		●	●
C.1 Honduras -1998			●		●	●			●
C.3 Peru - 2007			●			●			
C.4 Peru - 2007			●		●	●		●	●
C.5 Peru - 2007			●		●	●	●		●

Overview of assistance methods used in projects

Graphics: Transitional Settlement and Reconstruction after Natural Disasters

Settlement Options

The case studies illustrate support for disaster-affected people in a variety of settlements. These include host families (Ingushetia, B.8), collective centres (Azerbaijan, B.2), both rural (Pakistan, B.9) and urban (Somalia, A.8) contexts, and planned and unplanned camps (Bangladesh, D.4).

It was relatively difficult to find case studies of supporting host families.

Finding shelter with friends and relationsor by renting are common coping mechanisms for families who have lost their house in a disaster. However, it was difficult to find case studies of organisations providing support for hosting or rental arrangements.

📖 *Transitional settlement: displaced populations* (Annex)

In most case studies, land ownership was a defining factor in what types of shelter support were offered.

Land ownership

Those without land are often among the most vulnerable people in society. Approaches to land ownership varied between the case studies. For example, in Peru (C.2-C.5) organisations built primarily only on the land of people who could offer proof of land title. Building lighter shelters allowed people to later move them.

A more active approach to establishing land for families is illustrated by the case study in Aceh, Indonesia (B.4) after the tsunami, where the organisation helped to negotiate land with title deeds for entire villages.

Phases of response

Responses to disasters or conflict are commonly split into the phases of:

- preparedness before the disaster;
- emergency response;
- the recovery phase; and
- durable solutions.

Many of the case studies include shelter responses aimed at bridging the gap between emergency shelter and durable housing solutions. Housing programmes can take many years to complete, especially when implemented on a large scale. The project in Rwanda (A.7), 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.

A comparison of the strategies adopted in Aceh (B.4) and Sri Lanka (B.11) following the 2004 tsunami illustrates how long housing can take to complete in comparison to transitional projects. However, as the case studies note, in implementing the transitional response there should be a vision of what is being transitioned to. Often, there is not follow-on funding or land identified for permanent houses.

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 Pakistan (B.9-B.11) illustrate this challenge. One project delivered materials to over 2% of the affected population without support, while the other project built transitional shelters for 0.2% of the affected population.

Which is better: a high level of support for fewer people or a lower level of support for more people?

Self-build and contractor models of construction

Different projects used different ways of organising the labour required to build shelters. The case studies in Peru illustrate a mixture from self-build (C.4) to supported self-build (C.3) approaches, to contractors prefabricating shelter components that were then erected by homeowners (C.5). Many of the projects in this book provided carpenters or masons to support self-build projects. In many projects, families were provided with some money to either support them while building or to allow them to employ others to build.

Logistics and supply

In many projects, logistics and supply issues had significant impacts on both the design of shelters and the timescale for implementation. The scale of some procurements was huge (e.g. Gujarat (B.3)). Many projects, such as the one in Honduras (C.1), employed specific shelter logistics staff to ensure that shelter projects were implemented. Shelter staff had to work closely with these staff members.

Assistance methods

The case studies selected include: giving money to host families, upgrading squatted communal blocks, establishing an inter-agency pipeline of shelter items and constructing shelters through both unpaid volunteers and contractors.

It was difficult to find sufficient detail on projects where families were given vouchers that they could redeem with certain suppliers, although according to anecdotal evidence this type of project has been successfully conducted. No case studies were found of loans being provided to support families through the emergency or transitional phases of the response.

Other sectors

Many of the more effective projects were integrated with other sectors of the response, especially water supply and sanitation.

📖 The Sphere Project (Annex) provides useful guidance on integration with other sectors.

Effective shelter programmes are developed and implemented by involving the affected communities

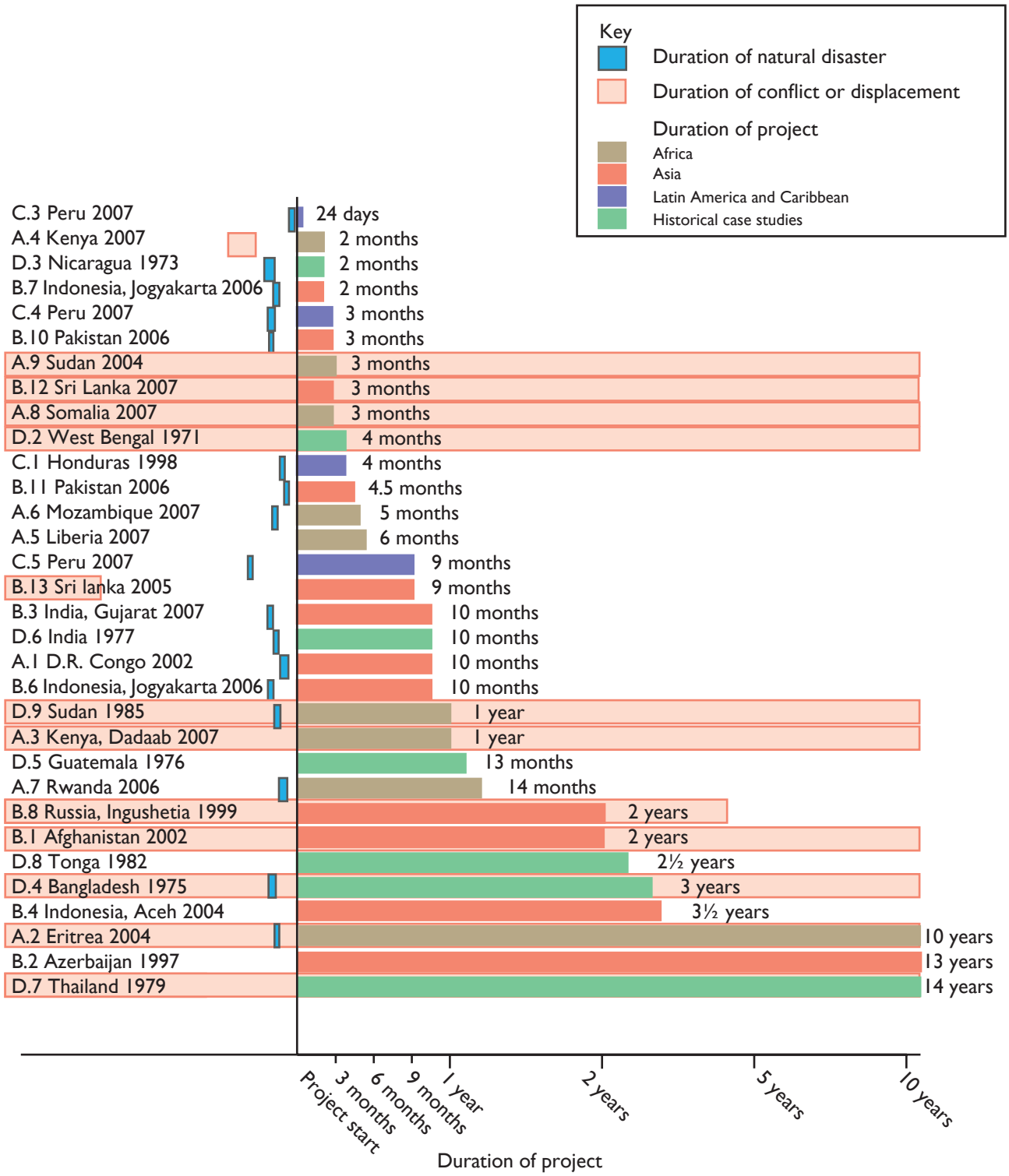


Illustration of the duration of the case studies

Shelter design

For most projects, the design of the shelters themselves was less challenging than the design and planning of the shelter project.

Many projects that built shelters left the design and construction of shelters to the people affected, focusing instead on ensuring that people had the means to build them or the support to build them safely.

All of the projects that successfully constructed a specific model of shelter developed the basic shelter model in direct consultation with affected communities, taking into account their skills, capacities and resources.

Left: Design for a timber-free domed shelter proposed as a response to an earthquake in 2005. Affectees were not involved in the design and it was not used on any scale.

Right: Shelter using reclaimed materials built by affectees weeks after the earthquake. Shelters such as this were common and supported by programmes of toolkits and corrugated iron distribution (see case studies B.10-B.12) .

'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 well-being of the people accommodated...'

- A guidance note to the Sphere (Annex) shelter and settlement standard for covered living space

Shelter size

The illustration below shows the diversity of shelter-covered areas in these case studies. These vary from 9m² (C.3) to 48m² (A.7). This is a result of varying needs, permanency, budgets, logistics constraints, host standards and official policies.

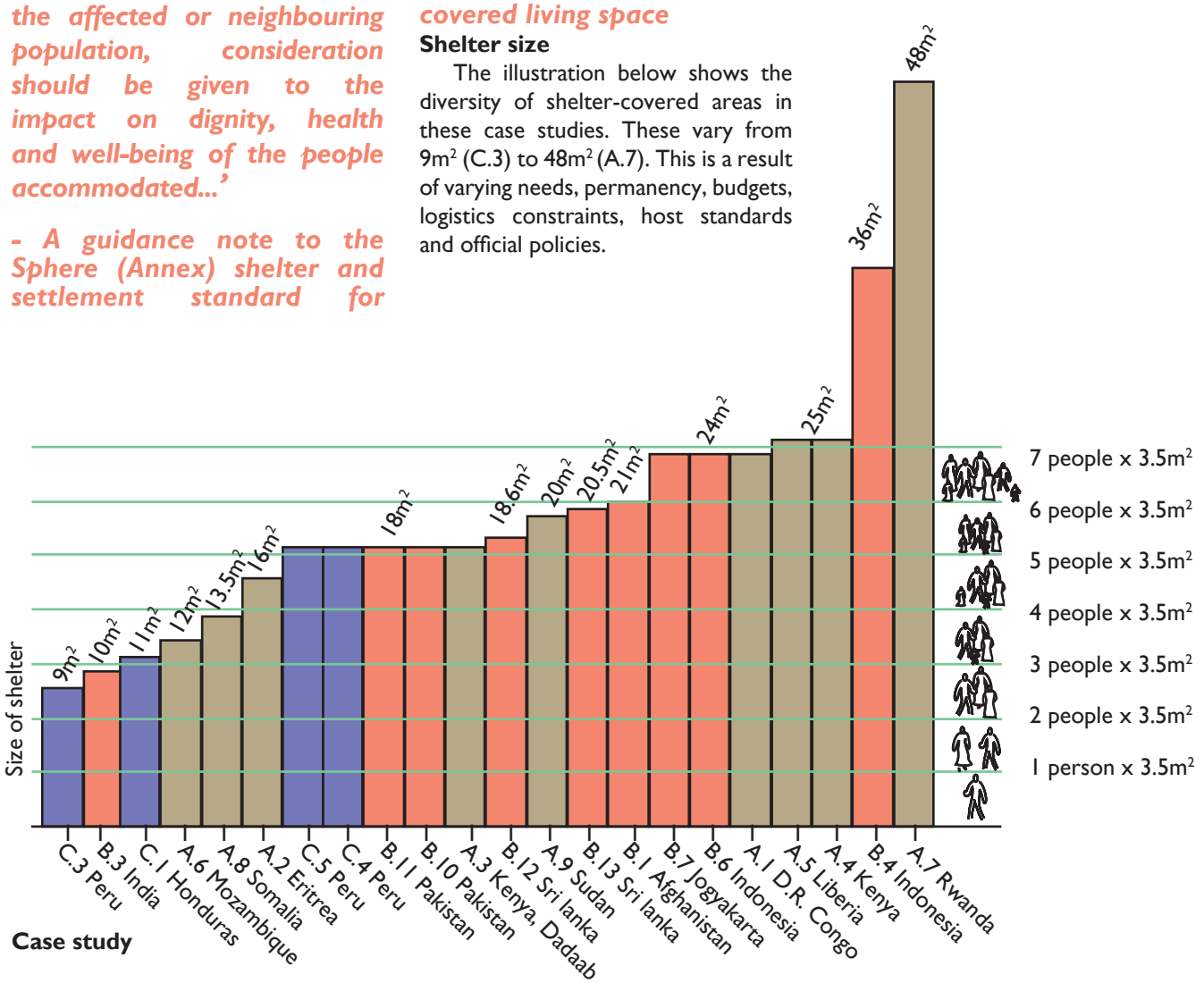
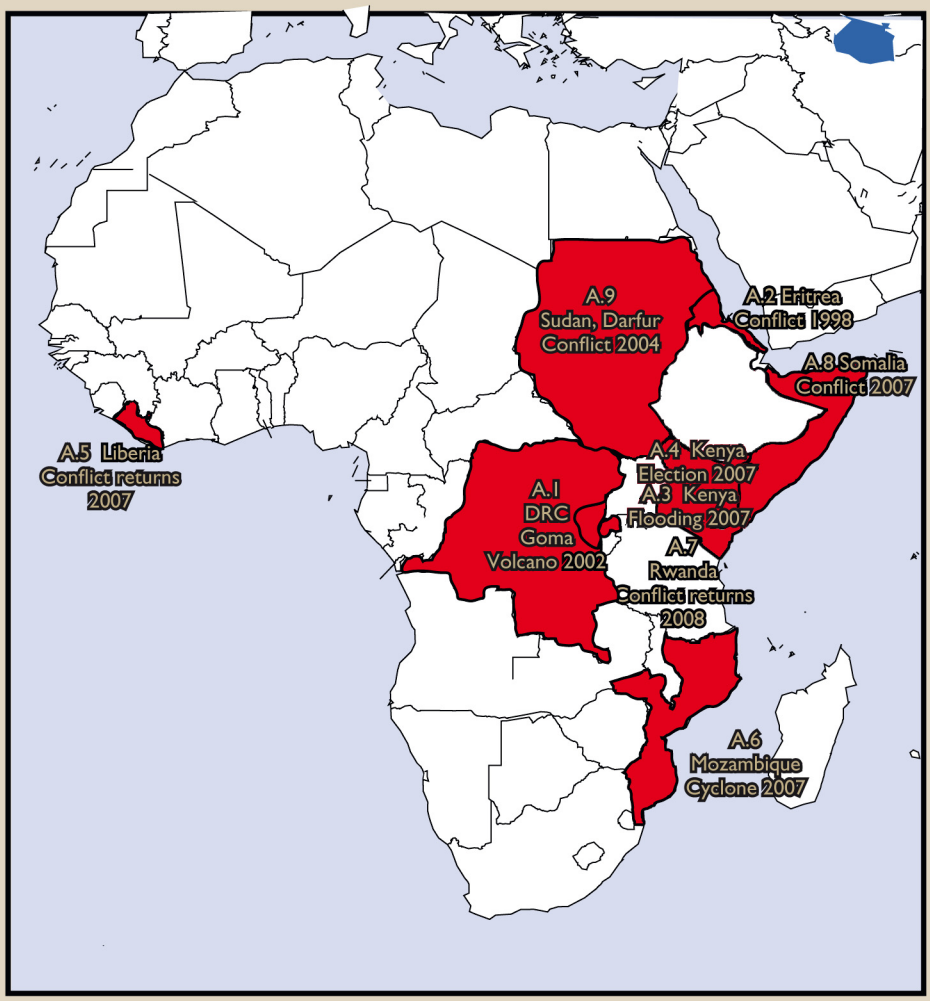


Chart showing sizes of the shelters in the case studies in comparison with the suggested allocation of 3.5m² per person. Note that smaller shelters are often constructed after assessment of local and host population standards, as well as what is practically possible. Shelter size is not necessarily a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

Section A Africa



A.1 D.R. Congo - Goma - 2002 - Volcano

Distribution and technical support

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

Disaster:
Goma volcano eruption in 2002

No. of houses damaged/people displaced:
15,000 houses destroyed; 87,000 people made homeless

Project target population:
3,000 families initially; increased to 5,000 families
Part of a joint intervention targeting 12,625 families

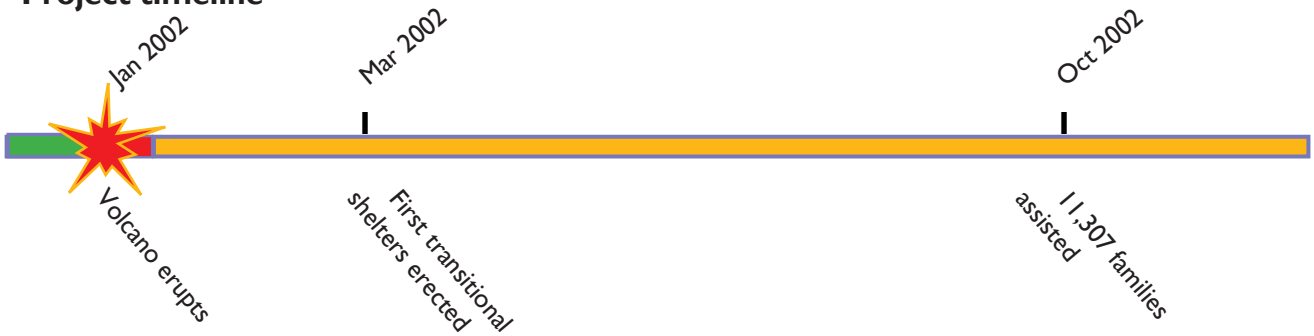
Occupancy rate on handover:
All shelters completed

Shelter size
24m²
Total materials cost: US$ 180 (including plastic sheeting)

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.

Project timeline



Strengths and weaknesses

✓ Adapting local design meant that shelters were easily constructed and durable enough to be adapted to long-term use.
✓ The self-selection of resettlement sites meant that no new site identification, preparation or infrastructure building was necessary, reducing costs and increasing the speed of plot identification.
✓ Local authorities and communities were involved in the development of selection criteria and the dentification of land plots. A good flow of information between agencies and beneficiaries through community mobilisers meant that few complaints were made about beneficiary selection.
✓ Open dialogue between agencies meant that coordination was effective.
✓ Environmental impact was minimised through the adoption of managed local construction practices and materials and the provision of pit latrines.
✓ The programme was classified as an emergency, which excluded funding of more durable solutions. Despite this, use of transitional shelters meant that beneficiaries could modify structures to later become permanent houses.
- The local economy was partly regenerated through the payment of 30,000 days of labour and the sourcing of local materials.

Strengths and weaknesses (continued)

- The affected population contributed 5,000 individual land plots, 6,000 days of voluntary labour and payment for 14,000 days of contract labour (equivalent to US$ 40,000).
- US$ 140,000 was invested by the affected population itself into the upgrading of their housing units by the end of October 2002.

× For families of eight or more people, space was insufficient.

× Some beneficiaries felt that the plastic walls compromised their privacy and security. It was easy to see what people were doing at night due to the shadows cast on the plastic by lamps and people were worried that the plastic sheeting could be easily cut by thieves.

After six years, a donor assessment found that:

- The project was used as a model for the provision of 8,000 more shelters funded by other donors.
- Transitional shelters had been converted into permanent housing.
- The Disaster Risk Reduction (DRR) projects to monitor the volcano continue, with a weekly report broadcast on local radio.

Sample of a temporary house

Situation before emergency

According to an NGO survey, Goma, an important border trading town in the north-east of the Democratic Republic of Congo, had a depressed economy before the eruption, with 46% unemployment and only 40% of people able to sustain themselves and their family on their income.

Before the emergency, shelter conditions were varied, with the average house size containing around 31.5m^2 of covered living space. The volcano had last erupted in 1977.

After the emergency

The lava flow easily set alight traditional timber-framed houses, covering 13% of the town in a layer of molten rock one to three metres deep in a single day. Much of the central administrative and commercial district was damaged, affecting the capacity of the local authorities to respond.

Some of the 87,000 people displaced sought temporary refuge in communal buildings, while others moved in with relatives whose houses had not been affected. In this way, all found some form of immediate, temporary shelter themselves without direct international agency assistance.

Approximately 80% of the affected population reported that their economic conditions had worsened as a result of the disaster. A quarter had previously used their homes as the base for their income-generating activities.

Implementation

Local authorities suggested a new area of land, largely bush land, for development into a new site. This site was rejected, as it would have required the construction of a whole new infrastructure network (roads, sanitation, etc.) as well as requiring considerable levelling. It would also have meant taking resettled people away from the economic opportunities in the town.

Instead, an emergency shelter response was jointly developed by a group of INGO, UN and local NGO representatives to provide a transitional shelter to families (who met certain criteria) once they had negotiated a new plot to build on within the town itself. This plot was either bought, rented or donated by relatives. This kept the economic activity within the town, used the existing infrastructure and ensured that beneficiaries were resettling somewhere where they wanted to be.

Two examples of the shelter were built and used as project offices so that beneficiaries knew what the shelters would look like and to make it easier to discuss construction issues. These offices, along with scale models, were used to train all households in how to build the transitional shelters.

Tools and a marked length of string, used to measure out bracing sections, were supplied with each kit. Few construction problems were reported due to the simplicity and familiarity of the design.

Although all households received training, around 70% of beneficiaries paid others to construct their housing unit.

By the end of October 2002, the joint intervention had assisted 11,307 families and plans were made to help a further 1,318. Those assisted included all of the families who had occupied the collective sites within the town itself, and families who had been 'hosted' by others.

Selection of beneficiaries

Families in collective sites (such as schools) were prioritised as local authorities wished to reopen the schools as soon as possible. The remaining

Photo: Graham Saunders

Structural skeleton of a house, showing cross-bracing

funds were allocated on a neighbourhood-by-neighbourhood basis, based on the proportion of families affected by the eruption.

A household in a neighbourhood could make an application for assistance once they could prove they had negotiated a new plot of land for rebuilding. This was verified on site through discussion with neighbours and local authorities.

Final selection was overseen by a Local Advisory Group made up of community representatives and an agency staff member, following jointly-agreed upon criteria. Decisions and details of complaint processes were published on a notice board.

Prior ownership of a property was not made a requirement for assistance, in order to ensure that people who were renting before the eruption were also able to obtain a transitional shelter.

Technical solutions

Although other emergency shelter solutions, such as tents, could have been deployed, these were rejected as they could not have been updated for permanent use. The transitional shelters cost just US$ 55 more than a standard relief tent and took longer to deploy, but provided a stepping stone to permanent reconstruction.

Photo: Graham Saunders

Families were trained to construct their shelters, but around 70% hired others to build.

The transitional shelters measured 5m x 4.8m, provided 24m^2 of covered living space for five to six people, and followed Sphere minimum standards. The dimensions were defined by locally available timber sizes, in order to maximise section spans and minimize wastage from cutting. The traditional use of volcanic rock for walls was rejected as too slow and difficult to cut and size correctly, and too expensive to transport.

The unit was designed for robustness, without the need for cast foundations, so it could be dismantled and moved if necessary. Beneficiaries were instead encouraged to build up foundations with rocks and earth in order to reduce surface water inside the houses.

The roofs were covered with corrugated zinc sheets, which, despite their high cost and solar gain, were locally known for their ease of use.

As the budget did not stretch to timber-clad walls, the design had to be braced well enough to stand unmodified. The walls were covered with plastic sheeting held in place with timber laths and protected from the weather by the overhang of the roof.

Households normally divided their houses into separate rooms, so the transitional shelter was designed to allow families to partition the space using their own materials or plastic sheeting provided by agencies.

'Goma's recovery was dependent largely on economic regeneration. By concentrating the activities within the town itself, this project considered the sustainability of regeneration'. - *Donor*

Environment

The certification of timber in the local area was difficult to verify, so timber from fast-growing eucalyptus was specified and bought from a number of different sources to minimise potential local deforestation.

Beneficiaries sometimes strengthened the frame with bush sticks. Although the potential environmental damage of this activity was not measured, alternative materials could have been considered at the start of the project.

Each assisted family was also provided with a latrine, improving Goma's pre-eruption sanitation.

Photo: Graham Saunders

Logistics and materials

Materials were sourced locally where possible. A joint agreement between agencies to share supplier lists and agree on the materials to be provided reduced inter-agency competition and local price inflation.

The possibility of setting up a local timber mill was considered but not implemented. Lack of capacity at the local mills meant that some timber was procured from outside of Goma.

Modification

By October, many had made improvements to their homes, often using salvaged corrugated metal sheeting or timber cladding to replace the plastic sheet walls. However, around 30% of the families felt they could not afford to make these upgrades and would be living in the transitional shelter as provided for some time.

Some enterprising beneficiaries made design modifications. For example, one family paid a contractor to build a kiosk into one end of the house in order to run a small business to raise money for new furniture.

Disaster Risk Reduction (DRR)

This shelter programme was implemented alongside a DRR project to support the Goma Volcano Observatory's hazard monitoring and a community-based early warning system.

A.2 Eritrea - 1998 onwards - Conflict

Camp upgrades

Project type:
Non-food item distribution
Camp support programme
Fuel-efficient stove project

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

No. of houses damaged/people displaced:
Around 1 million people displaced in 2001
An estimated 100,000 homes destroyed in the war

Project target population:
Target population varied over time
Camp population in the Gash-Barka, Debub and Red Sea states regions stabilised to 60,000 people by 2001

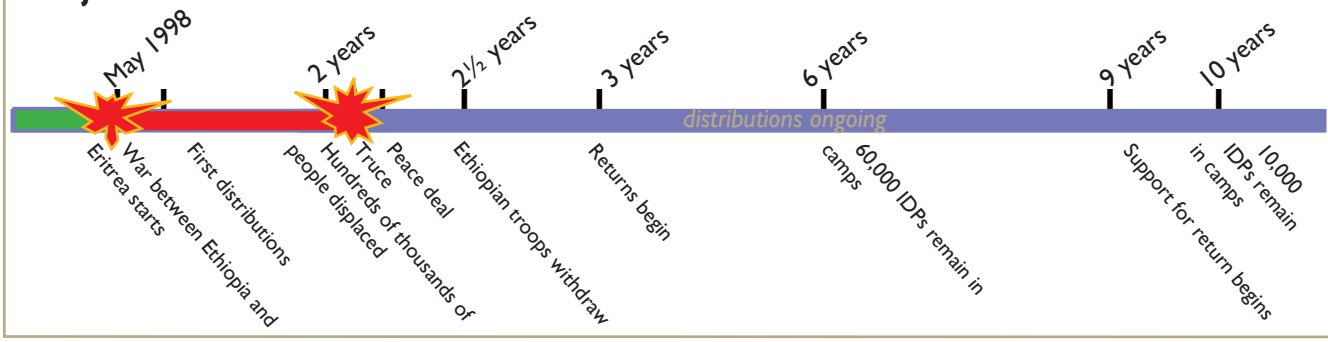
Occupancy rate on handover:
Occupancy of camps varied over time

Shelter size
Tents provided 16m^2 of covered space. Some families had modified their shelters to provide up to 40m^2 for larger families.

Summary

Support for a variable population of Eritrean IDPs following the conflict with Ethiopia. The agency in this case study was the main provider of shelter and non-food item (NFI) assistance. They provided IDPs with tents, tarpaulins and other non-food items (such as stoves) to those living in camps in the Gash-Barka, Debub and Red Sea states. The provision of durable shelter items was not possible due to 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.

Project timeline



Strengths and weaknesses

✓ Camp residents were ready to invest time and capital into the improvement of their 'temporary' shelters.

✓ Distributions of tents and plastic sheeting were sufficient to ensure a basic minimum of covered space for IDPs.

✓ Fuel-efficient stove distribution reduced deforestation problems.

- IDPs created shelters that looked more like the homes that they had been displaced from than the tents that they had been given.

× Shelter options were limited by camps having to remain 'temporary', as authorities wished to avoid making the camps permanent.

× The inability to use more durable shelter materials that could have been reused by IDPs meant that emergency funds were used to replace worn-out shelters.

× Initial fuelwood consumption was so high that it caused deforestation in the local area and led to conflict over fuelwood with the local population.

× Although IDPs used their own initiative to upgrade their shelters, the designs required cutting down larger trees in an unmanaged way in order to obtain high quality timber.

Traditional hudno house with earthen roof

Over 60,000 people were living in tent camps six years after the outbreak of conflict.

Situation before emergency

Eritrea is one of the poorest countries in the world, with more than 50% of its population living below the national poverty line of $1/day. In the conflict-affected areas, people lived mainly in soil-block homes, in stone-constructed homes with heavy earthen roofs or in lighter-weight thatched round huts.

After Eritrea's independence from Ethiopia in 1993 the border between the two countries was disputed. In May 1998 the dispute escalated into war, displacing thousands from their homes in the disputed areas.

After the emergency

As a result of the fighting, thousands of people left the disputed border area. Both countries also deported around 70,000 citizens. Settlements, including about 20 designated camps, were formed in the states of Gash-Barka, Debub and Red Sea. These were intended to be temporary and to house no more than 20,000 people on each site. Other people stayed with family members or rented accommodation. Many IDPs attempted to continue agricultural activities on their land while remaining displaced.

By June 2000 as many as 1 million people were displaced within Eritrea, though this figure fell sharply later that year to around 200,000 people in camps and 100,000 outside of camps.

Six years after the outbreak of the conflict, around 60,000 IDPs remained displaced. These people were either from disputed border areas, from the Ethiopian side of the border or had been prevented from returning to their land as a result of landmines.

Ten years after the outbreak of conflict 10,000 people remain displaced.

Technical solutions

The official policy was that camps were temporary and that the displaced population would be returning home soon after the peace treaty. This meant that organisations were discouraged from providing more durable shelter solutions. However, the slow diplomatic resolution of the border demarcation and the need to properly demine return areas meant that ten years after their initial displacement some IDPs remained in camps and received only emergency shelter items.

Tents and plastic sheeting formed the core of the shelter response. Due to the short lifespan of such materials, many tents that had rotted, blown away or caught fire had to be replaced during the period of displacement.

There were trials with other materials. In 2001 the organisation distributed palm leaves for the repair of over 1,000 traditional homes in and around Barentu, in the Gash-Barka region. These were very bulky to transport. In 2004, woven mats were produced for one camp to provide a more traditional shelter material, but this was not extended to other camps.

With IDPs living in camps for much longer than expected, additional pressure was placed on natural resources in the area. IDPs and the host community were soon competing for scarce firewood and large areas of land near the camps were deforested.

Palm leaves were distributed to 1,000 families.

In 2002, the organisation began the distribution of fuel-efficient stoves and kerosene stoves, significantly decreasing the demand for fuel wood by IDPs.

Firewood collection led to serious conflict with the host community. Because traditional stoves were not very efficient, an improved stoves project was set up.

Implementation

Distributions of shelter items were made in coordination with the governmental Eritrean Relief and Refugee Commission.

After a mass distribution of 15,254 tents in 2000 when the total population in camps reached around 150,000 people, all camp residents were assessed as having their basic shelter needs met.

However, nearly 4,000 replacement tents were required between 2003 and 2007. This redistribution of basic emergency shelter items was enough to rehouse nearly half of the total camp population of around 63,000 people. Considerable quantities of plastic tarpaulins were also distributed, although as some of these were distributed to returnees an exact figure for camp residents is difficult to obtain.

The table shows the distribution of tents and tarpaulins. UN agencies and other NGOs were also supporting IDPs with emergency shelter items in the early period of displacement, but by 2002 the agency was responsible for shelter provision in the camps.

Year	Number of IDPs	Tents distributed	Plastic tarpaulins distributed
1999	30,000	4,207	2,000
2000	150,000	15,254	
2001	65,000		
2002	63,000		
2003	63,000	3,406	11,471
2004	63,000	6	20,547
2005	46,500		No figures (approx. 5,000 to returnees)
2006			
2007	10,000		No figures (approx 30,000 to returnees)
Total		Minimum of 22,873	Minimum of 34,018

* Where there is no data, cells are left blank.

People adapted their tents in many ways.

Adaptations by IDPs

An assessment made in 2002 revealed that many beneficiaries had made significant modifications to their shelters for two main reasons: emergency shelter items provided too little covered space and had too short a lifespan.

a) Space

The standard relief tent provides only 16m^2 of covered space (enough for a family of four people with 3.5m^2 per person) and many large families felt that they were living in overcrowded conditions. By modifying their shelters some IDPs managed to increase their covered floor space to around 40m^2 and to also ensure that they could stand up in them, something only possible in the middle of the tents.

While a standard ridge tent may have walls of 80cm in height when erected with long guy ropes, tents in the camp were pitched with shorter ropes in order to save rope for other uses and to decrease the footprint of the tent. Shortening the guy ropes meant that the wall height shrunk to around 30cm, reducing the internal volume of the tent considerably.

People upgraded their tents using local materials to provide more head room.

b) Quality of materials

Weather conditions in this part of Eritrea included extreme heat during the day, cold at night, considerable dust and strong winds. Not all the shelter materials distributed were of the right specification to deal with these conditions. Tent canvas lifespan varied from four years to just six months. This variation can be explained by different shipments, with some tents provided from emergency stocks, some ordered new and some donated. Some canvas samples could be torn by hand after less than a year. Plastic sheeting often ripped in the wind, partly due to poor fixing techniques and a lack of suitable rope.

Many of the camp residents in the Gash-Barka region had previously lived in houses called hudnos. These houses had heavy roofs and thick walls, which kept interiors cool during the hot day and warm during the night.

The roof of a hudno uses a lot of wood - the roof frame is covered by more wood with a layer of mud on top. The walls are generally made of stone, often using mud as mortar.

Though the high consumption of wood and the impossibility of transporting stone ruled out hudno construction in the camps, many people adapted their temporary shelters to look and act more like the homes from which they had been displaced. Camp residents in Gash-Barka made the following modifications:

Structure: IDPs extended the height and floor space of their shelters by building large wooden frames and hanging tents and other material over the top.

The wooden frame was constructed from logs up to three metres long. The logs were cut down locally or purchased by the IDPs themselves. The frames were not particularly efficient in the use of timber, consuming around 200kg of wood for a family shelter with considerable structural redundancy.

Roofing: Layers of tent canvas, plastic sheeting, grain sacks and straw mats were used as roofing materials. For those IDPs who did not possess a tent, plastic sheeting was used as an outer layer with other available materials placed over the top to prevent plastic sheeting from degrading in strong sunlight.

Walls: External walls were made of the same material as the roofing. Inside the shelters, a 'wall' around 20cm high was built up around the edge using donkey dung or mud. The walls were used as benches or beds and also provided some protection against rain.

Partitions: Partitioned interior space was created by hanging material over timber frames. Some families also created separate areas for storing straw for animal feed.

A fly sheet separated from an inner tent and covered with plastic is used to form an extension. Sticks were used to raise the sides to increase the internal volume.

A.3 Kenya - 2007- Flooding

Shelter and disaster mitigation

Project type:
Construction of self-build new shelters for refugees
Community mobilisation, disaster mitigation

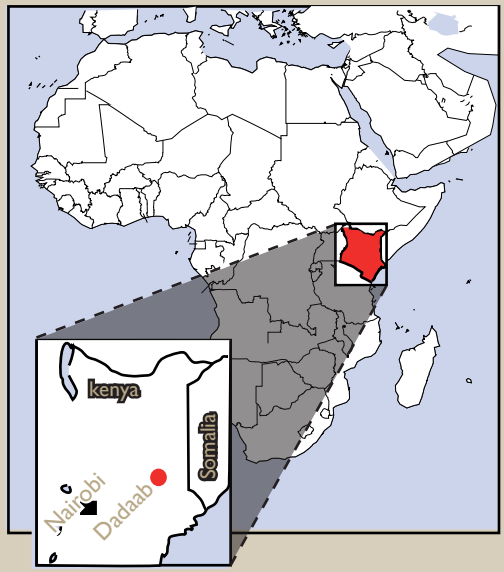
Disaster:
Ifo refugee camp flood response, Dadaab, Kenya, 2007

No. of people displaced:
Approximately 6,000 households displaced, mostly from the Ifo camp

Project target population:
500 households in the Ifo camp

Occupancy rate on handover:
100% (based on visual assessment)

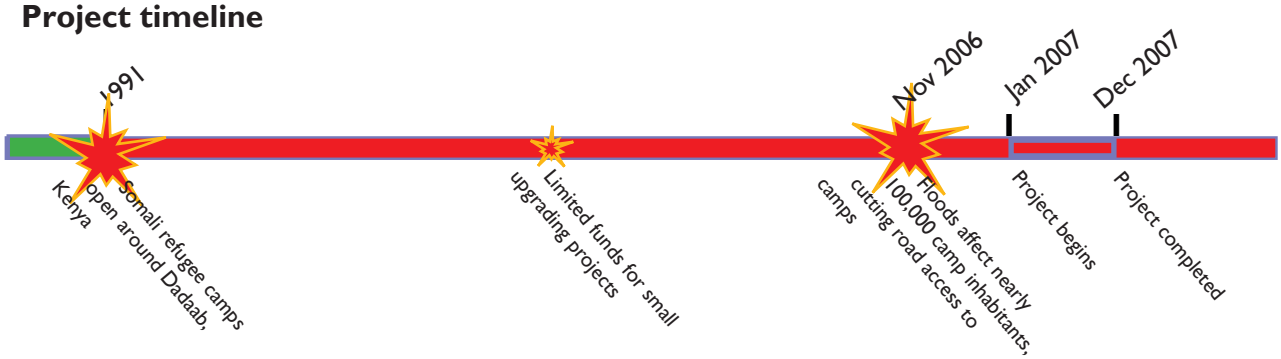
Shelter size
18m² (6m x 3m)



Summary

Through a combination of upgrading and emergency response funding, 500 families were assisted in making bricks and building shelters through a community-based construction programme following flooding in a large refugee camp.

Project timeline



Strengths and weaknesses

✓ Strong community participation through the training of beneficiaries to construct their own shelters meant project costs were low and construction standards were high.

✓ A sense of ownership and pride in their shelters was demonstrated by the wide variety of self-implemented modifications, raising living conditions.

✓ Mud brick production has become a major income-generating activity even though the project has finished.

✓ Deforestation in the Dadaab area was reduced by replacing stick walls with mud bricks.

✓ The use of a thick foundation and lower wall reduces the possibility of collapse in heavy rains.

✓ Broken bricks were recycled to demarcate plots, build furniture or were remixed with water to be remoulded.

× Soil quality was variable outside of the camp, so many used soil from their own plots. This created hazardous holes that may create mosquito breeding grounds. Sourcing soil from outside the camp required negotiations with the host community to avoid conflict.

× Water consumption was high. Water meant for domestic consumption was used in brick production. Rainwater catchment systems will help to avoid this in the future.

× Though foundations increase the structure's strength, they can still degrade through contact with water. Stabilising the soil with cement will help to make them stronger.

× The inclusion of people from minority groups, such as the disabled, was not fully realised.

- The agency needs to use the refugee initiatives that emerged from this project to help redesign its strategy. Supporting livelihood activities may accelerate the construction pace and decrease costs.

- Opportunities for income-generation activities and broad environmental concerns require joint agency solutions. This kind of shelter project requires coordination

Village constructed through community-based project

Brick production

Situation before emergency

Three refugee camps (Ifo, Hagadera and Dagahaley) sheltering mainly Somali refugees were established close to the town of Dadaab, in Northern Kenya, in 1991 and 1992. By 2007 they had a population of around 173,000 people.

Dadaab is an area with little vegetation and refugees' access to natural resources (including building materials) is limited. The government of Kenya does not encourage activities that are 'permanent', so refugees rely on aid agency support rather than self-sufficiency through agriculture or other livelihoods.

The camps are highly congested, creating sanitation problems and fire safety issues. The majority of shelters in the camp are of two types, both employing highly flammable roofing materials: traditional tukuls – 3.5m diameter dome structures made of wooden sticks, covered in fabric; and adobe huts – 6m x 3m shelters using a large number of sticks for walls with a roof made of local vegetation.

After the emergency

The severe flooding in the Ifo camp destroyed over 2,000 shelters and left more than 10,000 people homeless. This meant that many refugees had to move to a new camp neighbourhood, 'Section N'.

Section N was not a popular choice for many refugees. Although the ground was higher and less affected by floods, the site was further away from the market and its lack of trees meant little natural shade.

Selection of beneficiaries

Beneficiaries had been preselected by a UN agency, following standard vulnerability criteria that was verified through door-to-door checks.

Implementation

The agency faced two main challenges: convincing refugees that Section N could become a nice place to live and that improved mud-brick constructions would be stronger than the previous buildings that the refugees had seen washed away.

It was decided that the agency would follow the idea of previous shelter programmes in building mud-brick houses, but would improve the durability of the design, increase the involvement of the communities and reduce the need to pay beneficiaries for construction.

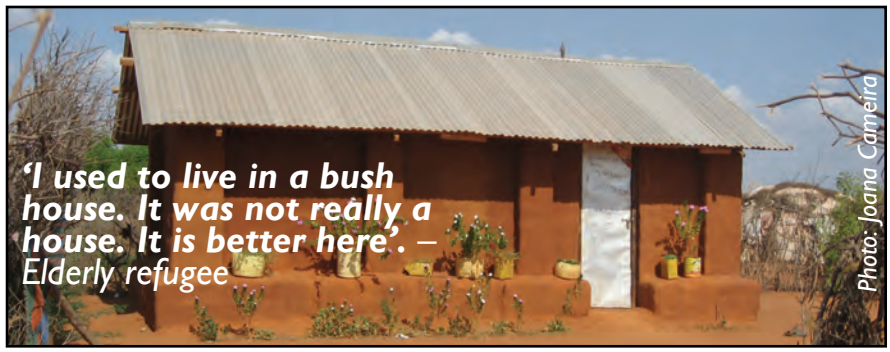
The aims of the programme and the implementation of the strategy were explained to camp leaders who disseminated the information. As well, community mobilisers (agency staff who were based in the blocks for eight hours per day) ensured that the right information was reaching everybody.

A public demonstration of 'brick throwing' to test the strength of bricks made from different soils ignited the interest of potential beneficiaries and addressed the fears of mud-brick houses being weak. The agency constructed some prototype shelters that were then used as classrooms for the construction trainees.

The agency then provided a 'training of trainers' to a small group of refugees on construction techniques and brick-making. Efforts were made to ensure

that training teams included women and the elderly. Each trainer supervised around four families per month, assisting them with layout, foundations, walling and plastering. Carpenters were deployed to give technical support on roof and latrine construction.

'It was my first job! It allowed me to support my family'. *– Female refugee construction trainer*



Completed house

Soil-sourcing sites, both within and outside of the camp, were identified by the agency, which also supplied brick moulds, pangas (knives), wheelbarrows and plastic sheeting to cover completed bricks during the rain. Tools were shared among the community groups and returned to the agency when not in use. Water storage was provided near the soil-sourcing sites.

Agency staff maintained quality-control checks on all the constructions to ensure the safety of the houses, particularly as previous mud brick failures had been mostly due to poor construction rather than design.

Upon completion of the mud-brick structures, the agency supplied the construction materials that the beneficiaries could not produce or purchase themselves, such as roofing sheets and doors.

The combination of a team of trainers able to transfer skills to the community and beneficiaries willing to participate in the construction of their own shelter at no cost led to full engagement of the community and guaranteed that people would maintain their properties themselves.

Technical solutions

The 6m x 3m houses required 1,700 bricks, considerably more than previous designs implemented in the camp. While disaster mitigation was primarily achieved by relocating refugees to the higher ground of Section N, extra bricks were necessary to build a thick foundation and lower wall to improve the structure's performance in heavy rains.

Eight pillars provided support for the walls and roof trusses, increasing the stability of the roof itself. Mud-brick walls were plastered with mortar or cow dung and the roof was covered with iron sheeting. Improvements were made to ventilation to decrease the high internal temperature of previous designs.

A change in the position of the house on the plot improved sanitation. Latrines were moved to the front of the plot next to the street and the house was positioned at the back of the plot. This left space for more construction inside the plot and prevented the problems of a dirty backyard blocked by wastewater runoff.

Beneficiary modifications

Beneficiaries made a number of modifications to the new structures. These included:

- Aesthetic: Painting and decorating.
- Windows: The size was adjusted. Sometimes they were partially closed with other bricks or sticks to increase security and reduce sunlight but maintain ventilation.
- Furniture: Some families constructed beds and tables out of the mud bricks, which helped to demarcate the internal living space.
- Plot boundary: Small walls to define the extent of a plot were often built with spare or broken bricks.
- Plastering: Some families plastered their house with cement mix, making the walls impermeable.
- Gutters were made out of waste tin sheet and tin cans.
- Livelihoods: Market stalls were built as extensions onto or between houses, increasing the income of the families and providing more options for other residents to shop locally.

About 30% of the beneficiaries employed other refugees at some stage of the construction. This increased the income generated in the housing industry in the camp. Such initiatives inspired the agency to look into the next stages of the implementation strategy, to increase the supply at lower costs and in a shorter timeframe.

Logistics and materials

Families originally used soil from planned and unplanned areas within the camp. A project to dig new garbage pits outside the camp presented an opportunity for a new soil source.

To reduce the water consumption necessary for brick production, 'spilled water' from tap stands was collected. The rest of the water was supplied by truck and stored in oil drums distributed around Section N or in water tanks if the bricks were being produced outside the camp.

Roofing and door materials were procured in the capital with support from a UN agency, while other materials were procured in the nearest large town.

The total cost of materials, including transport, was around US$ 440 if the soil was sourced within the camp, rising to US$ 480 if soil was sourced outside the camp. Labour costs for each shelter were around US$ 30.

Quantity	Unit
Iron sheets (2.5m length)	20 pieces
Timber - cypress (2mx2m)	120 m
Plain sheet (2.4m x 1.2m)	1 piece
Nails 4"	4 kg
Nails 3"	1 kg
Nails 1"	0.5 kg
Roofing nails	5 kg
Butt hinges 4"	3 pieces
Padbolt 6"	1 piece
Tower bolt	1 piece
GI Ridges (1.8m length)	4 pieces
Binding wire	5 kg
Wood preservative	8 l

A.4 Kenya - 2007-2008 - Election violence

Transitional shelter kits

Project type:
Pilot project providing transitional shelter kits
Technical support for building
Full construction for vulnerable households

Emergency:
Kenyan election crisis, 2007-2008

No. of people displaced:
125,000 - 250,000 IDPs found shelter in camps and similar settlements during the violence. An estimated 300,000 moved in with relatives or friends and around 12,000 fled to Uganda.

Project target population:
481 transitional shelter kits provided as a pilot project (226 erected by the agency, 255 self-built)

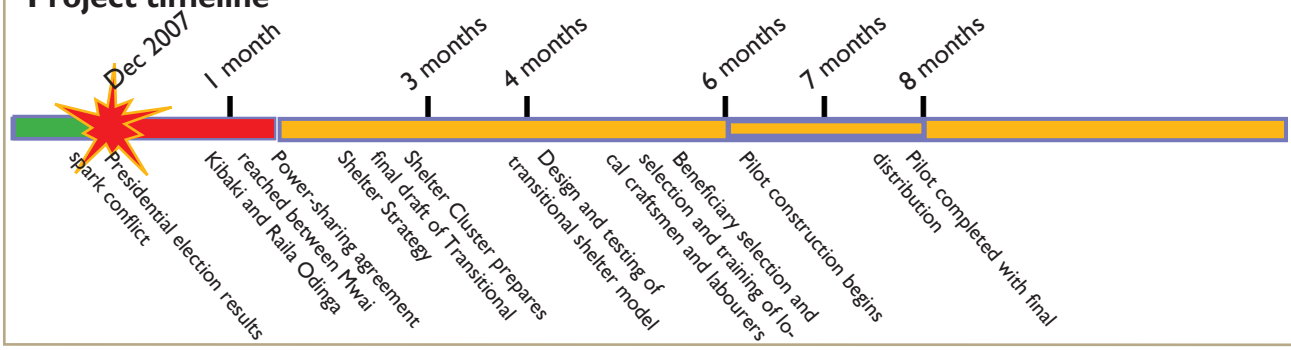
Occupancy rate on handover:
86% - Those not occupying shelters wanted to wait until the shelter had been upgraded with stronger walls or until other family members returned. Both reasons related to ongoing feelings of insecurity.

Shelter size
18 m^2 (extendable, modular construction)

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.

Project timeline



Strengths and weaknesses

✓ Only viable project sites were selected, based on the security guarantees of the local administration, existence of peacebuilding initiatives and willingness of IDPs to return.

✓ Because it used local building technologies and local craftsmen's knowledge, the design was readily accepted by the beneficiaries and easily built.

✓ Having construction teams of mixed ethnicity contributed to the peacebuilding process in an unplanned but positive way.

✓ Consideration was given to how the shelters could be upgraded in the future to permanent homes. This maximised the impact of the financial investment.

✓ Use of robust building components meant the shelters could be relocated. Some beneficiaries used plastic spacers when nailing the roof to make disassembly easier.

✓ Close involvement of the community and local administration in beneficiary selection meant that distributions ran smoothly and disputes were resolved.

✓ Linking the project with livelihoods interventions

Strengths and weaknesses (continued)

promoted sustainable return.

× Occupancy was not as high as hoped for, with some IDPs not ready to move back.

× Not all of the materials are available locally in sufficient quantities. Sourcing of materials needs to be reconsidered before the project can be upscaled.

× Only those whose houses had been completely destroyed received the kit. Further attention needs to be given to those whose houses are partly damaged, as many roofs and doors had been looted.

× The kit included spare sheets and plastic sheeting for the construction of latrines. These materials were often used to extend the roof instead.

× Some beneficiaries stated that they would have preferred to have been given the cash value of the plastic so that they could buy local materials themselves to build the walls (cash grants are being considered for the post-pilot phase).

Transitional shelter built on the family's own land

Situation before emergency

A number of the tensions related to the ethnic nature of political affiliation in Kenya, unresolved land issues, inequality of wealth distribution, high unemployment and conflict over natural resources led to violence following the December 2007 election.

The majority of those displaced from the Rift Valley province had lived in small timber pole-framed houses with timber or adobe wall cladding, thatch or iron-sheet roofs and compacted soil floors, strengthened with dung or cement.

After the emergency

The election crisis was compounded in April by food security problems, flooding in some areas and drought in the north. The pattern of displacement was complex. People were displaced from many different parts of the country as one ethnic group escaped the threat of violence from another.

Around half of IDPs found shelter in camps. The rest sought refuge with friends or relatives and some moved back to their 'ancestral' land where support services were limited.

A response plan was developed through the Cluster System, which would provide non-food items and tents to meet the need for emergency shelter while a transitional shelter design was developed to bridge the emergency and permanent shelter phases.

Selection of beneficiaries

The Shelter Cluster agreed that 481 transitional shelter kits would be distributed as a pilot project to test the design of the shelter and the response of beneficiaries.

It was important that the site chosen should be one where security was good, IDPs were willing to return to and the community they were returning to was ready to accept them. Mtaragon, in the Kipkelion District, fit the requirements.

The local administration had a record of all IDPs. Their assessment of the impact of the violence, correlated with the agency's own assessment, showed that around 500 houses had been completely destroyed.

The following criteria were used to decide which of the 500 households who had no shelter to return to would be chosen to receive a kit. The selected beneficiaries:

- were registered as an IDP by the local administration;
- were willing and ready to return;
- had proof of land ownership.

Proof of land ownership was only required for this pilot project. It was anticipated that an appropriate response would later be developed by the Shelter Cluster to deal with those without formal titles to their property or whose houses were only partially damaged.

An ad hoc beneficiary selection committee was established by the local administration, with appropriate representation of women and IDPs, to select the final beneficiaries. This committee was monitored by the implementing agency.

The degree of vulnerability of the households was also assessed and was intended to be used as another filter in beneficiary selection. But as the number of shelters to be provided almost matched the number of houses completely destroyed, vulnerability criteria was used to determine the level of construction assistance a household required, rather than to select the beneficiaries themselves.

To qualify for construction assistance, the household had to be headed by a single parent or a child or have members who were elderly, disabled or had special health requirements.

The criteria for the upscaled project was modified from the Shelter Cluster's Transitional Shelter Strategy developed in March 2008, following feedback from the pilot project.

Implementation

A prototype of the shelter was tested for structural quality and reviewed by IDPs for its suitability. At the same time as the final selection of beneficiaries was being made, a second prototype was built in a prominent

location in Mtaragon to sensitize beneficiaries as to what was being provided and to get feedback on the design.

Local craftsmen and unskilled labourers were recruited into ten teams and trained. Although not planned, the teams were a 50-50 mix from the ethnic group that had fled and the ethnic group that they felt threatened by. This side effect of the project had a positive impact on peacebuilding. The donor organisation directly procured the materials within Kenya and delivered them to the implementing agency's warehouse in Nakuru.

The implementing agency then distributed the materials at three locations. Beneficiaries collected them and took them to their plots up to three kilometres away, using their own transportation (either by hand, by donkey, or by tractor and trailer).

The kits also included the basic tools necessary to build the shelter.

'I'm over 60 and unable to get the materials to build on my own. Despite what happened, I have to continue staying here. Being my land I cannot run away. If everybody can be assisted in the way I was, that would be great. Plastic sheeting is OK, but I would have preferred timber, as it's stronger and can't be blown away'.- *Beneficiary*

Guidance was given by the local craftsmen on how to put the shelter together. The beneficiaries provided the labour themselves and the houses were normally completed within one or two days.

Over 45% of the beneficiaries met the vulnerability criteria and qualified to have their houses built by the construction teams.

Technical solutions

The structure had a covered space of 18m^2 (6m x 3m), was split into two rooms, and had good clearance above head height.

The frame was made up of 10cm diameter cedar poles, dug into the ground at a depth of around 60cm. The poles supported a timber ring beam, which in turn supported the timber rafters onto which an iron sheet was nailed.

Walls were clad in plastic sheeting and floors were compressed earth. The doors were flaps in the plastic sheeting and weighted with timber battens.

The design was based on the vernacular housing typically lived in by IDPs prior to their displacement. This enabled IDPs to upgrade their shelters incrementally using materials and methods that they were already familiar with. The walls could be clad with timber, adobe or even brick and cement. Cement could be used to increase the durability of the floor.

The use of plastic sheeting allowed shelters to be built and occupied very quickly, though some beneficiaries replaced the plastic sheeting walls immediately with adobe or reclaimed building parts, such as doors or timber. The plastic sheeting could then be sold or used for temporary house extensions, and provided waterproof storage for seeds and fertilisers.

The use of regular frame and roof sections made the construction modular – it could be easily extended or adapted. The choice of materials meant that there was no part of the building that could not be fixed or replaced locally.

Most beneficiaries erected their shelters on exactly the same site as their previous homes had been, so little site clearance or ground levelling was required.

Logistics and materials

Materials were sourced in Kenya, and chosen for their familiarity, durability and low cost. Timber was supplied by private forestries who were only considered if they had government-approved replanting projects in place. Plastic sheeting was made from recycled plastic. The total cost of materials and labour for one transitional shelter was US$ 350, not including transport and agency administrative costs.

Materials	Quantity
Walls	
Cedar posts 9', 4" diameter	14 units
Walling-polythene sheeting-1000g	45 m^2
Cypres timber 2x3", 6 x 2m, 3 x 2m	20 m
Ordinary nails 4"	2 kg
Roof	
Cypess timber 2x3", 2 x 10m, 3 x 3m, 1 x 8m	40 m
Cypes timber 2x2" 6.5 x 6m	41 m
CGI ridge covers-30g -1.5 m	4 units
CGI sheets-30g 2 x 0.9m	20 units
Ordinary nails, 2kg 4", 2kg 3", ½kg 2"	4.5 kg
Roofing nails	4 kg
Iron hoop	1 kg
Tools	
Stanely claw hammer	1 unit
Stanley woodcutting saw	1 unit
Panga knife	1 unit
Hoe and handle	1 unit
Manaila thread 30m (roll)	1 unit
Measuring tape	1 unit

'The prototypes built by local craftsmen in each project location enabled structures to be tested and important feedback from builders and beneficiaries to be incorporated into the final design.' – *Engineering coordinator*

Transportation

A.5 Liberia- 2007- IDPs, refugees

Self-build shelters

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

Emergency:
Liberian returnees, 2007

No. of houses damaged/people displaced:
A 2005 needs assessment estimated 80% of the housing stock was damaged. In total, around 500,000 of Liberia's population of 3 million had been displaced by civil war.

Project target population:
500 individual shelters in Cape Mount, Bomi and Gbarpolu counties, benefitting 1,328 beneficiaries. Post-completion, a total of 1,782 people were living in the houses as family members and lodgers moved in.

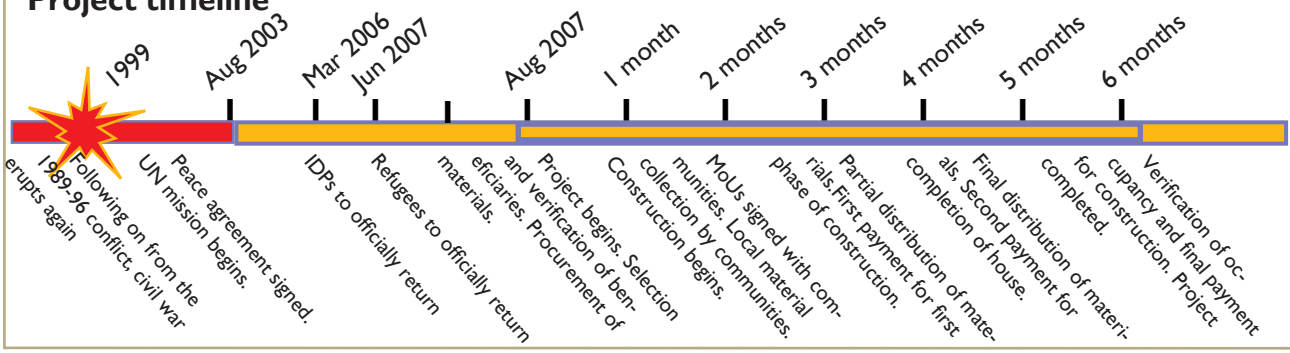
Occupancy rate on handover:
100%

Shelter size
25m² (5m x 5m)

Summary

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

Project timeline



Strengths and weaknesses

✓ Selecting beneficiaries in collaboration with the community ensured community cooperation.

✓ Close partnership with local authorities through several initial open meetings meant that what was and was not covered by the project was clearly understood.

✓ A good balance between community decision-making and quality control was achieved through close monitoring of the project by the agency. This helped to minimise corruption.

✓ Learning from previous projects, enough supervisors were employed to ensure that they had a face-to-face meeting with each beneficiary once a week.

✓ Paying for materials and labour only after the materials had been used in construction and the beneficiary had moved in ensured work was completed on time and that the right people benefited.

✓ Using a local design meant that local people knew what they wanted to build and how to build it.

Strengths and weaknesses (continued)

- The project ran alongside water and sanitation and education programs, which was necessary to ensure that people had access to the services they needed in order to resettle.
- The construction of shelters for vulnerable beneficiaries appeared to inspire other returnees to begin rebuilding spontaneously, as it created a positive atmosphere of recovery.
- The project was better suited to a rural context than an urban one, as community mobilisation was much easier in smaller villages where the benefits to the whole community could be more clearly seen.

× Maintenance issues could have been considered further, with many beneficiaries asking for cement for flooring and walls.

× Technical supervision could have been more intensive from the beginning, as some construction work had to be rectified.

× Donor-driven partnerships with community-based organisations from previous projects had to be dropped due to corruption and a lack of community involvement.

Completed houses for returnees

Situation before emergency

After years of civil war, many of Liberia's 3 million inhabitants had been displaced within or outside of the country. Between 2004 and 2007, 327,000 IDPs were assisted in a returns process, leaving an estimated 23,000 in camps. Over 110,000 refugees returned at the same time. Around 90,000 Liberian refugees remain outside of Liberia, making the total figure of those displaced over half a million.

It is estimated that the number of people living on less than one dollar per day rose from 55% in 1997 to 80% in 2007. As well, the sanitation and nutrition conditions of the early 1990s had seriously deteriorated by 2004.

After the emergency

The vast majority of returnees did not have appropriate shelter when they returned, due to their houses being destroyed or simply deteriorating during the two civil wars.

In rural forested areas, building traditional shelters required families to collect materials and provide the labour to rebuild. While some support was provided for rebuilding (such as this project), most returnees' shelter assistance did not extend beyond the standard repatriation package (sleeping mat, blanket, cooking kit, food and transportation) issued in the return-transit camp.

Selection of beneficiaries

Using the opportunity of a routine check of returnee names, the agency made notes of those living in overcrowded shelters and poor conditions before communities were aware of a proposed shelter programme. This eliminated the temptation for people to temporarily overcrowd their shelters on assessment day. By correlating this information with a joint UN/NGO monitoring project to establish vulnerability categories (including female-headed households, unaccompanied minors, the chronically ill and physically disabled) the agency was able to draw up a shortlist of potential beneficiaries.

The final selection of 500 beneficiaries was carried out by the agency, in collaboration with local authorities and community representatives, after several visits and open meetings. Three-way Memorandums of Understanding, describing the assistance given and the criteria for beneficiary selection, were prepared and signed by beneficiaries, community leaders, and agency representatives.

Technical solutions

The traditional house design is a bush pole-framed, mud-walled construction with a thatched roof of grass or palm leaves. The project improved the design to include a corrugated iron roof, which reduced the need to maintain a thatch roof, and a stronger central pole to improve structural stability.

Many local houses do not have closable doors and windows, and walls and floors have to be frequently repaired after damage from the elements. As vulnerable beneficiaries were unlikely to be able to undertake much maintenance themselves, doors and windows were included in the build.

'I now have a good place to stay, and my family will come to stay with me in my new home'.
– Beneficiary

Traditional shelters under construction

The doors and windows originally produced by each local construction gang were found to be of inconsistent size and quality, so it was decided to prefabricate these components in the NGO's compound using skilled workers.

Implementation

Once beneficiaries had been selected and cooperation of the community was agreed upon through a series of open meetings, a skilled local carpenter was chosen to lead the construction of between one and three houses. The carpenter would also act as a community mobiliser to organise people to collect materials and provide labour for construction.

Progress was monitored by one of five shelter supervisors, all of whom had construction knowledge and skills. The supervisors were managed by a shelter coordinator and a project director.

Supervisors were expected to visit each beneficiary at least once a week. The coordinator usually visited sites four days a week. Such close and direct monitoring was a key reason for the project's success, as problems were identified and resolved quickly and the quality of building could be examined throughout the project. This enabled ongoing improvements to be made.

The NGO paid US$ 40 for the materials collected to build the house and US$ 40 for the labour. This was not a salary, but an incentive. The community decided who would benefit from the money; normally it was used to pay for the food of those who provided labour.

The sum was large enough to be an incentive to get people involved, but small enough to prevent conflict over who benefited. The US$ 40 for the materials was only paid once construction up to the roof was completed.

Payment of the final US$ 40 was made upon occupancy rather than when the structure was completed. This was a lesson learned from previous projects, where payment had been made upon structural completion. The NGO was then unable to prevent occupancy of the structures by non-beneficiaries afterwards.

Shelter supervisors marked out the agreed 25m^2. A standard design was proposed for a two-room construction with a veranda. However, beneficiaries were free to alter this design according to their needs. The NGO felt it necessary to make further stipulations about central support poles, to ensure that the building was safe once the project was underway.

The project was completed on time with a 100% occupancy rate.

Land issues

The community allocated the land themselves. This was easy in rural areas and small communities, where there was no pressure on land. In more densely populated communities (though not urban) land had a price. In these areas the NGO had to check the site selection as there was a temptation to allocate land to vulnerable beneficiaries that was inappropriate for building. This was solved through joint meetings with the local authorities and community representatives.

Logistics and materials

Materials were collected locally, apart from doors and windows. It was not thought that environmental damage would be caused by local collection. The total cost of materials for each shelter was US$ 320 (US$ 240 for imported materials, US$ 40 for local materials bought from communities, and US$ 40 for labour provided by the community).

Completed house

Materials	Quantity
3" nails	65 (0.3kg)
4" nails	28 (0.3kg)
Hammer	1
Zinc roofing sheets (0.66m x 2.4m)	2 bundles
Zinc nails	1.5 packets
Door and frame	2
Window and frame	2
Hinges	4 pairs
Nails	115 (0.3kg)
Hasp/staples	4 pairs
Window and door bolts	4 pieces
Roofing felt	1 piece
Materials collected locally:	
Central pole	1
Poles for frame	Around 160
Rafters (poles)	50
Bamboo/rope for ceiling mats	As required

A.6 Mozambique- 2007- Cyclone

Shelter material packages and training

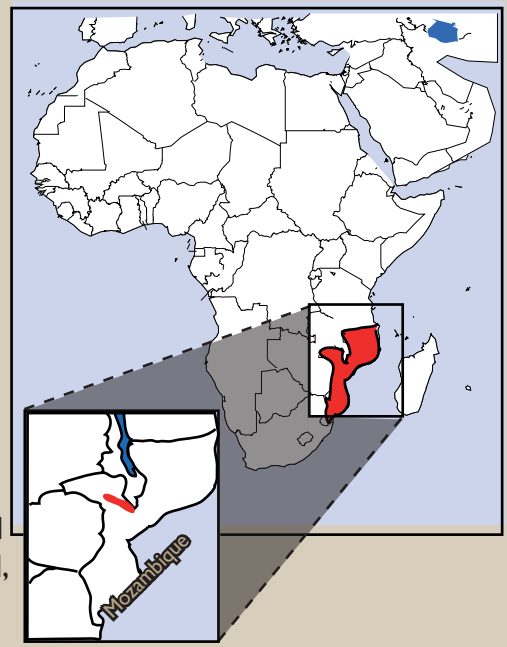
Project type:
Distribution of shelter construction material packages
Training on improved building techniques

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

No. of houses damaged/people displaced:
160,000 people displaced by flooding
Approximately 6,500 houses damaged by the cyclone

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, a visual assessment suggested around 95% of the people living in the rebuilt houses were the original beneficiaries.

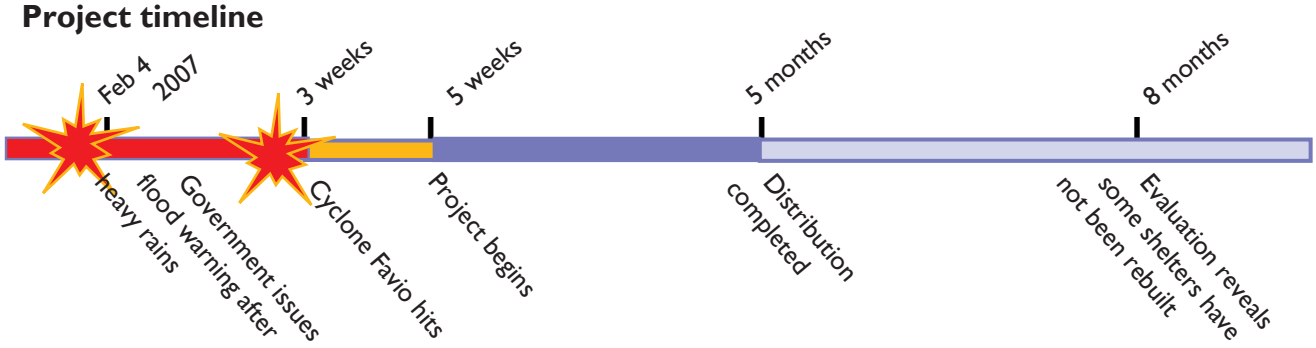


Shelter size
Around 12m² (varied by design and whether the structure had been rebuilt or repaired)

Summary

Despite having 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 affected by the cyclone (child-headed households, widows, the chronically ill, handicapped, etc.) in two districts.

Project timeline



Strengths and weaknesses

✓ Local purchase of items helped to stimulate the local economy.
✓ The most vulnerable beneficiaries were targeted.
✓ Cooperation with local government minimised potential fraud and coordination with the national government.
✓ Community mobilisation and the voucher system were key to ensuring smooth distributions and crowd control.
× Procurement was difficult. Environmental issues regarding building poles proved particularly problematic.
× The assumption that all vulnerable households would receive support from relatives or the community proved wrong. Three months after the distribution had been made, 15% of beneficiaries were not able to use the distributed materials for rebuilding. In the future the agency would pay for construction or mobilise community groups.
× Given the vulnerability, and in some cases, social isolation of the extremely vulnerable, they often needed the help of several people to transport the items from the distribution site to their house.
× Lack of a stockpile of emergency shelter materials, such as plastic sheeting, and a delay in securing emergency

Strengths and weaknesses (continued)

funding meant that some beneficiaries did not have support for basic shelter needs for at least three weeks.

× Technical advice was not always implemented by the beneficiaries. Although beneficiaries attended the training, the construction may have been carried out by someone else or they had not been convinced by the advice. This required repetition of the messages.

× Local suppliers were sometimes unable to meet deadlines. This resulted in the project requiring an extension. Delays were partly due to legal requirements for supplier registration and payment of taxes by suppliers.

A damaged house and self-built reconstructed house using distributed items

Situation before emergency

Many of Mozambique's inhabitants live in floodplains and the country is regularly hit by cyclones. As a result, it has repeatedly required disaster-recovery assistance.

After the emergency

Over 300,000 people were directly affected by the combined effects of the flood and the cyclone. About 140,000 of the displaced sought shelter in communal accommodation, which had been pre-positioned after the 2001 floods. A further 55,000 people began moving to 'resettlement areas' – part of the government's programme to encourage people to resettle on higher ground. Others stayed on their own land, rebuilding where possible.

The government conducted an initial needs assessment and three international agencies were made responsible for delivering the three main needs of water, food and shelter.

The international organisation in this case study had limited local experience of emergency shelter response, as it was mostly involved in development projects and non-shelter emergency responses. With no stockpiles and no immediate funding, the agency was not able to respond with an emergency shelter distribution until after the first two weeks.

The majority of those affected in the area of the agency's operation found shelter with relatives. Many had rebuilt their own shelters within the first two months.

Unable to respond with immediate emergency items, the organisation decided to run a rehabilitation programme, distributing materials for the repair or rebuilding of houses belonging to vulnerable households. The agency participated in the national Shelter Cluster meetings and received a donation of plastic sheeting. This was included as part of the general distribution.

Selection of beneficiaries

The agency supported vulnerable beneficiaries in the districts of Inhassoro and Govuro. These included women-headed households, children, the elderly, the disabled or the chronically ill, and those without resources to rebuild a home that had been completely destroyed.

An initial target was set of 1,300 households (around 6,600 people) who had remained on their own land but had inadequate shelter. This rose to 2,219 vulnerable households (11,095 people) following additional funding.

Assessments of the shelter needs of each of the vulnerable households were made in partnership with the local government. Beneficiary lists were checked and double-checked by the agency and local authorities.

A simple assessment form was developed, illustrated with simple graphics, to enable teams to quickly classify what kind of shelter kit a household would require (see table at the end of this case study).

Five different shelter packages were designed to be distributed depending on the type of home the household had previously had – traditional round houses or rectangular 'mixed' houses built from a mix of traditional and modern materials – and the level of damage suffered.

Technical solutions

Training in simple construction techniques to improve the durability of structures in the event of further cyclones was provided to beneficiaries on the day of distribution.

Agency staff demonstrated the use of improved building techniques on a lived-in house in the village of distribution. Techniques included advice on nailing roofing sheets more securely and using wire doubly crossed over in an x-shape to strengthen joints.

The demonstration lasted a couple of hours and was made before the materials were distributed. A later assessment showed that while many had implemented the techniques, others had not, despite being present at the training. It is not clear if these techniques were not implemented due to habit or due to difficulties in implementing the training.

Hammers and pliers were distributed to groups of beneficiaries whose entire homes had been destroyed.

Implementation

The project began in mid-March after a delay in securing funding. The time during the delay was used to make thorough assessments. By the time the beneficiaries were selected many people who had the resources had already rebuilt. The distribution was completed within five months, including a one-month extension that was required due to the difficulties of procuring locally.

The shelter items were distributed using a voucher system that detailed what kind of shelter package would be received. The voucher system was introduced in order to reduce the fraud and manipulation of beneficiary lists, which the organisation had experienced early on in the project. The voucher system also reduced the time needed to verify beneficiaries on the day of distribution.

The day before distribution, beneficiaries' identities were cross-checked by the agency and authorities. They were given the voucher, information on what time to attend the distribution, and informed that only one other family member should be with them.

The voucher system, coupled with effective cooperation between the organisation and the local authorities, meant that distributions were conducted smoothly. However, the preparation of the vouchers themselves, to avoid counterfeiting, added to the preparation time.

To further reduce crowd management issues at distribution, community mobilisers employed by the organisation led crowds in song to reduce tensions and prevent potential overreaction by authorities, who were quick to beat back crowds with sticks.

	Roof trusses (3)	Zinc roofing sheets (10)	Roofing nails (100)	Metal wire (2kg)	Wall poles (10)	Purlins and rafters (3 bundles)	Plastic sheeting (1 sheet)	Tools (shared between families)
Mixed house (3m x 6m)								
Totally destroyed 	Y	Y	Y	Y	Y			Y
Roof missing 	Y	Y	Y	Y				
Traditional house								
Totally destroyed 				Y	Y	Y	Y	Y
No roof covering 				Y			Y	
No roof structure 				Y		Y	Y	

Although the distribution of items was successful, the organisation overestimated the level of social cohesion. This was a surprise, as their usual work with local associations suggested the existence of a reasonably community-minded attitude among the population that would help those most vulnerable.

'We did not consider all the aspects of construction in terms of labour for the extremely vulnerable and we learned a lot from this project. In Cyclone Jokwe in 2008, we applied the lessons and we are now a lot better prepared for the next disaster'.
– Project manager

An assessment three months after the distribution had been competed showed that 15% of those who had received shelter materials had been unable to use them to rebuild their homes. The vulnerable households either did not have the money to pay someone to rebuild their homes or did not have any relatives willing to do the rebuilding. With everyone struggling after the disaster it appears that people were too occupied with solving their own problems to assist others without additional support.

Although it was recommended that beneficiaries take off the old roofing thatch, attach plastic sheeting underneath and then re-thatch the roof, many people had simply spread the plastic sheeting over the roof as they did not have sufficient labour to carry out this very physical task. Consequently, plastic sheeting was not well fixed on the roof and tore easily.

Logistics and materials

All materials were purchased locally, though the ability to guarantee the sustainable management of the forests from which the poles were cut was limited. The use of alternative materials was not pursued due to transporting issues and the potential for further delays.

Due to a shortage in dry grass, plastic sheeting was distributed as a roofing material. The shortage of other locally available materials delayed the implementation of the project.

A.7 Rwanda - 2008 - Returns

Materials distribution and technical guidance

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

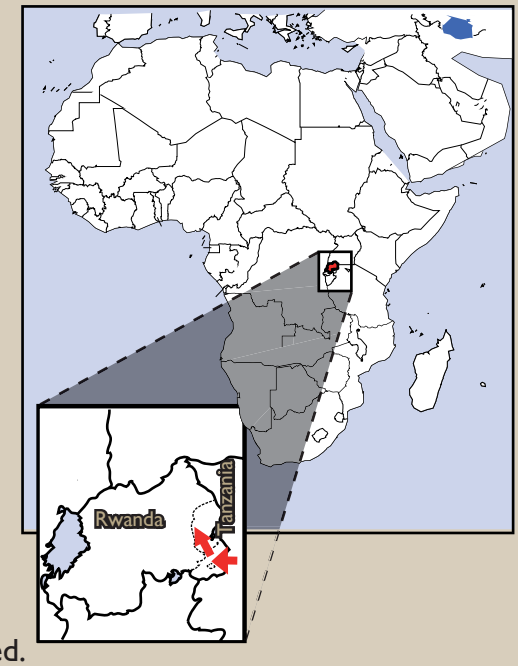
Emergency:
Forced repatriation of people of 'Rwandan origin' from Tanzania to Rwanda

No. 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:
All 220 shelters completed by August 2008 were occupied.

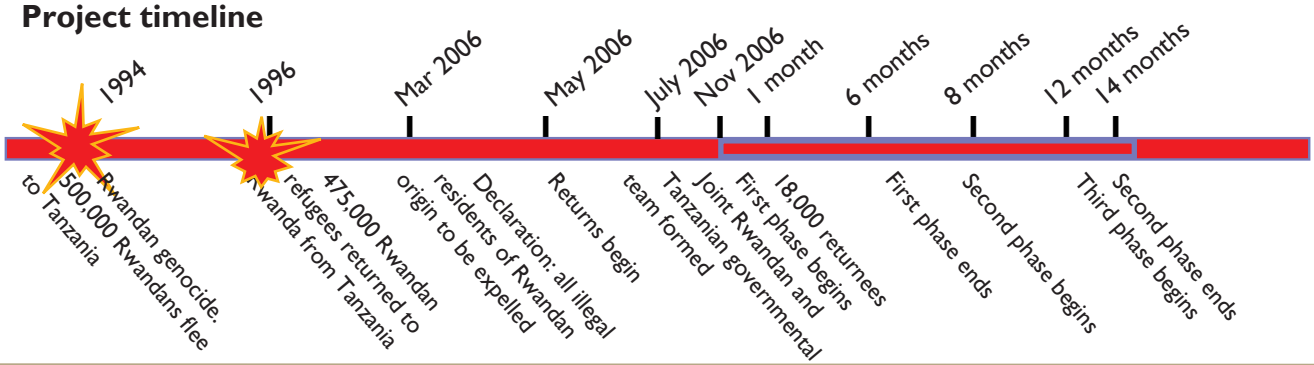
Shelter size
48 m^2 (6m x 8m)



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 associations was to collectivise the tasks required for house building.

Project timeline



Strengths and weaknesses

✓ By collectivising activities in mixed beneficiary associations, shelter was built for all members of the community without requiring a different construction process for vulnerable households.

✓ Participation of vulnerable beneficiaries in the construction process was possible and necessary.

✓ Integration of returnee families and local families in one resettlement site meant that the association approach increased opportunities for integration.

× Some houses were quickly attacked by termites as timbers had not been treated or protected.

× People had to resolve their current shelter problems as best they could until their house was completed. For some families this meant living in makeshift shelters for nearly two years.

Completed shelters

Situation before emergency

Despite a long history of welcoming Rwandan refugees, the Government of Tanzania decided in March 2006 to expel people of 'Rwandan origin' who had arrived in Tanzania at any time from the 1920s onwards and who did not have legal permission to stay.

Four categories of illegal immigrants were defined: migrants from the 1920s, 1959 refugees, 1994 refugees and those that had arrived from 2005 onwards. Most of these people lived in the Kagera region of north Tanzania (which borders Rwanda) and many did not speak Kinyarwanda, the primary language of Rwanda. Only a few hundred of those specified by the criteria lived in the refugee camp in the region. The vast majority were integrated into the local Tanzanian communities.

Forced returns began in May 2006 and many of those forced to return experienced violence in some form and had their property seized. Many returnees, the majority of whom were women and children, arrived in Rwanda empty-handed and without relatives to stay with.

After the emergency

A return process was agreed to by the Rwandan and Tanzanian governments in July 2006. Returnees passed through a transit centre in Kiyanzi, in the Kirehe District of Rwanda, where they would wait before being allocated land in the east of the country by the government.

The Rwandan government identified a number of resettlement sites, including Rugeyo and Ndego. Joining 208 returnee families in Ndego were 156 poor households from the surrounding area, which the Rwandan government hoped would help with integration in establishing the new 'villages'. In Rugeyo, 105 returnee households were settled on their own.

Although each household was allocated its own plot of land, the resettlement sites lacked both water and sanitation. In cooperation with the local district authorities, the project agency provided accommodation and latrines to 469 families in the Rugeyo and Ndego resettlement sites.

While the beneficiaries completed their houses, they lived in temporary, makeshift mud huts with roofs made of plastic sheeting, which was distributed as part of a return package.

Selection of beneficiaries

With returnees having to rebuild their livelihoods from scratch, the project used the construction programmes to create a sense of solidarity among the returnees and the local families that had moved to the new villages, and to support the returnees in providing for themselves.

Both returnees and local families living in the resettlement sites were considered as beneficiaries of the project, with all households requiring shelter. Vulnerability criteria were used to decide which houses would be built first.

Implementation

Beneficiary associations were established by the agency in collaboration with local authorities. The associations were small groups of beneficiary families formed to collectivise the tasks required for house building. Peer pressure within the group helped to ensure that tasks got done.

The formation of associations was accompanied by an intense community mobilisation campaign. Representatives of local authorities and community leaders conducted meetings with all beneficiaries to explain the aims of the project and how the project would be implemented.

Beneficiaries were free to chose which group they wanted to join as long as each group had a mixed membership. Each group had to include women and men, young and old people,

those of different physical abilities, as well as able people.

Each association produced the necessary materials to build houses for all the families in its group. They produced the clay bricks needed (1,800 for a house; 200 for a latrine), dug latrines, de-barked timbers to be used for construction and cleared and levelled sites. Associations were registered with the local authority and all work was unremunerated.

'Nobody is vulnerable! You can always give something to your community!' *-Slogan of the mobilisation teams in the returnee communities*

Through the collectivisation of tasks it was possible to build houses for all members of the community. This would not have been possible if families had worked alone. Materials that could not be produced were provided: cement, foundation stones, sand, construction wood, doors and windows, roof sheeting, as well as tools and other non-food items. Materials were provided at the appropriate stage of construction.

Before house building began, the agency contracted skilled masons to build latrines, each shared by two households. Once the latrines were completed and the necessary construction materials were produced, house building could begin.

Although no other shelter materials were provided for the transitional period between arrival in the new villages and construction of new houses, the agency supported initial livelihood recovery with a distribution of seeds and food rations.

The construction of each house was overseen by a skilled mason hired by the agency and paid a total of US$ 240 in five instalments for each house. Each household appointed one person from the household to be an assistant to the mason, who monitored the attendance and contribution of the assistant. In return for providing their labour, the 'assistants' learned basic construction skills as well as improving their physical living conditions.

The associations were supported by agency field workers who dealt with questions and resolved problems.

Technical solution

After approval of the house design by the Ministry of Infrastructure, the building of houses was monitored by the agency, with inspections made by local authority representatives.

The design is based on local building traditions but with some upgrading, such as cement plastering.

Each house provides 48m^2 of covered living space (6m x 8m) and has four rooms and one corridor with two doors. A foundation of hardcore, sand and cement is laid for each house and the exterior of the mud-brick walls is coated in 'rough-cast' – a mixture of cement and other materials to provide protection against the weather.

The roof is made of galvanised roofing sheeting and additional roofing sheets were used for the guttering.

Each house is equipped with a rainwater catchment system, storing up to 1.2 cubic metres of water. The system follows the local design and uses cement layers cast together over a reed mould. Local technicians were hired to produce the mould and others to make the cement layers.

To reduce the fuelwood used for cooking, the agency has developed a stove design in collaboration with the Kigali Institute for Science and Technology. The stove can be built out of local materials and has greatly improved fuel efficiency, protecting the community's natural resources from deforestation.

Planned shared services

In its third phase, the project is now concentrating on the following shared services:

- A multi-purpose community centre to be shared with surrounding villages. It is intended be a semi-open hangar accommodating up to 300 people with storage rooms for materials and products of local workshops.
- A day centre for children whose parents worked in the fields.
- Boreholes are also planned to improve access to clean water.

Logistics and materials

Some materials were transported directly to the site and distributed to each plot. Other materials of high value or requiring special storage were stocked in a nearby warehouse and distributed on demand.

Beneficiaries were involved in the quality control of materials and were responsible for ensuring the security of the warehouse.

Materials	Quantity
I) Foundation	
Twine for setting out	2 balls
Cement	2.5 sacks
Plastic sheeting for roof	0.2 roll
Hardcore	10 m^3
Sand	5m^3
II) Walls	
Brick mould	1 piece
Plastic sheeting for water	1 piece
Timber planks	5.5 pieces
Breeze blocks	8 pieces
Poles for scaffolding	4 pieces
Mud bricks (20 x20x35 cm)	1800
III) Roof	
Poles for truss	26 pieces
Nails 15cm	3 kg
Nails 12cm	3 kg
Nails 10cm	3 kg
Nails 6cm	2 kg
Roofing nails	3 kg
Roofing sheets	29 pieces
Strip iron - for binding joints	18 pieces / 1.5m each
IV) Exterior	
Cement	3 sacs
Doors	2 pieces
Windows	4 pieces
V) Other	
Roofing sheets for gutter	2 pieces

A.8 Somalia - 2007 - Civil conflict

Resettlement

Project type:
Resettlement project
Support to local authorities in sourcing private land
Security of tenure to IDPs and urban poor
Provision of extendable one-room shelter
Service provision to family plots

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

No. of people displaced:
400,000 IDPs in Somalia before 2007; 1 million in 2008
25,000 IDPs estimated to be in Bossaso

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

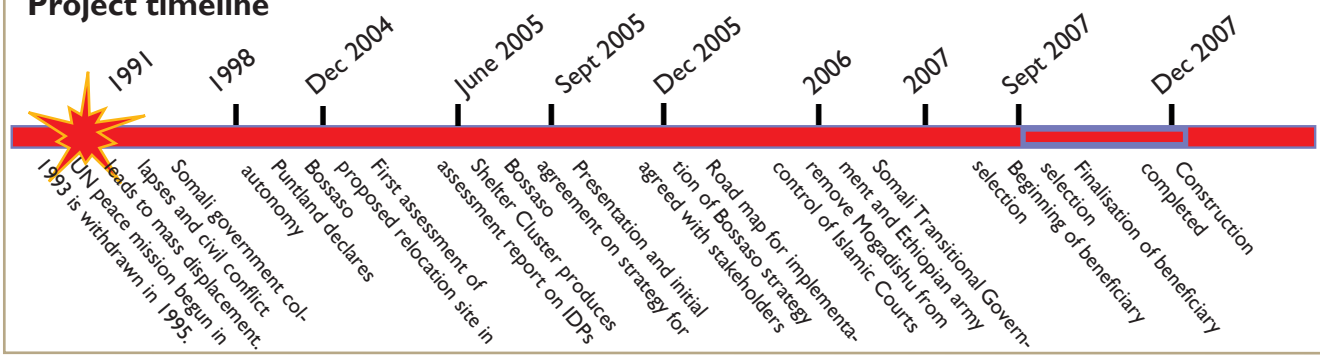
Occupancy rate on handover:
100% of resettled IDPs (112 families);
25% of urban poor (7 of 28 families)

Shelter size
13.5m^2 extendable shelter on a 7.5m x 15m plot (including shower and toilet)

Summary

A resettlement project in Puntland, Somalia, preceded by in-depth 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.

Project timeline



Strengths and weaknesses

✓ Beneficiary involvement in construction increased a sense of ownership and sometimes meant a higher quality of workmanship at lower cost compared to contractors. Contractors were necessary for some of the infrastructure works.

✓ Announcing the outcomes of meetings publicly was one way of avoiding a breakdown of communication with local authorities and ensuring transparency.

- In a place without clear land policies, laws or record systems, land issues were complicated and sensitive and required careful investigations, localised responses and public awareness-raising through mass media and meetings.

- Joint planning and implementation by agencies through a coordinated system was necessary to limit manipulation of the process by powerful groups.

- Although slow, the beneficiary selection process used simple and verifiable criteria that ensured that the target group was assisted.

- Donated land does not always guarantee sufficient quantity or quality of land. As a result, an integrated urban development plan can be hard to develop. Assessment of land suitability and direct discussions with private landlords to clarify donation conditions are necessary before land is formally donated to the municipality.

× Working with the municipality was difficult, due to its low capacity, high turnover of staff and overlapping responsibilities with the clan system. Documenting

Strengths and weaknesses (continued)

decisions and agreements made was of little help due to literacy issues.

× Selection of beneficiaries took much longer than expected, so some construction work began before knowing who the final beneficiaries would be. This limited participation.

× At times not all the humanitarian agencies involved communicated the same messages. This meant that agreements sometimes had to be renegotiated.

Photos: Ombretta Tempra

Sites and services: the project focused on negotiating land and providing access, secure compound walls, water and sanitation.

Background

Bossaso is a coastal town in the Puntland region of northern Somalia. Puntland, with 2.8 million mostly nomadic/pastoralist inhabitants, has been semi-autonomous since 1998. Due to its relative stability, it has become an attractive area for IDPs fleeing conflict in South Central Somalia.

Bossaso has a significant population of IDPs, many of whom had been present for over ten years. The livelihood opportunities created by the fast-developing port of Bossaso is a strong pull factor, along with some IDPs' clan connections in the area.

There is no land administration and there are few documentary records, so customary law, secular law and sharia law all overlap.

Aim of the project

The idea of the permanent resettlement project was to substantially improve IDP protection, security of tenure, access to basic services and infrastructure (especially water and sanitation), and to provide a solid base for income-generating activities (renting out rooms, space for shops or productive activities), in addition to the provision of a better shelter.

Freeing IDPs from paying rent for inadequate shelter meant that they could use resources for basic services, such as education and health. Construction training would provide beneficiaries with new skills.

The project indirectly tackled governance-related issues relating to land, and broader urban development and city planning issues. Approaching these issues directly, without a clearly visible project, would have been difficult.

Implementation

Negotiations with authorities for accepting the permanent resettlement of IDPs within Bossaso, and the relative provision of suitable land, began in 2004. These negotiations were linked to a joint UN strategy for IDPs in Somalia published in 2005.

Once a strategy for Bossaso had been agreed upon between humanitarian agencies and Bossaso authorities, the project began in 2006. It was implemented by a consortium of agencies, all of whom were represented in the newly established Somalia Shelter Cluster.

Construction was completed by the end of 2007. The duration of the project was longer than initially envisaged, due to difficulties in obtaining land, a long beneficiary selection process and the challenges of maintaining consensus with a relatively unstable and inexperienced local government system.

Land issues

The original site proposed by the local authorities was rejected on the grounds that it was too far from the town and limited economic integration of the IDPs with the host community. This was a key requirement by the agency to improve livelihood opportunities for beneficiaries and promote peace between the IDPs and the host population.

A committee was established to identify land within the current urban growth areas. During Ramadan, calls were made for land donations. Five of the offered sites were selected and officially handed over to the municipality. The land transfer was endorsed by the sharia court in December 2005.

With no clear legal framework in Puntland, customised 'letters of allotment' had to be developed to substitute for an 'ownership title'. Beneficiaries received the right of occupation, use and inheritance for the first 15 years. After this, each family would also acquire the right of disposal (selling the property for profit). For the document to provide the strongest protection for IDP tenure, it was signed by the beneficiary, the mayor, the minister of local government and the magistrate of the sharia court.

Selection of beneficiaries

Beneficiary selection took longer than planned. Some 80% of plots were to be allocated to IDPs and 20% to poor families from the host community. This approach limited the interest of powerful members of the host community from exerting too much influence in the selection of IDP beneficiaries. Post-occupancy assessments found that few of the urban poor beneficiaries in the project


Photo: J. Ashmore

Many of the sites initially offered were rejected because they were far from Bossaso and possible livelihoods. The five selected sites were donated following requests for land made during Ramadan.

occupied their site, preferring instead to rent out the new accommodation or leave the house empty, while the occupancy rate on project completion from IDP families was 100%.

The selection process, managed by the multi-representative Bossaso selection committee, began in September 2006. IDP beneficiaries were selected by April 2007, but agreement on urban poor beneficiaries was not reached until November 2007.

Before selecting individual families, the IDP settlements with the worst shelter conditions were identified. Selection committees were formed in each of these settlements and were tasked with putting forward individual households who had lived in Bossaso for more than six years, with no fixed assets and at least three children. More detailed 'vulnerability' criteria were rejected due to the complexity of Somali family structure and the lack of identification documents.

Selection lists were made public to allow time for complaints to be investigated (one of the settlements produced a list that excluded an ethnic minority). The final selection of the 112 IDP families was made through a lottery broadcast on local TV and radio, which was deemed a fair method by beneficiaries.

'Compared to the shelter I had before, I can now say that my life has improved 100 percent. The resettlement programme was completely transparent and well done'.

Technical solutions

This project provided the infrastructure for a serviced community settlement, well integrated with the host population, and support to IDPs for the building of individual dwellings within the settlement.

Contractors were used to trace roads for the new settlement and connect it to the municipal water supply. This also benefited those living along the route of the new water pipes. An ongoing solar-powered street lighting project was also started towards the end of the project.

A plot was provided within the settlement for each family to construct their own house, with support from the consortium.

Two different agencies implemented the construction of the 140 housing units in two phases using contractors. The first phase took five months and involved the construction of foundations, boundary walls, sanitation (shower, toilets and septic pits) and a 4.5m x 3m floor slab. Phase 1 cost US$ 1,850 per housing unit.

The second phase began after beneficiary selection was complete and took three months, finishing in December 2007. The beneficiary families moved onto their plot, living in a temporary tent-like shelter provided by another agency until the work was completed. The temporary shelters were later used as additional rooms or for storage.

Food for work for a maximum of 30 days was provided to beneficiaries for the construction period, along with US$ 30 to hire a mason (families sometimes did masonry work themselves, with technical support, and kept the money). The main agency provided technical support in the form of cash for skilled labour and employment of a foreman for supervision.

Giving the families the opportunity to select their own mason (rather than following the wishes of the local authorities who wanted the whole construction process contracted out) meant that they had greater quality control over the work done and allowed the agency to avoid the problems of a tendering process.

The cost for the second phase was US$ 580 per housing unit. This excluded agency staff costs and food-for-work contributions but included all other logistics, administrative and material costs.

Logistics and materials

Materials were procured locally, with contractors responsible for their own procurement.

Bill of quantities

The following table shows the bill of quantities for Phase 2 of the project, averaged for a single unit (some units were corner units rather than free-standing).

Materials	Quantity
Hollow concrete blocks (150 mm x 390 mm x 180 mm)	281 pieces
Cement for mortar and concrete ring beam	5 bags
Sand for mortar and concrete ring beam	1 tonne
Aggregate / ballast for ring beam concrete	0 tonnes
Y8 bars (12m long) for ring beam	4 pieces
R6 rings (6m long) for ring beam	2 pieces
6x1 white wood for form work	12 metres
28-gauge galvanised corrugated iron sheets	14 pieces
Structural grade 150 x 50 (6' x 2') timber roof rafters	18 m
Structural Grade 75 x 50 (3' x 2') timber roof purlins	27 m
Roofing nails	1 kg
Ordinary wire nails	1 kg
Steel single doors (0.8m x 2m)	1 set
Double leaf-steel window (1m x 1m)	1 set
White wash	4 bags
Brushes for whitewashing	2
Bamboo/rope for ceiling mats	As required

A.9 Darfur - 2004 (ongoing) - Conflict

Materials distribution

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

Emergency:
Response to displacement caused by violent conflict in Darfur, Sudan, 2004 (ongoing)

No. of people displaced:
Over 1 million people affected (May 2004 estimates); 700,000 people internally displaced

Project target population:
1 million people initially (167,000 families)
Increased to 1.4 million people in September 2004

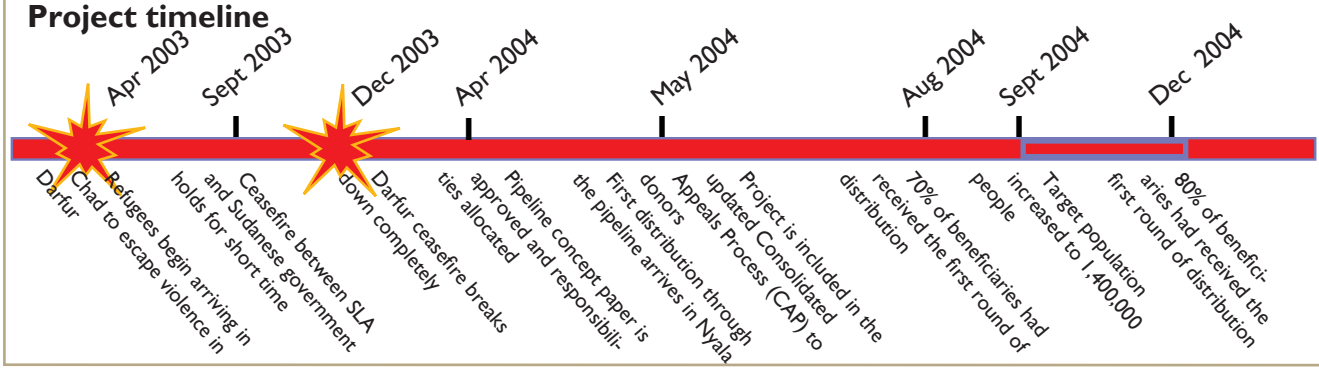
Occupancy rate on handover:
80% of target population reached by December 2004
A further 8% of beneficiaries reached by those not operating within the pipeline

Shelter size
Maximum of 20m^2 of covered space for a family of six people, provided by a 4m x 5m plastic sheet. Actual covered space would have been less, due to the need to fix and fold the sheeting.

Summary

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

Project timeline



Strengths and weaknesses

✓ More effective use of overall emergency funds due to economies of scale.
✓ Reducing logistics overheads for individual humanitarian agencies in the field meant they could concentrate on service delivery to beneficiaries.
✓ Reduced competition for transport and warehousing among agencies limited price inflation.
✓ Customs clearance from the government was more easily obtained by the UN than NGOs, so collective purchase reduced customs obstacles.
✓ Common purchasing meant greater ability to direct resources based on a broad overview of need in the region.
✓ Centralising stock in a warehouse outside of the conflict area meant that goods were not tied up in warehouses in the 'wrong' areas, so interruptions to distribution by security problems were minimised.
✓ Early donor commitment of funds and air cargo

Strengths and weaknesses (continued)

allowed the project to move quickly. Donor coordination meant funding went through a central channel, avoiding duplication of projects.

✓ Individual agencies in the field augmented the provision of shelter items with their own locally procured materials (such as poles) to provide shelter solutions.

× Roles could have been decided more quickly at the beginning, as slow-moving discussions delayed initial implementation.

× Some key items (poles and cooking fuel) were problematic to procure in bulk and the poles were not supplied.

× Without the distribution of a frame, the distribution of plastic sheeting did not constitute a complete 'shelter solution'. If not provided by an NGO working in the field, IDPs had to provide these items themselves, which carried risks in terms of collecting material from unsafe areas or having to buy local materials at high prices.

× Shelter issues were seen as being dealt with by the provision of basic materials and the project had limited technical support to help consider what other shelter issues might need to be addressed.

× Access was severely restricted due to the conflict itself and limitations set by the government.

Photo: Joseph Ashmore

Queue for distribution of materials

Situation before emergency

Before 2004, Darfur was one of the poorer areas of North Sudan. Although there are no exact figures, its mostly rural population had limited access to safe drinking water and had poor child nutrition. The region's increasingly scarce natural resources of grazing land and water were one of the factors behind the conflict.

The situation in Darfur became increasingly volatile throughout 2003, with refugee movements beginning as early as April. The crisis began to escalate at the end of the year. Response to the crisis in Darfur was hampered by the Sudanese government's restriction of access to the affected areas.

Joseph Ashmore

Unloading a lorry of relief items

Situation at the initial response stage

At the end of 2003, humanitarian agencies were able to access less than 5% of IDPs due to travel restrictions imposed by the Government of Sudan. This made accurate needs assessment difficult. The May 2004 revision of the Consolidated Appeals Process for Sudan estimated a US$ 22.5 million need for shelter and non-food items for the remainder of the year.

The severe lack of shelter available to IDPs was a major health threat, with exposure to heat and dust during the day and very cold temperatures at night. By May, exposure to rains led to an increase in communicable diseases.

Selection of beneficiaries

The project aimed to reach all of those displaced by fighting in Darfur, which by April 2004 was estimated to be a total of 1 million people. Beneficiaries were then divided into categories of full or partial assistance so that the most vulnerable would receive a full package of items. Those receiving a partial package were assumed to be able to supply missing materials themselves, which may not have always been the case.

By August, 70% of the beneficiaries were reached with 'first tier' NFIs, comprising plastic sheeting, blankets, jerry cans and soap. In September the number of beneficiaries in need was raised to 1.4 million and by December 2004 around 80% of this target population had received assistance. This equated to almost half a million blankets and other material by the onset of winter. An additional estimated 8% was covered by other agencies not using the common pipeline.

Technical solutions

With the shelter materials supplied, beneficiaries were assumed to be able to construct basic shelters using poles as frames, plastic sheeting as a roof and rope for fixings.

However, procuring poles in bulk at a national level proved too difficult and these were left out of the package. This meant that no complete shelter solution was provided.

Many agencies in the field planned a shelter response where they augmented the materials received through the pipeline with items they procured locally, such as poles. However, the lack of a clear idea of how beneficiaries would use items to create shelters meant that some beneficiaries would have had to source construction materials themselves. These may have been expensive, or, in the collection of poles, have entailed the same risks to personal security that many women faced when collecting wood for fuel.

The limited consideration of technical shelter issues was unsurprising considering that the programme's main focus was on the logistical challenges of mass distribution.

Implementation

Meetings to discuss the idea of a pipeline were held in March 2004, with a concept paper for funding included in the updated Consolidated Appeals Process released at the beginning of May 2004.

With such a large affected population and the government restricting both access and imports, the main aim of the pipeline was to get enough non-food items and shelter items into the hands of beneficiaries as quickly as possible to cover basic needs.

During April 2004 a structure was agreed upon for the management and implementation of the pipeline. The process was supported by several donors and the final allocation of responsibility was undertaken by the UN Country Team. The organisation of the pipeline was split into two main parts: a supply part and a programme part.

For the supply part of the programme, one UN agency was nominated for procurement, which would be distributed as far as a centralised warehouse (though this process started later in the year). An NGO was responsible for the ongoing transportation and storage of these items to sub-level warehouses and the UN agency that made the original pipeline proposal was made responsible for co-ordinating the supply chain.

In addition, a third UN agency agreed on 19 April to act as a 'consignee' to officially receive imported goods, an extension of their role in receiving food items. This was crucial, as individual NGOs were unable to clear customs as quickly as the well-established UN agency.

On the programmatic side, coordination of needs analysis, gap identification and interaction with humanitarian partners in the field was carried out by the UN coordination agency and the agency that initiated the whole project.

Emergency shelters

'Coordination with all of the agencies was key. We held weekly meetings in Khartoum and the field and set up information-sharing systems such as a website. No one had an excuse for not knowing what was going on!'
- Coordinator

The centralising of procurement and the management of an efficient and cost-effective supply chain reduced the logistics overheads for agencies on the ground, freeing them up to concentrate on direct assistance to beneficiaries.

The coordinating agencies were able to keep an up-to-date broad overview of the requirements in Darfur, which helped to direct assistance to those areas most in need and prevented a duplication of response.

Any agency wishing to receive items from the pipeline had to fill in a request form and a basic needs assessment form. The procurement agency delivered items to El Obeid and/or Nyala. From there the NGO responsible for distribution arranged for deliveries to their warehouses in the different state capitals. The individual NGOs responsible for making the initial request would then make the final distribution to beneficiaries.

Information-sharing on needs gaps, current stocks and supply chain updates was achieved through regular meetings and access to an open website.

Logistics and materials

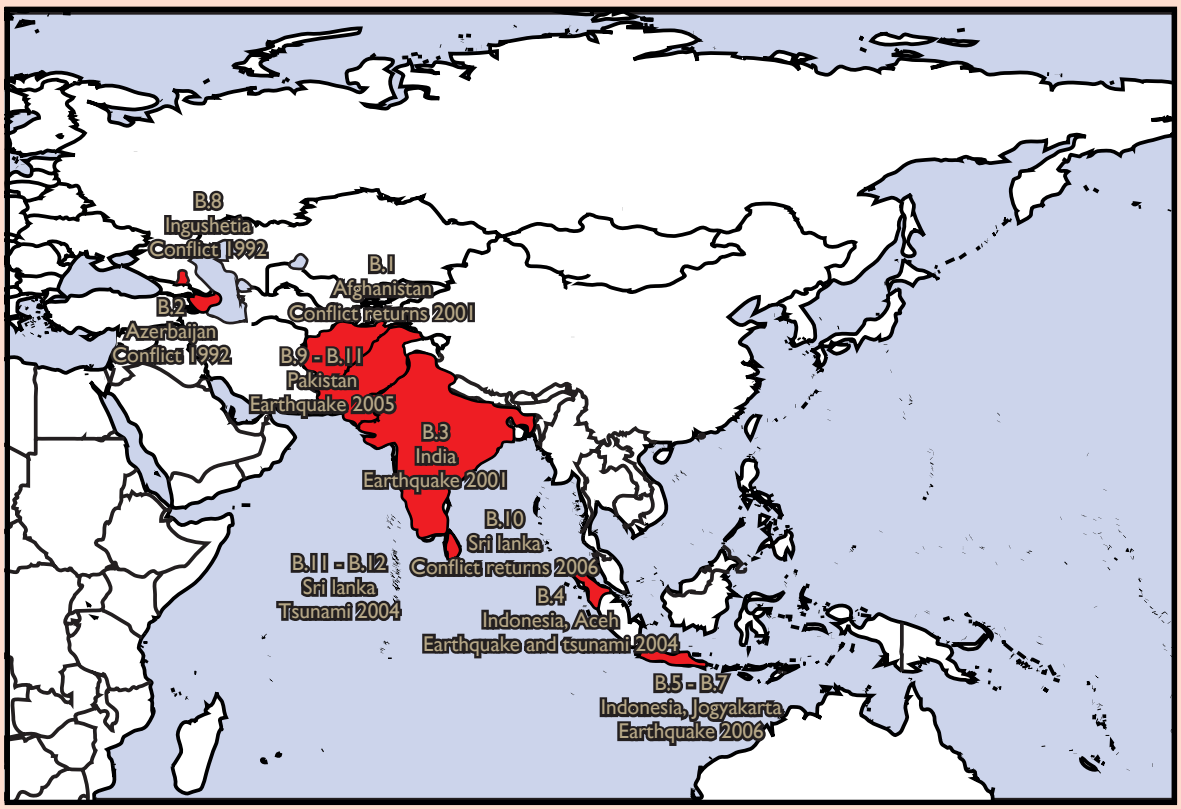
A basket of non-food items was agreed on by participating agencies. This basket included plans for some sanitary items, clothing and kitchen sets. Initial plans for additional shelter items – poles and rope – were dropped after it proved too difficult to provide them. Plastic sheeting was mostly donated from abroad or imported. Other non-food items were purchased in Khartoum or Nyala.

Shelter items in the NFI basket

Note: Other items, such as sanitation items, were also supplied in the non-food item basket, but are not listed here.

Materials	Quantity
Blankets	2
Plastic sheet (4m x 5m)	1
Rope	20 m
Poles	6 planned, but not distributed
Sleeping mat	2

Section B
Asia



B.1 Afghanistan - 2002 - Returns

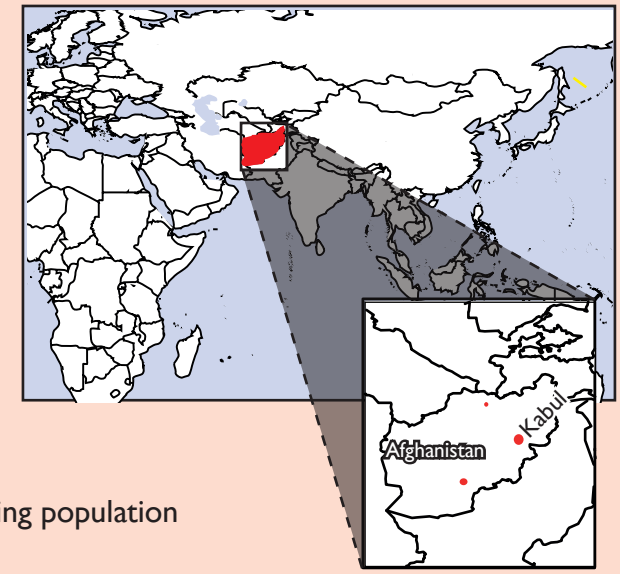
Case study: Shelter construction

Project type:
Package of shelter construction materials
Self-build shelters
Cash grants
Technical support

Disaster:
Afghanistan repatriation, 2002-2008

No. of people displaced:
5 million or more returnees since 2002

Project target population:
1.2 million beneficiaries to date
Average family size of six people
Shelter provided for an estimated 25% of returning population

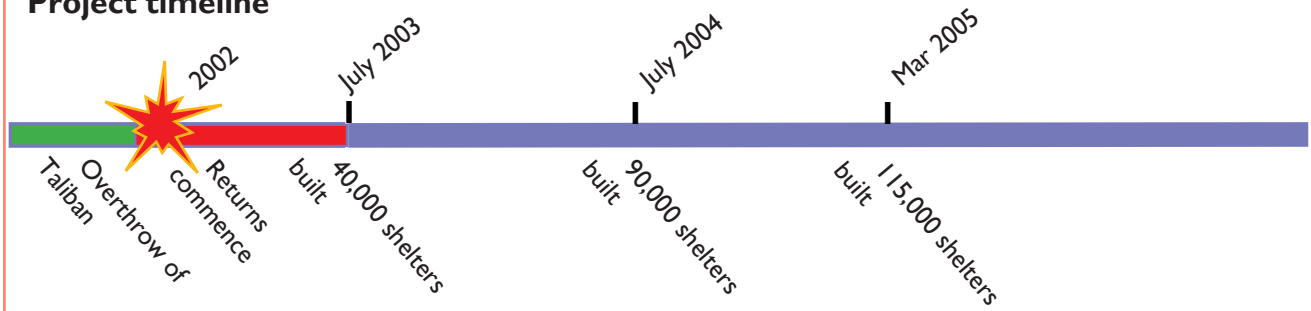


Occupancy rate on handover:
Unknown

Shelter size
Maintaining a 21m^2 minimum net floor area was strongly recommended. The shelter consisted of two rooms, one corridor and an external latrine. The shelter plan could modified if it was within the allocated budget and if structural integrity was not compromised.

Summary
A large-scale, self-build shelter programme implemented through partner organisations to help meet the needs of the 5 million people returning to Afghanistan since 2002, following conflict since 1979. 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 US$ 5 million under budget for 2008.

Project timeline



Strengths and weaknesses

✓ Very large-scale programmes are possible using partner organisations as implementers.
✓ Efforts were made to encourage equitable and gender-sensitive participation in beneficiary selection.
× Building sites must be serviced. On some new build sites, site selection and provision of water and infrastructure were poor.
× The non-anticipated rise in international materials prices severely effected the programmes.
× Inequality between the responses of different organisations has led to some of the cheaper shelters being demolished by their owners.
× There were delays in shelter provision for the landless.

Urban housing in Kabul

Project background

Since 2002, there have been over 5 million returnees to Afghanistan, displaced over 20 years of conflict. The largest returns are from Pakistan and Iran. Three million refugees remain in host countries and it is estimated that 1 million more will return by 2013.

Those returning through official schemes receive a 'one-off' grant of US$ 100.

Selection of beneficiaries

Traditionally, there is serious under-representation of women in public decision-making in Afghanistan and significant control is in the hands of a few non-elected individuals. To remedy this, beneficiary committees were formed in each project area. Each committee consisted of the lead and implementing organisation, a local government representative and members of the population for whom the project was targeted.

Land issues

The project could only provide shelter materials to those who had land to build on. Returnees with no land had apply to the Government of Afghanistan's managed land allocation scheme. However, this scheme has proven slow to operate in the past. As of mid-2008, approximately 500,000 returnees have registered for land and very few of them are now living on registered land.

It was originally anticipated that 55 land allocation sites would be provided through the support of the Ministry of Refugees and Returnees. This number was reduced to thirteen, partly due to the unsuitability of selected sites.

One of the challenges with building on new sites has been to coordinate with other organisations to provide services on previously uninhabited sites. In some cases this has not happened and has led to shelters being unusable.

Technical solutions

Shelter programmes in Afghanistan started as a distribution of tents and household items. The main focus gradually turned to shelters.

This programme began building mud-block shelters with wooden roofs, windows and doors. Due to supply and sustainability issues, steel was used to replace the timber.

'There are strong indications that more women are now participating in programme decision-making'.

As the programme worked across the entire country of Afghanistan, there were significant variations in climate, cultural values, construction materials, capacity of implementing partners and community support mechanisms. This led to the development of standard formats for technical specifications, data collection, reporting, feedback and analysis.

The following key regional variations of shelter design were adopted:

- Dome-type ceiling without beams in west and north Afghanistan;
- Flat roof with beams in central, east, south-east and south Afghanistan;
- Smaller windows in the Central Highlands area than in other areas. Relatively wider windows can also be found in the central region.

Implementation

The shelter programme is based on a four-stage process:

Stage I: Planning - Allocation of shelter per region/province/district, budgeting, identification of implementing partners, establishment of materials supply contracts.

Stage II: Contracting – Establishing contracts with implementing partners.

Stage III: Assessment – Local needs assessment and beneficiary selection.

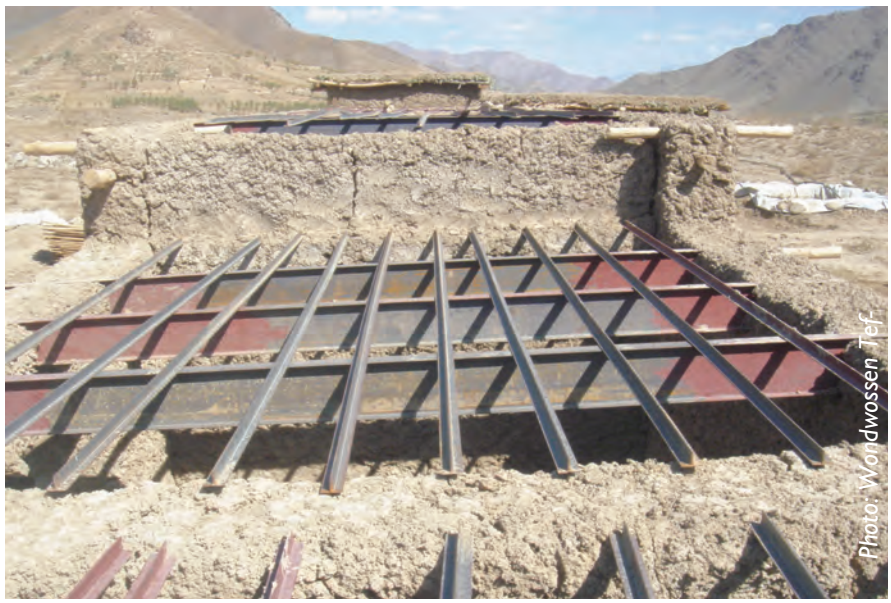
Stage IV: Implementation.

- Work started on site and foundation completed (eight weeks).
- Walls erected, lintels installed (four weeks).
- Shelter completed (four weeks).
- Handover (liquidation period, four weeks).

Logistics and materials

In the first years of this programme, the timber was sourced from South Africa and Pakistan. Supply challenges and major sustainability issues with the sourcing of timber have led to revised designs for 2007 onwards that will use steel in place of timber.

Completed shelters



Steel trusses

During 2007 and 2008, rising costs of steel led to cost escalations from US$ 900 per shelter to in excess of US$ 1500 per shelter. This caused serious budget shortages and the materials used consequently needed to be reassessed.

Completed shelter

Internal view

B.2 Azerbaijan - 1992 - Conflict - People displaced

Case study: Upgrade of collective centres

Project type:
Upgrade of collective centres

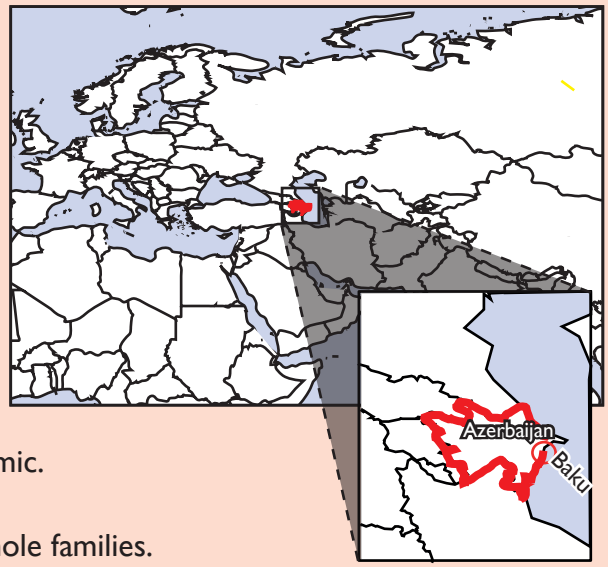
Disaster:
Nagorno Karabakh conflict

No. of people displaced:
700,000 people displaced
40,915 families (169,609 people) came to Baku in 1992-1993

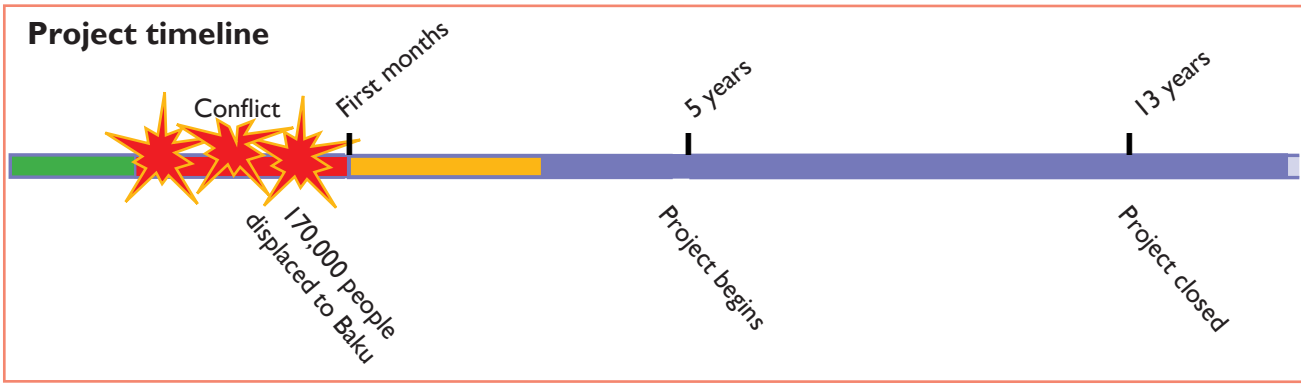
Project target population:
27, 500 people in over 60 buildings over 8 years

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

Shelter size
Variable. Individual rooms are 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 and 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.

Strengths and weaknesses

✓ This project provided essential maintenance. The buildings were often poor to start with and had further deteriorated with the long-term displacements.

✓ The project was able to adapt its methods to improve cost effectiveness. The final approach was to directly supervise hired master craftsmen and to use contractors to provide materials.

× The programme did not have a clear exit strategy from the outset. This led to some difficulties when the project was finally closed after eight years.

× Overpopulation, lack of a sense of ownership and high resident turnover reduced the overall durability of both repair and community activism.

× The project could have included closer cooperation with the authorities for further upkeep and maintenance. Success of the rehabilitation largely depended on close cooperation and support from the local authorities, since many problems required intervention outside the public building.

This case study draws heavily on: *Project review report: Public building rehabilitation, Baku, Azerbaijan*, by Bayaz Zeynalova, 2007. (www. reliefweb.int)


Photo: NRC Azerbaijan


Photo: NRC Azerbaijan

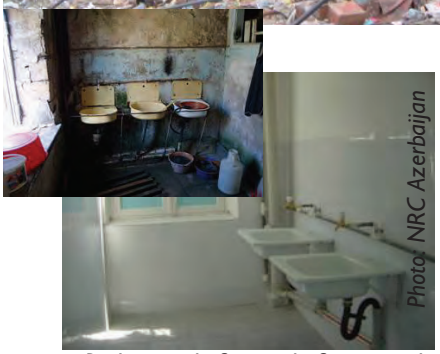


Photo: NRC Azerbaijan

Bathrooms before and after upgrade

Context

The conflict in Nagorno-Karabakh between Azerbaijan and Armenia in the early 1990s led to over 500,000 people becoming internally displaced and a further 200,000 becoming refugees. Around half of the internally displaced people moved to urban areas, most of them to the capital, Baku.

In Baku, many people moved into dilapidated, overpopulated public buildings, most of which were originally student residence halls and dormitories. The buildings were designed with rooms intended for one person, not for families of five or more. The kitchens and bathrooms were shared. In some cases the buildings were without water supply or sanitation. This was in the context of a significant growth in wealth in Baku, in part due to the oil industry.

The temporary shelter solutions found following the conflict lasted longer than was expected. Many of those displaced following the conflict had been living in one of twelve camps. The last of these did not close until 2008, after fifteen years. Upon its closure, many of the camp residents were resettled rather than being able to return to their original homes.

The climate in Baku is cool and wet in the winter and hot and dry in the summer, leading to challenges of leaking roofs and poor sanitation.

Selection of buildings

A programme to upgrade the public buildings and schools was adopted.

Criteria for the selection of public buildings for inclusion in the programme were adjusted throughout the project period. However, the main criteria remained unchanged: at least 70% of building inhabitants had to be IDPs; other organisations could not have previously worked in the building; and the building had to be in exceptionally bad condition.

In its first years (1998-1999), the project prioritised hostels located next to each other and that shared a common yard. Such locations made repair works easier and reduced costs. Letters from local or central authorities, as well as applications from the residents, were also considered in the selection process.

The willingness of the building residents to work with the NGO was the decisive factor in the final selection. Inhabitants had to be willing to volunteer to help with repairs, and to clean corridors and shared areas. In some cases, works had to be suspended until the community agreed to fulfil the NGO's conditions.

Not everyone benefited equally from the project. Although similar works were performed in most of the buildings, several of them were only partially rehabilitated (only roof or electricity) for a variety of reasons.


Photo: NRC Azerbaijan

Technical solutions

Inhabitants saw broken sewerage as the greatest problem in the buildings. Other common problems included shortage of water, leaking roofs and dampness. As a result, plastering, floors and ceilings in toilets and bathrooms were damaged in most buildings.

A typical repair of a public building involved:

- rehabilitation of the shared areas - toilets, bathrooms, washing rooms, kitchens and corridors;
- infrastructure repairs - electricity, sewerage, water and sewerage pipes;
- repair of roofs;
- installation of new water heaters, sinks, stoves, faucets, showers, light bulbs, circuit breakers, switchboards, windows and doors;
- installation of electricity transformers (this was not costly but served a large number of IDPs).

The most durable output of the project was the provision of electricity systems (including transformers and switchboards) and new roofs.

The project was not always successful in solving problems with the water supply. A durable solution would have required dealing with the malfunctions outside the building, which was beyond the scope of the project. Cooking stoves and taps in the rehabilitated buildings had short lifespans because many people used them.


Photo: NRC Azerbaijan

Kitchens before and after upgrade

Implementation

An average building took two months to rehabilitate, with the implementation scheme being significantly improved over the years.

In the beginning, contractors were hired to implement the work. In practice, this meant that the NGO purchased construction materials and hired contractors to implement all works. The payment of labourers lacked transparency and important irregularities in the system were found. This led to the dismissal of project staff and the adoption of a new implementation scheme.

After two years of project implementation the NGO hired construction workers directly.

After five years of project implementation the NGO subcontracted a local company to supply construction materials. The supplier was selected on the basis of submitted quotes.

Over time, a good team of core construction workers, most of them IDPs, has been formed. Many of these have subsequently found work on other projects run by the NGO.

The involvement of community members in the work was seen as a key to the successful implementation of the project. The goal of the community programme was to ensure beneficiary buy-in and participation in the project. This was believed to be instrumental in creating a feeling of ownership and in the further maintenance and upkeep of the rehabilitated buildings.

Wiring before upgrade

One of the occupied public buildings in Baku

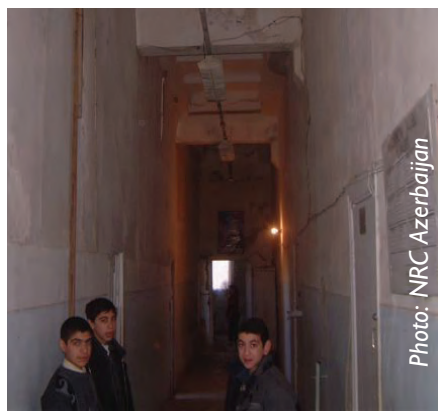
Occupancy

A survey conducted upon the completion of the project found that all of the buildings were still occupied by IDPs. However, the occupancy of individual rooms changed constantly. Many IDP families moved out of the buildings to an outskirt of Baku. In some cases, the emptied rooms were given to local families or those moving to Baku from other regions, but usually to other IDPs. According to the building superintendents, IDPs sell their rooms to relatives or friends. Yet some also lock their rooms and keep them as a storage space.

Obviously, the families who could afford to leave the public buildings were those who managed to establish some livelihoods and were relatively well off. The remaining occupants of the public buildings are still the most vulnerable of those living in the cities.

'The project was based on learning...We drew conclusions from the previous experience and made improvements every year. The work became more efficient over time'.
- Project staff member

Along with the large-scale construction of new settlements, urban public building rehabilitation became part of the 2004 State Programme on IDPs and Refugees. In many cases the repairs implemented by the State Social Fund for the Development of IDPs have copied this project.



Corridors before and after upgrade

B.3 India - Gujarat - 2001 - Earthquake

Case study: Non-food items and shelters

Project type:
Non-food item distribution
Self-build transitional shelters
Technical support

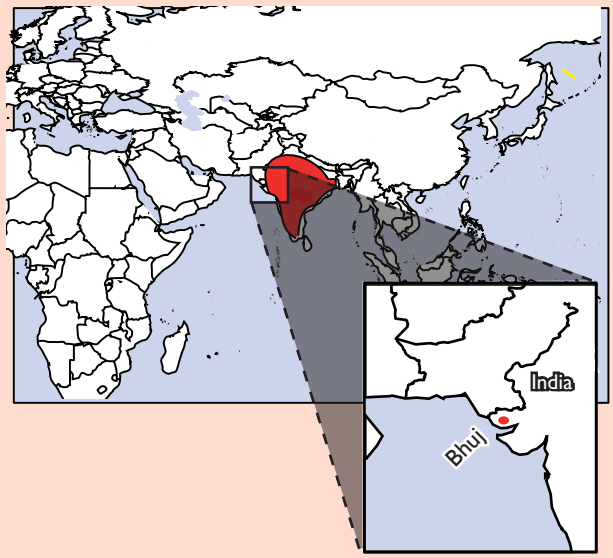
Disaster:
Gujarat earthquake, January 2001

No. of houses damaged:
180,536 completely destroyed
913,297 partially damaged

Project target population:
Over 23,000 families

Occupancy rate on handover:
Unknown

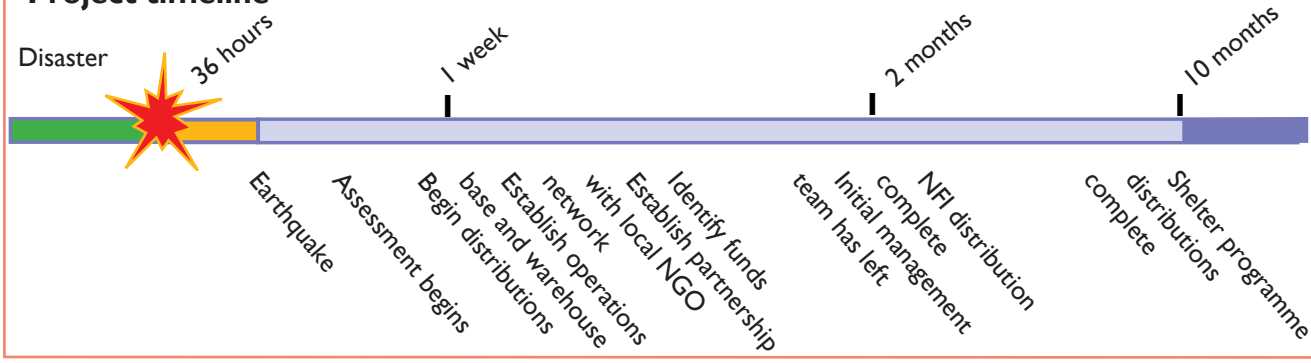
Shelter size
Approximately 4m x 2½m



Summary

An international NGO worked in partnership with a network of 22 local NGOs to rapidly implement a non-food items distribution programme followed by a transitional shelter programme that built over 27,000 shelters. By working with local organisations, existing networks and local knowledge was used to effectively deliver materials and 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 organisation, led to a lack of the paperwork required by donors.

Project timeline



Strengths and weaknesses

✓ An effective and very large-scale shelter programme was implemented within ten months.
✓ The international organisation was able to work with a strong network of local organisations to support large numbers of families with seismic-resistant designs.
✓ Many of the materials distributed to build shelters could be reused at a later stage.
× Systems that could create an auditable trail of paperwork were not set up due to the rapid nature of the response and differing organisational cultures.
× There was a high turnover of programme management staff, which led to a loss of institutional knowledge.
× The local network of NGOs that partnered in the programme was approached by multiple donors, causing it to become operationally stretched.

Note: This case study drew on *Learning by doing*, by Zahid Hussein, 2001.

Photo: David Sanderson

Damage following the earthquake at Gujarat that completely destroyed over 180,000 houses. In the first weeks after the earthquake the organisation distributed non-food items through partners. This was followed by a transitional shelter programme.

After the earthquake

The earthquake struck the State of Gujarat on 26 January 2001, and particularly affected the district of Kutch and its neighbouring areas.

News of the earthquake spread rapidly through the international media. Local communities, the Central and State governments, the defense forces, donors, and international and national NGOs all responded to the emergency.

Within one week, a network of 22 local organisations, including developmentally minded architects, had formed a partnership agreement with an international organisation. Members of this local network had been working on low-cost construction technologies prior to the earthquake and were able to act as an effective coordination mechanism. During the earthquake their focus was on:

- interim, transitional shelter (it would not be possible to build permanent shelter to meet the needs of all affected families within a year and tents were not durable enough to fill the gap);
- examples of low-cost and safe public buildings.

In the first weeks of the response the focus was on the distribution of non-food items.

Selection of beneficiaries

The initial assessment was rapid and defined some crucial needs. However, it relied on individual competence and was not standardised.

The criteria and procedures for the selection of beneficiaries for relief distribution in the communities were not always clearly defined. They were commonly left to the subjective interpretation of the village-level workers and the communities. Although this allowed a degree of flexibility, it is likely to have introduced some inclusion (as well as exclusion) errors.

Technical solutions

A low-cost shelter design was developed using low 1m walls and a bamboo-framed and grass-thatched roof. With time it was recognised that there was a need to preserve the grass for animal fodder, so the roofing material was replaced with locally produced Mangalore clay tiles.

The dimensions of the shelters built were approximately 4m x 2½m. Although this provided a covered area of only 10m^2 for a family, these dimensions were carefully selected to focus on earthquake safety. A larger span would have required significantly more materials to ensure the same level of safety.

The distribution of construction materials was phased to ensure that buildings were built safely:

- First, a shallow foundation was built. When this was complete the cement for the walls was distributed.
- Walls then had to be built. When these were complete, walls and roofing materials were distributed.

After the initial shelters were built, issues were found with the roofing and an upgrade programme was required. This involved distributing four pieces of bamboo (1½m long) to brace the roof.

The distributions of materials were accompanied by the training of local masons and carpenters, to mobilise the communities and raise their awareness of seismic-resistant construction. A significant amount of work was required to ensure that people correctly braced their shelters and to explain that once braced, the buildings would be stronger and safer.

'What the international NGO saw as normal professional procedures, the local organisation saw as meaningless bureaucracy. The international NGO had bent its own rules in favour of the local NGO to such an extent that our financial consultant became highly concerned… But ultimately there is no doubt that the international NGO's real achievement in the Gujarat response was its link with local NGOs and the temporary housing project'.
– Evaluation by the Disasters Emergency Committee (the donor)

Working with partners

The way in which the international NGO was able to work in partnership with a strong local network of NGOs was one of the strengths of this project. However, the relationship at times became strained, in part due to the different working methods and the speed at which the working relationship was set up.

The international NGO had internal rules and donor requirements for paperwork and processes for accountability. The local organisations saw much of this as overly bureaucratic. These organisational differences were compounded by high staff turnover.

Many of the procedures, logistical and financial controls were loosened. However, the shelter programme was very effective according to both internal and external evaluations.

By working through a network of local NGOs, it was possible to mobilise large numbers of people.

These school buildings were adapted from the transitional shelters. The low walls reduce the risk of masonry falling on occupants during future earthquakes.

'Generally, the concept of working through a local NGO partner is better than working directly, particularly in relief distribution. INGOs have less detailed knowledge about the affected people's needs. On the other hand, local NGOs may lack the skills to meet donors' requirements. Collaboration between INGOs and local NGOs, thus, is mutually benefiting'.

- Project evaluation report

Implementation and logistics

Within the first week, a base camp and warehouse were set up in Bhuj and a liaison office was established in Ahmedabad. Tents, plastic sheeting, some blankets, jerry cans, children's clothes and WHO medical kits were procured from outside India. They were brought to Bhuj by four chartered flights. Blankets and some tents were procured from Bangalore and Kanpur and were brought to the Bhuj warehouse through transport agencies.

Relief materials were delivered to the network of NGOs. Its members collected the relief materials at the warehouse and transported them to the villages for distribution.

Construction materials were procured through the local NGOs' procurement team. Two entire trains were chartered to bring in 265,000 bamboo poles from Assam. As the Bhuj train station did not have freight handling capacity, the station had to be closed for 24 hours while the trains were unloaded. It took 120 trucks to transport the materials onwards to temporary stores in the village from where they could be distributed.

The remaining bamboo was procured from Nagpur and brought to Bhuj through trucking companies.

Roof tiles are traditionally produced by small-scale suppliers. In order to purchase the 12 million required, it was necessary to send a finance officer to pay multiple roadside suppliers.

Wooden purlins, rafters and patties were procured from the timber merchants and transported by truck, in some cases directly from the sawmills.

Record keeping for procurement, supplies and distribution was not very good. This was the result of the complex and very rapid procurement of multiple items. In addition, the multiple partner organisations had different working practices. The resulting programme created difficulties for the auditors, but was effective in providing shelter for a large number of people.

Materials list

Relief items distributed in 259 villages until 31 March:

Relief items	Quantity
Tent	847
Plastic sheet	8,835
Blankets	127,515
Bucket	3,728
Jerry can	1,328
Children's clothes	7,237

Total distribution of construction materials from 1 May to 15 October 2001:

Relief items	Quantity
Cement	72,684
Bamboo	422,217
Woven mats	149,878
Wooden spacers	9,689,295
Wooden rafter	178,401
Wooden purlin	39,250
Roof tile	12,114,483
Roof ridge	325,600
Iron wire	52,22
Mild steel rod	97,532

B.4 Indonesia - Aceh - 2004 - Tsunami and earthquake

Case study: Shelter or housing?

Project type:
Emergency non-food item distribution
Land rights advocacy
Housing

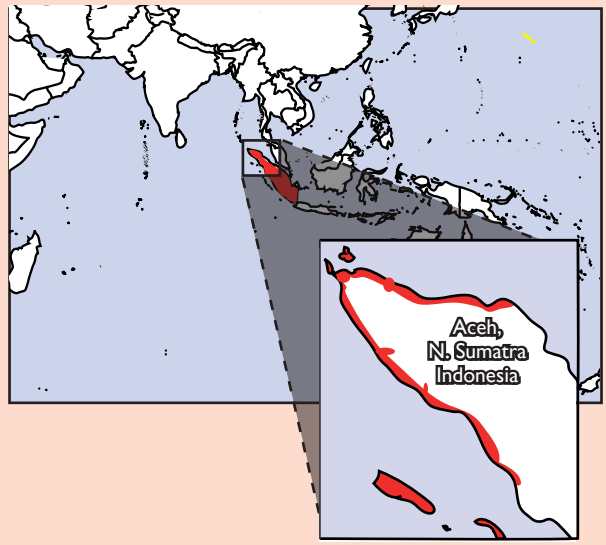
Disaster:
Earthquake followed by tsunami

No. of houses damaged:
252,000 destroyed or partially destroyed, all within 5km of the coast

Project target population:
1,564 houses created in 28 villages in seven regions

Occupancy rate on handover:
95%, compared to 79% for all of Aceh

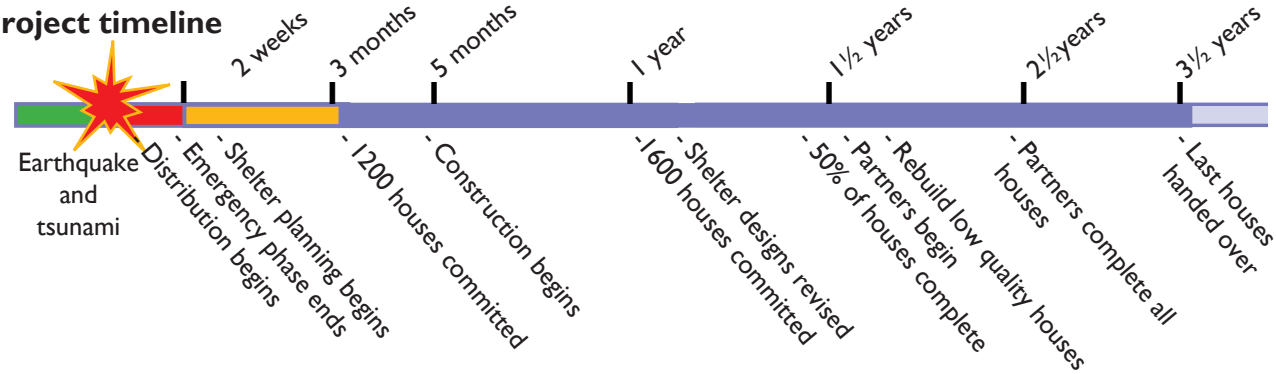
Shelter size
36m^2 per family, all with additional water/sanitation facilities



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 the challenges in 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 to build 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.

Project timeline



Strengths and weaknesses

✓ The project was able to adapt from community-built transitional shelters to durable houses constructed by implementing partners and contractors.

✓ There was success in negotiating land for families displaced by the conflict and affected by the tsunami.

✓ Lessons were learned from mistakes made by other organisations. The large budget allowed mistakes to be rectified.

× Major structural changes were made to the house designs without full consideration of the logistical, technical and managerial implications.

× It was not possible to get the right quantity and quality of materials as a result of a huge demand.

× Unrealistic expectations were raised among beneficiaries. This led to challenges with community relations during the programme. Because of the budgets available to NGOs there was competition for beneficiaries and communities. Beneficiaries had a choice of organisations and designs.

× Lack of management staff available with experience of construction projects led to an unexpectedly large amount of management time being required.

× The phrase 'building back better' was interpreted in many ways. The emphasis should be to 'build back safer' and reduce future risk.

Photo: Joseph Ashmore

In the first weeks after the tsunami, people found shelter in large collective tents (left), squatted buildings (right), tents, rented housing or with friends and family. The government built transitional living centres (centre).

Before the tsunami

The Indonesian state of Aceh is a densely forested state in the north of the island of Sumatra. The majority of the population live along the coast and the main access is by sea or along the coastal roads.

Aceh has had intermittent periods of conflict since 1976. In May 2003, the government of Indonesia declared martial law in the province. As a result of the conflict there was limited involvement of non-governmental organisations in the province.

After the tsunami

The earthquake that struck on 26 December 2004 was one of the largest ever recorded and damaged many of the larger concrete-framed buildings in Aceh. The ensuing tsunami caused extensive damage in many of the countries in the Indian Ocean. The province of Aceh was the worst hit, due to its proximity to the earthquake and because the majority of the population live in low-lying coastal areas.

Following the tsunami, the majority of emergency shelter needs were met in the first weeks by the Indonesian military, Indonesian organisations and beneficiaries themselves. This was due to logistical challenges and the fact that foreign access was limited by infrastructure damage and travel restrictions resulting from the ongoing conflict. Shelter was provided in collective tents, existing buildings, individual family tents, by use of plastic sheeting and by families moving inland to where the damage was not as bad.

Throughout the response and reconstruction, government housing policy had a strong impact on the response. Policy required that the shelters that were built create a minimum covered area of 36m^2. The only official transitional response was the building of transitional living centres, also known as 'barracks'. These were long, timber-framed and panelled buildings on stilts with plywood separation between families.

Technical solutions

Traditional coastal Achinese shelters are entirely made of local timber and have thatched roofs. They are often on stilts to keep them off the ground. More recent construction has a concrete plinth and low brick walls, with a timbered superstructure built on top. The roof is covered in corrugated iron.

This project began building semi-permanent shelters based on local designs. These had concrete and brick foundations and low brick walls, and were topped with timber frames, a corrugated iron roof and timber panels.

About ten months after the tsunami, the house model changed to a reinforced concrete-framed structure with brick walls and a wood-framed roof. It included over 50 separate components, as well as toolkits. This was seen as 'building back better', although there were some safety concerns where builders had taken shortcuts.

This project was based in five distinct districts, with different designs and implementation methods developed in each district.

As part of the agreements reached with the communities, the first semi-timbered shelters, which had provided transitional shelter for as long as two years, were upgraded at the NGO's expense once all shelters had been completed.

Photo: Predes

Road shown two years after the tsunami. Access was initially difficult along much of the west coast of Aceh.

Who builds?

Planning of the programme started approximately six weeks after the tsunami, as a community-led construction programme to build shelters similar to those that many families had before the disaster. The programme sensibly aimed to build skills and capacities within the villages, create livelihood opportunities and cultivate a higher level of ownership by encouraging self-build approaches.

The scale of the construction in Aceh was significantly greater than had ever before been experienced in the region, requiring over 109,000 houses from a building industry that had only built a fraction of that number. As time passed and villagers started to regain their livelihoods, NGOs found it harder to find a workforce from the villages.

Many people built their own shelters using reclaimed materials.


Photo: Joseph Ashmore

One of the completed shelters in Sigli, Aceh

In 2006, as local community contractors and other NGOs became available in Aceh, the NGO started to work with implementing partners in the local community and contractors to construct the remaining houses. They were finally able to complete construction by the spring of 2008, just over three years after the tsunami.

Despite the challenges, community-built houses were perceived by the community as being better at resisting minor earthquakes because 'we were able to monitor the construction quality'. Any construction project in post-tsunami Aceh had to have a very high level of monitoring by INGO staff and the community or there would be poor construction undertaken by the contractor or the beneficiaries. For example, the construction of 86 houses in three communities in Aceh Besar employed nine staff members who were in the field every day.

'The house is a base for people to operate their daily lives [from]. The construction of a house is an essential shell to secure early livelihood recovery, as it gives privacy, stability and a physical asset. The shell needs to be filled with life to make it a home'. – Internal project report

Logistics and materials

Following the tsunami, roads were severely damaged in three of the five project areas, although access improved during the programme. In some villages, bridges, roads and drainage had to be built before work could start on the houses. The community-built housing programme was quicker and more successful in the two areas where access to materials from the non-affected city of Medan was easier.

Logistics delays, combined with raised expectations, led to villagers becoming frustrated by waiting.

Why did the programme change?

The programme changed from self-build, semi-timbered shelters to contractor-led reinforced shelters for several reasons, many of which were specific to the post-tsunami environment of Aceh.

The availability of funds and the number of different organisations operating in Aceh led to competition between organisations, which served to raise expectations of what could be built. The government in Aceh strongly encouraged the construction of durable shelter, and agencies, eager to fulfil their early promises, started to implement significantly more complex construction programmes than originally intended.


Photo: Joseph Ashmore

Obtaining good quality building materials remained problematic. These bricks decayed rapidly in the rain.

The availability of materials strongly impacted the shelter designs used. There were significant challenges in obtaining legal timber locally, while importing timber was slow and problematic. Strangely, the amount of wood burned to make bricks may have had a larger environmental impact on the local forest resources than using timber would have done.

Sample bill of quantities for one of the finished houses:

material	quantity
Mountain stone – foundations	12m^3
Sand	20 m^3
Gravel	14 m^3
Filling Soil	28 m^3
Rebar 12mm x 10m	61 pieces
Rebar 8mm x 10m	50 pieces
Tie wire	4 rolls
Nail 1"	1 kg
Nail 2"	15 kg
Nail 3"	15 kg
Nail 4"	12 kg
Bolt diameter ½"x6"	45 pieces
PVC gutter no hole	2 pieces
PVC gutter 1 hole	2 pieces
Gutter hanger plate	32 pieces
Gutter side bracket	4 pieces
Gutter connection	2 pieces
PVC glue	1 tube
Plywood/ 8'vx 4'vx 4 mm	30 pieces
Timber - concrete formwork 2 x 20cm x 5m	28 pieces
Timber-concrete formwork 2 x 5cm x 5m	15 pieces
Timber - gable 2 x 20cm x 5m	20 pieces
Timber - facia board 2 x 20cm x 5 m	8 pieces
Timber 5 x 10cm x 5m	20 pieces
Timber 5 x 7cm x 5m	20 pieces
Timber 4 x 12cm x 4m	6 pieces
Timber 5 x 5cm x 5m	25 pieces
Cement (40 kg)	135 pieces
Masonry brick	6200 pieces
Zinc roofing sheet	46 pieces
Zinc plate for ridge	4 pieces
Zinc roofing nails	4 boxes
Door hinge 6"/4"	28 pieces
Window hinge 3"	14 pieces
Window wing	14 sets
Window lock 2.5"	2 set.s
Door lock 4"	10 sets
Door/window handle	7 pieces
Door handle with key	4 pieces
Door screw no. 7	2 boxes
Door screw no. 6	1 box
Window screw no. 5	2 boxes
Paint for walls / waterbase (25 kg/can)	4 cans
Paint for timber frame/oil base (5 kg/can)	8 cans
Door frames	4 pieces
Window frames (single)	1 piece
Window frames (double)	3 pieces
Door panels type A	2 pieces
Door panels type B	2 pieces
Window panels type 1	1 pieces
Window panels type 2	3 pieces

B.5 Indonesia, Jogyakarta - 2006 - Earthquake

Overview of the response

Summary

At 6:30 a.m. on a Saturday morning an earthquake measuring 6.0 on the Richter scale struck the south-eastern corner of the province of Jogyakarta in Central Java. The 53 seconds of violent activity killed 5,000 people and decimated over 8,000 rural and peri-urban sub-villages, leaving over 2 million people homeless.

The largest response was a national response from a diversity of private actors and organisations. This was backed up by an international response, which was accelerated by the preparedness activities that were already ongoing in anticipation of the eruption of nearby Mount Merapi. The international response was coordinated through the Emergency Shelter Cluster that was activated locally.

The case studies included in this section involve two organisations that both responded in phases: an initial distribution of emergency items, followed by a transitional shelter response. Both organisations used cash grants, either to individuals or to local organisations, to implement the transitional shelter programmes.

Before the earthquake

As there had been no major earthquake in the area 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. For example, one international NGO's 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 the damage to physical infrastructure, resulted in comparatively low levels of damage to the social infrastructure. This, combined with the disaster's proximity to the relatively unscathed major city of Jogyakarta (a major hub of university learning and NGO activity), provided a massive national capacity for the INGO movement to draw upon and work with.

In the early stages of the disaster response, international funds and resources appeared extremely limited for such a vast affected area.

Few other sectors were as badly affected as the shelter sector. Most families used private wells and septic tanks, which remained largely functional. This, along with high general hygiene levels, greatly reduced the need for water, sanitation or hygiene assistance.

The Jogyakarta earthquake response became primarily a shelter disaster, and over 50% of the over 200 agencies on the scene 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 in the rubble. The combination of people's desire to stay close to their remaining possessions and (mainly) agricultural workplaces, meant that 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 to move people 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 limited apparent 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

A total of about 25 million sticks of bamboo were used in the response. Some 5 million sticks were used by the Shelter Cluster, about 3 million by the Indonesian government and 10-15 million by other communities.

However, management of the growing clumps of bamboo was not integrated into the transitional shelter programmes. In response to demand, much bamboo was clearcut or harvested using unsustainable techniques. Depending on the type of bamboo and how it was harvested, some areas will take three to five years to return to their original stock. Other areas may take ten 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.

There is a strong tradition of bamboo-based construction in Jogyakarta.

A transitional shelter strategy was adopted by the Shelter Cluster members.

Bamboo jointing details

Bamboo being bound with string

Electric power drills used to drill holes in the bamboo so that it can be pegged

Prefabrication of a wall panel

Connecting a vertical post to the foundation

Foundation pads cast with bamboo to connect them to the frame

Photos: IFRC

Public information messages distributed as part of the response

B6 Jogyakarta - 2006 - Earthquake

Case study: Cash and transitional shelter

Project type:
Community-built transitional shelter
Self-build, cash grants for materials
Skills transfer through volunteers living in communities

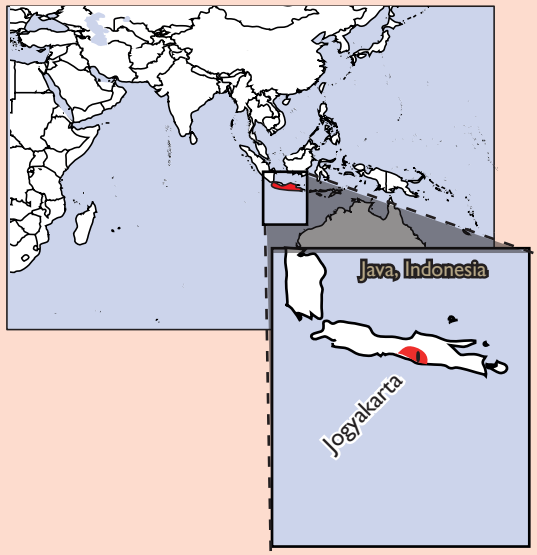
Disaster:
Jogyakarta/Central Java earthquake, 24 May 2006

No. of houses damaged:
303,000 destroyed or seriously affected

Project target population:
12,250. 22.5% of UN/OCHA-recorded shelters

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

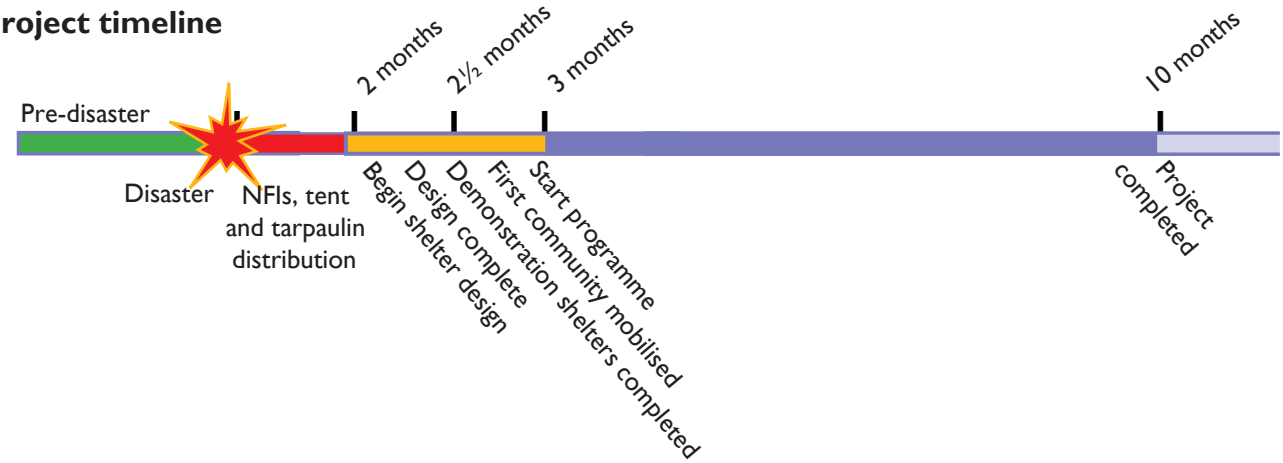
Shelter size
4 x 6m^2 (minimum 2m height)



Summary

This organisation 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 programme supported by hundreds of volunteers and extensive instructional and promotional materials, including short training manuals, video compact discs, posters and radio advertisements.

Project timeline



Strengths and weaknesses

✓ Emphasis on community participation empowered communities in their reconstruction process and resulted in community engagement and ownership of the programme.
✓ The project was able to build on the Javanese self-help culture of 'gotong royong' ('working bee').
✓ The project sucessfully used materials that kept funds in the local economy.
✓ Maintaining volunteers to live within the communities was essential for effective knowledge transferral.
✓ Cash grants gave communities responsibility and engagement with the programme.
✓ Once new permanent houses were inhabitable, transitional shelters were used as kitchens, sheds, small shops, workshops, storehouses, etc.

× Environmental groups expressed concerns about the widespread impact on Java's bamboo forests. This could perhaps have been alleviated or averted by altered procurement mechanisms.
× A supply of treated bamboo would have greatly extended the usable lifespan of these structures (from two years to 25 years) and enhanced community recovery.
× Faster implementation, scale-up and scale-down of the shelter programme would have reduced the problems of overlapping with permanent reconstruction.
× Without the incentive of further funding, minor issues of accountability and transparency occurred with the final installment of funding. Clearer contracts, penalty clauses, training or incentives may have alleviated this.

A completed transitional shelter built through cash grants

A transitional shelter built on the site of a destroyed house

Beneficiary selection

Small cash grants were given out via traditional mutual support mechanisms to neighbourhood groups to buy tools and basic materials to build temporary shelters.

Meetings were held with each group to discuss the project and to sign a contract with the community. In order to participate, each neighbourhood (20-50 houses) had to form a shelter committee that had to include a head of the group, a treasurer (who had to be a woman) and a secretary. The positions could not be held by local officials or their family members.

The committee was responsible for the selection of beneficiaries, who could be anyone currently living in a tent or under a tarpaulin, with a house unsuitable for habitation. Priority was given to vulnerable people such as widows, orphans, disabled people, pregnant women, the sick and the elderly. Funds were delivered through group bank accounts in three to four instalments. The community contributed labour and materials recovered from the rubble.

Design process

This project aimed to empower community members to rebuild their lives, starting with the construction of a transitional shelter. The transitional shelter design was developed through an understanding of locally available materials, community needs and the capacity and objectives of the organisation.

It took one month for the design process, one month for community preparation and demonstration shelters, and one week to build 740 'model' houses through a public competition.

The competition involved three categories and offered prize money that went to the neighbourhood for:

- the most number of houses;
- the most beautiful houses; and
- the involvement of women.

The programme was rolled out over seven months, with 12,250 shelters built in 761 communities. Shelters cost under US$ 200 per unit.

Community-built shelter

Beneficiaries were strongly encouraged to follow the design, but not compelled to. In some cases people ignored or modified the design, such as in Delingo, a remote community with widespread construction skills and local construction resources.

The volunteers/supervisors were essential to guide and support good construction. The more the volunteers were confident and engaged in the process, the more the construction followed the design and was of sufficient quality. Variations were not problematic as long as the general principles were followed and the essential points (such as building size, safe connections, etc.) were satisfied.

Delay in project startup

The organisation was initially hesitant to give cash directly to beneficiaries. If there had been quicker institutional support for the project, it could have been scaled up faster and reached more people.

Community knowledge

Community levels of knowledge about the use of bamboo varied. The more urbanised the environment, the lower the level of traditional knowledge in the community, which led to a lower quality of bamboo construction.

The rural mountainous communities recovered relatively quickly, despite higher levels of damage from the earthquake and higher levels of general poverty. One of the reasons for this was that many locals had worked in the construction industry prior to the earthquake.

The interior of a transitional shelter

Transporting bamboo mats to a construction site

Implementation partners

Throughout this project, the organisation worked with national volunteers, two local universities, undergraduate architecture students, a training team, NGO facilitators/trainers, an implementation team, and a bamboo expert with experience in Venezuela and Flores, and communities in Jogyakarta and Central Java.

The local universities were involved and helped to:

- develop technical inputs for shelter design and messages;
- develop posters, pamphlets, t-shirts, etc.;
- train students to deliver 'build back better' messages under staff supervision; and
- set up mobile construction clinics.

The local media also got involved, reinforcing best practice shelter and construction messages on the radio, television and in print.

'Achieving good recovery and risk reduction outcomes in shelter is not about building structures. It is about building trust with communities'.
- Recovery coordinator for the programme

Working with volunteers

The shelter programme mobilised volunteers as community trainers, with two volunteers per neighbourhood. The volunteers first went through three days and nights of hands-on training making straw models and a mock-up frame, as well as finance training and team-building exercises. They then worked with communities on selecting and buying materials, the technical aspects of working with bamboo and building the shelters.

Community training lasted up to one week. During this time the volunteers and the community built the first shelter together, with supporting media (a step-by-step guide, an informative video about using bamboo in construction, safe construction advertisements and a booklet). Volunteers lived in the communities in a tent or transitional shelter and worked with the communities every day.

Working with volunteers allowed a large-scale programme to be set up. The volunteers were often enthusiastic and very willing to help, but some had a low level of confidence or experience. This led to some challenges in ensuring adequate quality control.

Volunteers were paid a small stipend and supported with cooking equipment, sleeping gear and field support. A weekly reflective learning/training session was held.

The Shelter Cluster design guidelines included seismic resistance, lasting up to two years, using materials that could be recycled and that cost under US$ 200.

Ongoing use of shelters

In the densely populated area of Klaten, the transitional shelters were eventually demolished to make room for permanent housing.

In the rural areas, the majority of the transitional shelters were still being used after permanent shelters were built, but for purposes such as storage sheds, shelter for cattle and livestock, or for small restaurants.

As per the requirements of the cluster-wide transitional shelter design, untreated bamboo was used (which deteriorates after two years). If treated bamboo had been integrated into the programme, the shelter structures could have been safely used in communities for up to 25 years.

Resource management

The shelter programme built 12,250 transitional shelters that used more than 100 culms of bamboo per shelter, using a total of more than 1.2 million culms of bamboo.

To avoid deforestation of the bamboo stock, this project could have set up purchasing control mechanisms to manage the bulk procurement of bamboo that controlled quality, environmental impact, procurement methods and treatment of the bamboo. It would have also been possible to allocate money to reforestation programmes.

Materials	Quantity
Bamboo mats 6 walls, 3 ceiling, 1 door	10 mats
Round poles (for columns) 3' diameter, 3m long	12 poles
Round poles (for beams and roof joists) 7.5cm diameter, 3m long	11 poles
Timber for fixing the mats	7 beams
Reinforced plastic sheet	3m x 15m
Nails 5cm, 7.5cm and 10cm	2.2 kg
Wire	1 kg
Hinges	3 units
Lock	1 units

Public information was a critical component of the project.

B7 Jogyakarta - 2006 - Earthquake

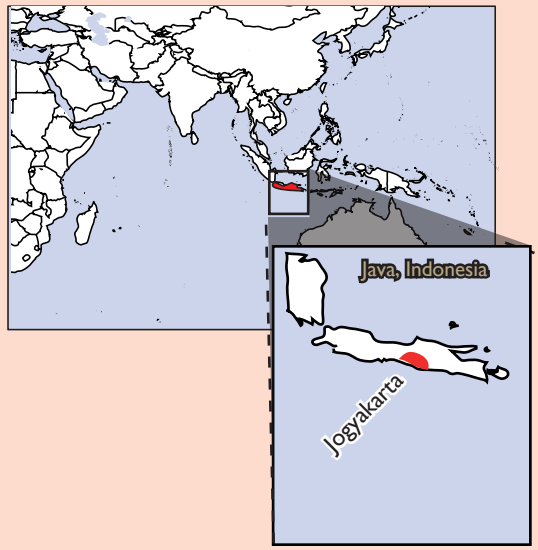
Case study: Emergency and transitional shelter

Project type:
Non-food item distribution (plastic sheeting)
Emergency shelter enhancement programme
Public outreach and information programme

Disaster:
Jogyakarta/Central Java earthquake, 24 May 2006

No. of houses damaged:
303,000 destroyed
240,000 seriously damaged
(mostly rural or peri-urban communities)

Project target population:
Distribution of plastic sheeting: 75,000 families
Emergency shelter enhancement: 26,500 families
Transitional shelter programme: 2,000 families



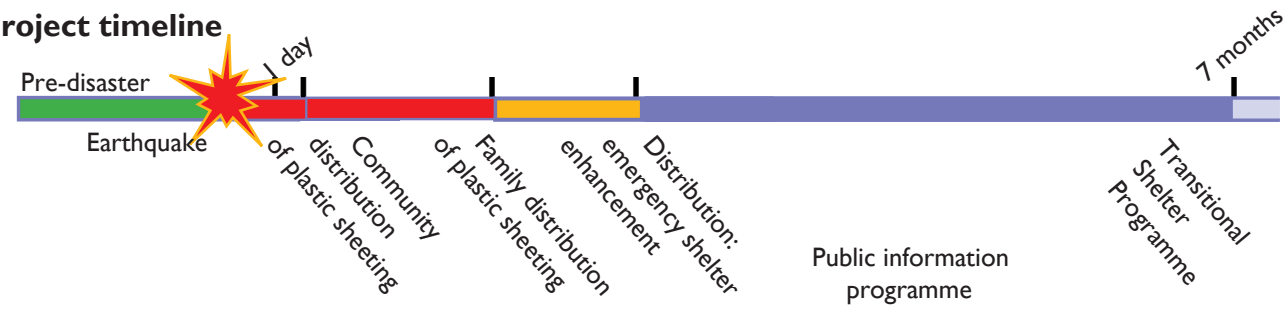
Occupancy rate on handover:
External evaluation shows close to 100% usage and correct targeting

Shelter size
Plastic sheeting: Phase 1, 20-30 sheets per village. Phase 2, one 4m x 6m sheet per family
Emergency shelter enhancement programme: walling and floor mats for 4 x 6m plastic sheeting
Transitional shelter programme: 24m^2 bamboo transitional shelters

Summary

This organisation implemented a four-part emergency shelter response that included: 1) distribution of tarpaulins for emergency shelter based on a broad vulnerability assessment; 2) a 100% infill project; 3) an emergency shelter enhancement programme of tools, walling and bedding for 26,500 families, a broad public outreach and safety information programme; and 4) a small grants programme for the design and construction of transitional shelters. All programmes were designed in coordination with the Shelter Cluster, where the organisation played a lead technical advisory role.

Project timeline



Strengths and weaknesses

✓ As early capacity was limited, a partial distribution programme across a large affected region followed by a 100% distribution infill program worked very well.
✓ The delivery speed of broad-based tarpaulin distribution effectively avoided the creation of IDP camps.
✓ By communities' request, distributions were delivered to the community level as opposed to individuals, with communities taking responsibility for internal distribution.
✓ Cash grants gave communities responsibility and engagement with the programme.
✓ Procurement of locally manufactured woven bamboo wall sheet was far more successful than conventional tender-based procurement methods.
✓ Running the entire programme through local partners worked extremely well.
× The shelter enhancement programme could possibly have been improved by providing flooring and wall framing material (not just wall cladding and sleeping mats).
× Ongoing support and expansion of successful transitional shelter projects would have been desirable and useful.
× Faster bulk procurement and distribution of tarpaulins would have been desirable.

Photos: Dave Hodgkin

Plastic sheets distributed as part the first phase of the response were often used to make shared temporary shelters.

Distribution - plastic sheeting

The organisation implementing this project was one of the few agencies with full-functioning capacity at the time of the earthquake. It started its first distributions ten hours after the earthquake.

As rain was falling each night there was an urgent need for shelter, but supplies were too limited to supply one tarpaulin per family.

A broader distribution through local partners was conducted. Each village was provided with sufficient tarpaulins to ensure that the sick, the weak, the young and the elderly were adequately under cover. In the first days, villages joined tarpaulins together to form large communal shelters that housed the whole village at night (up to ten times the expected number of beneficiaries).

As funds and capacity from other organisations arrived, the project was reduced to an infill programme, returning to previously assisted villages and supplying 48m^2 of plastic sheeting per family (two 6m x 4m sheets).

At the request of local communities and in support of the local self-help tradition of 'gotong royong', all distributions occurred at the community level instead of the individual level. All needs assessments and distributions were conducted by local implementing partners. Communities were responsible for beneficiary selection.

Because local NGOs conducted all distributions and evaluations, the amount of human resources that the international NGO itself had to deploy was extremely limited. At its peak it employed only six shelter-specific staff, and focused its resources more on logistics and partnership support.

Expansion of the emergency shelter programme

Early analysis of the progress of community recovery showed:

- the use of tarpaulin for both roofing and walling, resulting in limited undercover space;
- sufficient reclaimable timber for temporary shelter framing, but insufficient material for wall cladding;
- a pressing need for tools and equipment for cleanup and reconstruction; and
- a shortage of clean sleeping mats.

The rush by affected families to reconstruct permanent houses raised a number of advocacy concerns. These included issues about the quality of construction, health and safety, treatment of the asbestos within the rubble and the construction of shelters in precarious positions.

The emergency programme was followed by an Enhanced Emergency Shelter programme, which provided:

- woven bamboo wall sheeting (gedek) to affected communities to ensure that each family had sufficient material to build walls for their emergency shelter;
- combined community toolkits for clean-up and reconstruction; and
- sleeping mats.

It also launched an advocacy and public outreach programmes to address safety and health issues.

Photos: Dave Hodgkin

A collective shelter built by beneficiaries using distributed plastic tarpaulins

The extension of the emergency programme provided additional plastic sheets so that each needy family received one sheet.

Transitional shelter grants

As a final part of the organisation's emergency shelter programme, a programme was started to support the transition into temporary housing. The transitional shelter programme was conducted in accordance with the Emergency Shelter Cluster guidelines that had been developed locally following the earthquake.

'The best we can do as shelter managers, is to be responsive and adaptive to the changing needs of the affected community;providing minimalist but strategic and incremental inputs into the communities' natural path from inadequate to adequate permanent shelter'.

Cultural, environmental and cost concerns led to the creation of a set of common guidelines based on traditional bamboo frame construction with clay roof tiles and woven bamboo wall cladding. Flexibility in design to allow for innovations was encouraged.

This programme provided eight cash grants to local community organisations/businesses and groups, to work with communities already serviced by the emergency shelter distributions. These were based on a tender process that resulted in a cost of US$ 100-300 per shelter.

As well as housing 2,000 families and improving the capacity of a number of local partners, this programme produced a range of well-documented transitional shelter solutions as potential examples for further expansion or adoption by other agencies.

Public outreach and advocacy

The final aspect of this post-earthquake shelter response was a public outreach and advocacy programme, where the organisation provided technical advice to the Shelter Cluster. This led to the formation of technical working groups. One group working on public outreach produced posters on a range of issues including:

- safe clean-up;
- safe siting of temporary shelters;
- safe reconstruction;
- safe handling of asbestos and dust;
- building next to hazardous buildings; and
- an introduction to simple bamboo and concrete construction techniques.

The organisation led a cluster working group to design and print posters. These were then distributed by the local government and by Shelter Cluster members as a part of shelter material distributions. In total, four batches of 20,000 posters each were distributed to the disaster-affected population.

The public outreach working group went on to develop a range of public outreach and advertising materials to promote safe reconstruction.

Materials	Quantity
Emergency shelter programme	
Plastic tarpaulin 6m x 4m	20-30 per sub-village (200-300 families)
100% infill programme	
Plastic tarpaulin 6m x 4m	1 per family
Enhanced emergency shelter programme	
Woven bamboo sheeting 2m x 3m	6 sheets per family
Tikka matts	2 per family
Toolkits	
1) Clean-up	Distributed per village
2) Reconstruction	
3) Village level	
Innovative T-shelter grants	
Cash grant based on tender process	US$ 100-300 per shelter
Public outreach programme	
Public outreach posters	4 batches of 20,000 posters

Grants were provided to build transitional shelters. Many different and innovative designs were built.

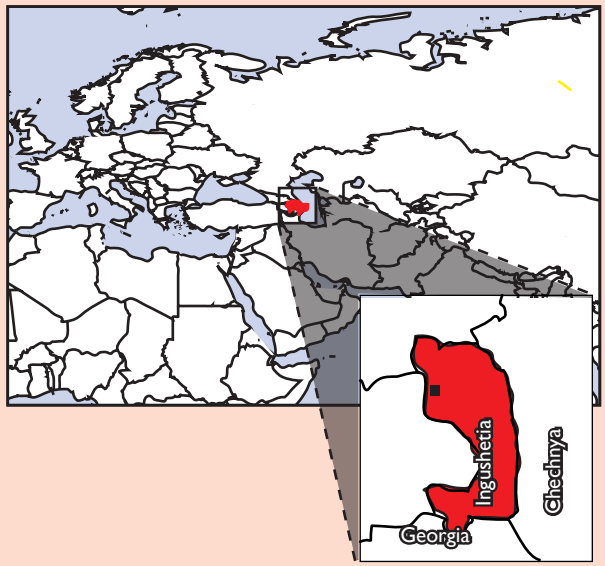
B.8 Russia, Ingushetia - 1999 - Conflict - People displaced

Case Study: Cash for shelter - host families

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

Disaster:
Internal displacement of civilians following 2nd armed conflict in Chechnya,1999

No. of people displaced:
At the peak of the crisis, 213,000 people fled to neighbouring Ingushetia. Up to 150,000 people were privately accommodated by host families.



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

Occupancy rate on handover:
100% of the host families accommodated on average of five IDPs from Chechnya (subject to corruption, which was carefully screened out).

Shelter size
The cash grant was equivalent to an average of one month's salary in Ingushetia.
A 21m^2 minimum net floor area was strongly recommended. The shelter consisted of two rooms, one corridor and an external latrine.

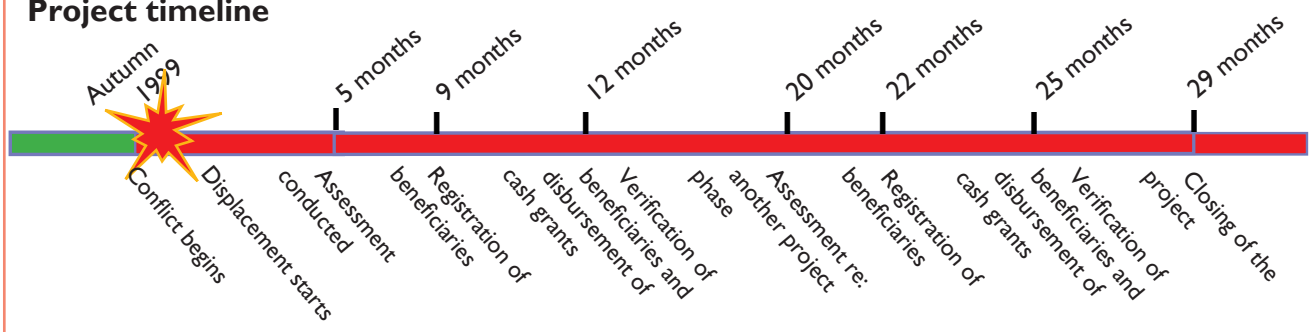
Summary

An international donor, in close cooperation with the international leading agency for shelter assistance in Ingushetia, provided cash grants to every family that hosted 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 achieved though the provision of cash grants to all registered host families in Ingushetia.

A one-off cash grant, roughly equivalent to one month's income, was given with no restrictions to each host family. 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 the winter of 2000/01, it was decided to implement a second phase, since the situation for displaced people in Ingushetia had not improved.

Project timeline



Strengths and weaknesses

✓ No eviction of IDPs during the winter months of 2000/01 and 2001/02 were reported.
✓ No abuse during cash distribution or any security incidents occurred despite a rather tense security situation.
✓ The programme's level of transparency achieved high acceptance among beneficiaries and local authorities.
✓ Professional cooperation with the Russian postal service (Ingush branch) allowed for a timely and accurate cash disbursement.
✓ The significant influx of liquid cash supported the local economy.

× The high number of beneficiaries in different databases required an intensive verification process.
× Implementation of the 2nd phase during the following winter was exposed to severe fraud attempts, as some individuals had manipulated official documents in order meet the eligibility criteria. However, the fraudulant cases were sorted out and expelled from the beneficiary lists before payment was released.
× In view of the scope of the project (the entire Republic of Ingushetia) an evaluation of the project was recommended to reveal detailed information about its effects and impact.

The project worked with host families.

Context

The conflict in Chechnya started in 1999, forcing 213,000 people to move to the Republic of Ingushetia. At one stage in early 2000, there was one displaced person from Chechnya for every Ingush citizen.

Almost two-thirds of the IDPs were accommodated by Ingush host families. This was possible because of close family and religious ties between the two countries.

In the spring of 2000, there was some evidence that IDPs had been evicted from private accommodation. This was commonly as a result of financial pressures on families, many of whom had been hosting the IDPs for more than one year.

This project recognised that staying with host families was psychologically better for IDPs than living in camps. It also sought to encourage the solidarity effort of the Ingush population. As a result, the project aimed to support host families with economic incentives to encourage them to continue hosting the IDPs.

Assessments were conducted in the spring of 2000. These confirmed:

- the appropriateness of the cash for shelter approach;
- acceptance among potential beneficiaries and authorities; and
- the readiness of partner organisations to provide security and logistics.

Eligibility criteria

A host family was eligible for the cash grant when they:

- presented official registration documents proving that they an Ingush resident; and
- presented a Chechen IDP's temporary registration document with the same address and a registration date within a given time period.

Implementation

Registration - The registration of beneficiaries was based on United Nations and the Federal Migration Service lists. The two lists were combined and filtered. The resulting beneficiary lists were cleared.

Verification - To ensure that the registered beneficiaries were hosting

By supporting host families with one off cash grants, the project aimed to avoid evictions.

IDPs, monitoring teams were sent to the registered beneficiaries' address.

Public information - The intention to implement a cash project was initially announced to the Russian federal government as well as to the Ingush government and the humanitarian aid community. Regular reports on local television kept the population updated on the programme and its progress. Detailed information on eligibility and lists of beneficiaries were posted at post offices and on the premises of local administrations.

Complaints - A complaints process involving the project management was originally not foreseen. Complainants were asked to refer to the Ingush government, which determined that 680 cases (out of 1,200) were eligible for compensation.

During the second phase in the winter of 2001/02, 6,100 faked documents were identified (out of 7,800 submitted). This was resolved as a result of close cooperation with the Ministry of Interior.

Payments - Payments were made by the Ingush branch of the Russian postal service. The postal service received a 1.5% commission for all transactions and personal invitations for beneficiaries. The cooperation was excellent in terms of reliability of payment procedures.

Cash for shelter collection point

Assistance provided - Each family received the equivalent of US$ 100 – the equivalent of an average monthly salary.

This project was accompanied by 32 small projects, such as equipment for computer classes and support to soup kitchens. The objective of this was to acknowledge the goodwill of the local community.

Staffing - The team consisted of two expatriate staff (a programme manager and a deputy programme manager), four local employees, two drivers and up to 24 part-time monitors and drivers. The staff were based out of two offices, one in Ingushetia and one in North Osetia.

Security - Movement was heavily restricted as a result of security restrictions on international staff. Small projects were visited by local staff.

Impacts - Although there were some signs of eviction reported among the international humanitarian aid community, no eviction of IDPs during the winter months of 2000/01 and 2001/02 was officially reported.

According to unofficial surveys, the cash grant was mainly used for daily needs as well as for the payment of electricity bills.

Due to the significant size of the two project phases, a total amount over US$ 2 million was indirectly invested in the local economy.

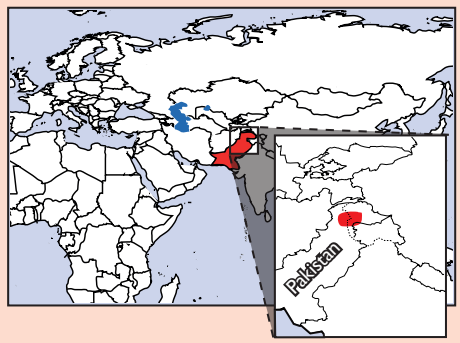
B.9 Pakistan - 2005- Earthquake

Overview of the earthquake response

Summary

The earthquake in northeastern Pakistan on 8 October 2005 killed an estimated 74.000 people and left over 3.5 million others with damaged or destroyed shelter. The earthquake struck in a mountainous region with winter only months away.

Of the many responses that took place, the two case studies included in this section illustrate emergency shelter programmes. Both were conducted to support people through the first winter. One of the projects involves the construction of transitional shelters with a phased delivery of materials, while the other involves the distribution of shelter materials and toolkits.



Population movements

The Pakistan earthquake of October 2005 occurred in a mountainous area just 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. An estimated 3.5 million people were left homeless and 600,000 houses had been damaged or destroyed, mainly 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 the mountains to regional and 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, and despite the oncoming winter, many people were able to remain on their land, often staying out of fear of losing their land entitlement. However, many 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, 1,800 families were verified to have lost their land through land slides. A further 4,000 families had not had the status of their land verified.

After the first winter there was a large-scale return of those who still had access to land, despite concerns of landslides because of summer 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 had previously rented or squatted.

The earthquake

There were many different responses to the large-scale shelter needs. During the first days following the earthquake many of the affected population, particularly those in locations where access was limited by damaged roads and difficult terrain, were not able to reclaim or gather materials to build themselves shelters. The longer-term policy for reconstruction adopted by the government was one of self-build, with distributions of approximately US$ 3,000 per family. In addition, regional training centres were set up to support construction practices that were more 'earthquake safe'.

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 came in the form of donations of goods from other parts of Pakistan, especially food and clothing in the first weeks after the earthquake.

A large-scale humanitarian response grew up over the first month. The key actors were 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 shelters;
- 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; and
- rubble removal.



Destroyed rural houses (left, centre) and urban houses (right) in Kashmir



Self-built shelters in Kashmir built using reclaimed materials only ten days after the earthquake



Left to right: Self-built shelters in Kashmir using donated iron and toolkits, an emergency shelter days after the earthquake, tents.





Above, assorted model shelters built in the North-West Frontier Province and Kashmir. Note that not all of these models (e.g. the domed shelter design in the centre) were culturally acceptable, sufficiently durable or spacious enough for people to live in.

B.10 Pakistan - 2005 - Earthquake

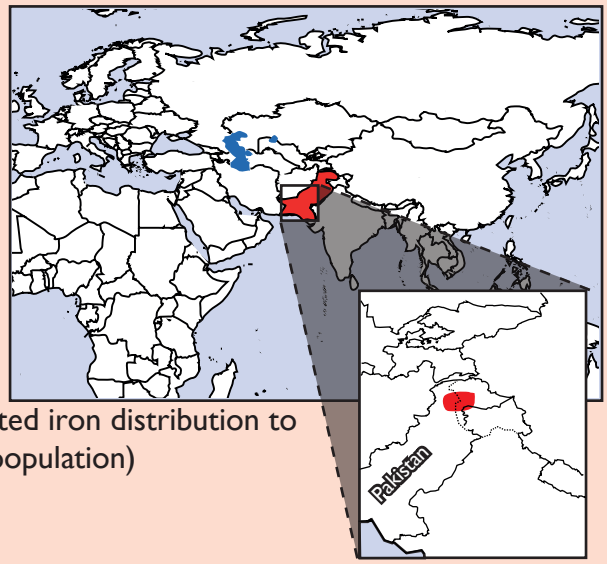
Case Study: Transitional shelter construction

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

Disaster:
South Asia earthquake, 2005

No. of houses damaged:
600,000 (over 90% in rural locations)

Project target population:
Shelter for 1,125 families, with additional corrugated iron distribution to 657 families (approximately 0.2% of the affected population)



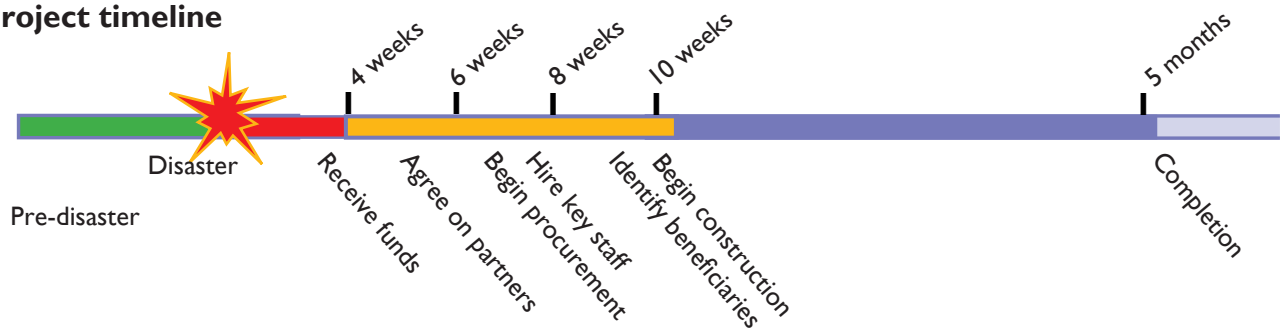
Occupancy rate on handover:
Over 95% occupancy for the first three months
Over 50 % for over two years
Nearly one-third of shelters still occupied after 2½ years

Shelter size
6.5m² - 10.5m² for people; 2m² - 3m² for livestock

Summary

A project to build transitional shelters according to the same 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 and working through partner organisations.

Project timeline



Strengths and weaknesses

✓ To ensure completion of shelters, carpenters were trained and corrugated iron sheets were withheld until the frame was complete.

✓ The technical assistance that accompanied the shelter distribution was well received.

- For the same amount of inputs, more families would have received corrugated galvanised iron under a materials distribution programme. However, fewer recipients would have used the material to construct shelters and the quality of construction would have been less sure.

- The use of village committees and local staff increased participation in the beneficiary selection and implementation processes. This offered greater equity but led to corruption and nepotism.

× The shelter design used sandbags for walls, but this did not gain cultural acceptance.

× The project had a high cost in terms of management and staffing time.

× Because they were built on the same plots, many shelters had to be later demolished to build permanent houses.


Photo: Albert Reichart

Materials distribution


Photo: Albert Reichart

A shelter two years after it was built

Targeting

The highest villages were targeted first as they had the worst of the winter weather. Within these villages, pre-existing conservation committees were asked to identify a limited number of vulnerable families. Once shelter had been provided to these families, an expanded list was then drawn up in consultation with the community.

As the project grew in complexity and the local staff became strained by the demands of their own situation and needs, outside staff were brought in to help manage the programme.

Technical solutions

A design was developed based on materials salvaged from traditional kacha houses. Additional materials were selected, taking into account weight considerations to reduce logistics challenges and risks due to earthquakes. Consideration was also given to how the materials could be later reused.

As the project areas were difficult to access, a prototype was built in Islamabad, the capital city, so that the shelter design could be shared with other organisations.

The shelter design had low walls and a sloping corrugated iron roof. It provided covered space for people and for their livestock (at one end). Its base was made of soil. On this base, walls were built out of polypropylene sacks filled with soil. The higher parts of the wall were made from sacks filled with lighter materials, such as crop wastes, straw or pine needles. The roof was made from corrugated iron fixed to a reclaimed timber frame. Additional sandbags were provided with the intention that they would be filled with lightweight material and placed against the corrugated iron as insulation.

In practice, only one quarter of the shelters were built using sandbags as walls or insulation. This was due to cultural acceptance, snow storms in January that made it difficult to fill the bags and the fact that the carpenters involved in the programme found timber walling quicker to build.

Roofing insulation was not commonly installed. This was because it was the last thing to build and was not seen as a priority by the people living in the shelters.

In an evaluation of the shelters, the most commonly mentioned disadvantage was that the shelters were too short and too small. However, the majority of occupants agreed that the shelters provided protection from the wind, rain and snow.

Implementation

Once individual Village Conservation Committees had provided their list of vulnerable families, a date was set for families to collect the first delivery of materials.


Photo Albert Reichart

A shelter (background) on the same plot of land as the permanent house under construction (foreground)

Villagers collected their shelter kits at the park office. The amount of materials included in each kit depended upon the family size. There was a toolkit for every five families.

After some initial issues with shelters not being completed, the roofing materials, including the most valuable part of the kit, the corrugated iron, were distributed only upon completion of the frame.

Most of the shelters were constructed by a team of two to four workers in less than one week. The project provided an allocation of five 'person days' of payment for the construction of each shelter. In practice, the technical assistance teams ended up constructing many of the shelters. Progress was periodically halted by deteriorating weather conditions, particularly in early January.

The major constraints in the implementation of the project were related to the procurement and transportation of materials and the weather conditions. The corrugated iron sheeting, which was used as the roofing for shelters, was difficult to procure in the required quantity. A tender for sheeting was placed in November but suppliers were not able to deliver. Eventually it was imported from India, which required high-level negotiations to relax the import restrictions into Pakistan for Indian materials.

Logistics and materials

For much of the duration of the project period, road access to the project sites was blocked by landslides. As a result, materials had to be driven to Muzaffarabad and then airlifted to the site. The final stage of transportation was by donkey and by foot.

There was a warehouse for each project area. Materials were then transported to the villages; from there it was the responsibility of villagers to carry them to construction sites.

The shelters after two years

After two years, nearly half of the shelters were still standing in their original position. Of those that had been removed, one was reassembled in the summer pastures. Shelters were commonly removed to make space for the 'permanent' house or to reuse the materials. The corrugated iron and the timber were the most commonly reused materials.

Materials	Quantity
Polypropylene sand bags	350
Wire 14g/PP strips 20 x 6mm	¼ roll
Polypropylene string	6 rolls
Corrugated iron sheets 2.74m x 0.99m	16
Iron ridge sheets	6.7m
Nails	5kg

Salvaged timber was also used for the roofing frame.

Toolkits were shared between five families and contained: an adze (woodworking axe) with handle, a cold chisel, a 1.3 m crowbar, a hacksaw with 20 blades, a 2kg hammer, a claw hammer, 10m of transparent hose, three needles, a pick with handle, pliers, a 400mm handsaw, a shovel, a 10m tape measure and an adjustable wrench.

Inside one of the transitional shelters

Photos: Albert Reichart

Building one of the transitional shelters

B.11 Pakistan - 2005 - Earthquake

Case Study: Shelter materials distribution

Project type:
Transitional shelters
Distribution of household non-food items, corrugated iron and toolkits

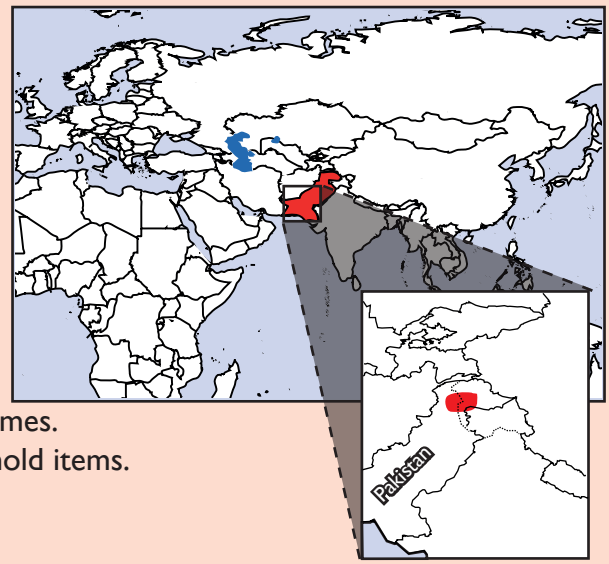
Disaster:
South Asia earthquake, 2005

No. of houses damaged:
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 received quilts and household items.

Occupancy rate on handover:
Unknown

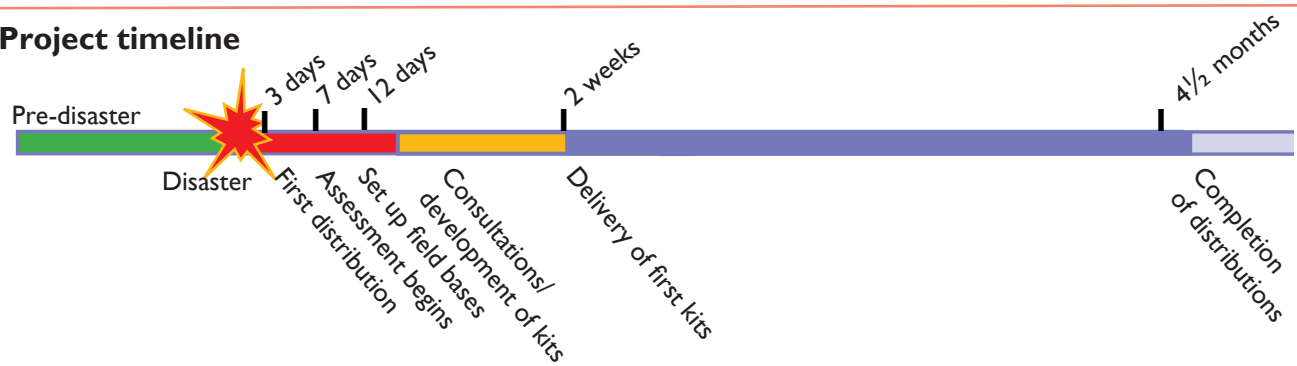
Shelter size
6m x 4m of plastic sheeting and 22m^2 of corrugated iron
Approximately 18m^2 covered space per family



Summary

An international NGO ran a distribution programme to over 15,000 families in areas with difficult access. Field teams validated each beneficiary family. Once supply lines were established, a large-scale programme was set up to deliver 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 procurement and staffing challenges, consultations on the material items were limited. This led to varying levels of satisfaction between project areas.

Project timeline



Strengths and weaknesses

✓ An international organisation was able to set up a distribution programme that helped to support over 15,000 families.

✓ Beneficiaries were selected on a house by house basis.

✓ Materials delivered (including tools and fixings) were selected so that they could only serve to make buildings stronger.

× Due to challenges in finding staff, there was no seismic-resistant construction training component to the programme and the programme was run exclusively as a logistics exercise.

× Due to the scale of procurement and time constraints, toolkits were developed through a limited consultation process that did not take into account different individual, local and regional needs.

× There were many issues with the quality of the materials procured, leading to the question of whether one good quality hammer for five families was better that five bad quality hammers.

× Access was limited, and families were responsible for transporting materials home from distribution points without assistance.

× A 'one size fits all' approach was taken. This did not take into account differences in needs between individuals or regions.

Selection of beneficiaries

Within one week of the earthquake, major field offices were set up in Bagh and Muzaffarabad, the two operational hubs for relief operations in Pakistani-controlled Kashmir. The programmes were in rural areas, selected on the basis of the level of damage and coverage by other organisations.

The initial lists of people who should qualify for support were provided by community leaders. A member of the field team then visited each house, often climbing a long way to reach it. People were checked against a number of criteria, including the level of damage to their house. Each qualifying homeowner then received a distribution card, which could be exchanged for items at an agreed distribution point at an agreed time.

The only location where there was significant dissatisfaction with the assessment process was where the distribution took place through a local partner NGO, where prominent local individuals may have biased the selection.

Technical solutions

Given the logistics and staffing constraints and the scale of the need, a programme was developed that was based exclusively on distribution directly to affected families. Tents and blankets were distributed in the first weeks. However, a revised plan to distribute blankets, roofing materials and toolkits was rapidly agreed upon. People were expected to salvage their own timber to construct a frame and a roof.

Corrugated iron and plastic sheeting were distributed for use as roofing materials. The advantage of corrugated iron and plastic is that they are relatively lightweight. Even a poorly built shelter is unlikely to kill people in the event of further aftershocks and building collapse.

Toolkits containing basic carpentry and earthmoving tools, as well as nails and metal strapping for use as fixings, were developed through a limited but rapid community consultation. The time pressure was such that orders for large numbers of kits could be rapidly placed, leading to cost and logistics savings. The idea of delivering

The shelter programme distributed directly to affected families

materials in standardised kits was to reduce difficulties and tensions at the distribution points, but it led to distributions being less targeted to individual needs.

At a later stage, cooksets, stoves and coal were procured and distributed, but not in the same quantities as the toolkits and the roofing materials.

An evaluation indicated that many people did not find the toolkits very useful. In Muzaffarabad, where the toolkits were initially specified through a rapid consultation process, satisfaction was higher than in Bagh, where consultation had been very limited. It is not known whether the distribution of large quantities of fixings and metal strapping served to make buildings more seismically resistant.

Reasons for dissatisfaction with the toolkits

These included:

- limited consultation in the design of the toolkits due to time pressures;
- the varying skills and capacities of affected populations to use the tools;
- the variable security surrounding Bagh;
- lack of support to help people use their tools to rebuild; and
- the inconsistent quality of tools.

Implementation

Although distribution points were selected with the consent of community representatives and communities were notified well in advance, the terrain and earthquake damage to roads meant that many people incurred costs in getting to the distribution points and transporting materials home. This was by far the largest cause of dissatisfaction with the distribution process.

Corrugated iron became a much sought-after commodity in distributions. A combination of the cost of the iron and the very low incomes of many affected families meant that a distribution of corrugated iron was equivalent to months' or even years' worth of disposable income to families. The value was such that many people did not use it to meet immediate shelter needs as intended. Instead they stored it for use in reconstruction or sold it for cash.

The non-availability of land was due to areas being prone to landslides and the remaining land being owned or used for farming. Due to the scale of the programme and challenges in identifying staff, it was not possible to provide support in negotiating access to land or to support construction.

It was noted that affected people tended to act more as individuals and families than as 'communities' following the earthquake. Individual families limited their responsibilities to building their own shelters, rather than creating and supporting initiatives. The challenges of the earthquake, the environment and the weather made people prioritise to ensure that their own needs were met.

Material	No.
Corrugated iron sheets 8'x3'	10
Quilts	4
Blankets	2
Toolkit: spade, hammer, wood saw, iron saw, 20m rope, pliers, hoe, 8kg nails (including roofing nails)	1
Plastic sheet 6m x 4m	1
Stove with exhaust pipes	1
Jerry can 20l	1
Jackets – 1 large, 1 medium, 1 small	1
Plastic shoes – 1 large, 1 medium, 1 small	1
Cookset: 3 pots, 6 large plates, 6 small plates, 6 spoons, 1 knife, 2 mugs	1

B.12 Sri Lanka - 2007 - Conflict returns

Case study: Core shelter

Project type:
Transitional shelter construction

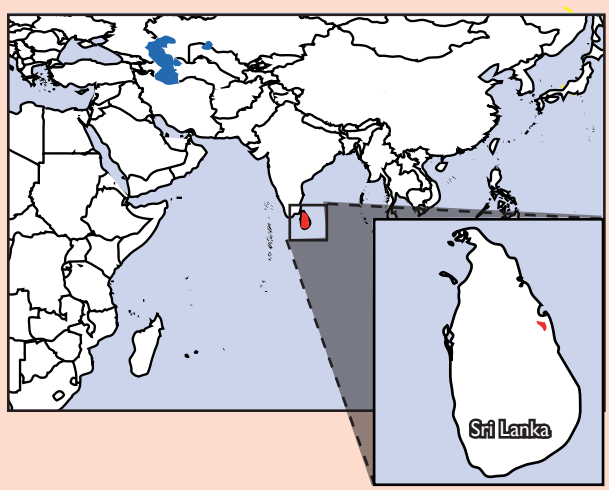
Disaster:
Civil conflict in Sri Lanka

No. of houses damaged/ people displaced:
520,000 families displaced by the end of 2006;
238 houses in Karukamunai, the community where the NGO was working

Project target population:
Over 300,000 people displaced in 2006;
213 of these families targeted

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

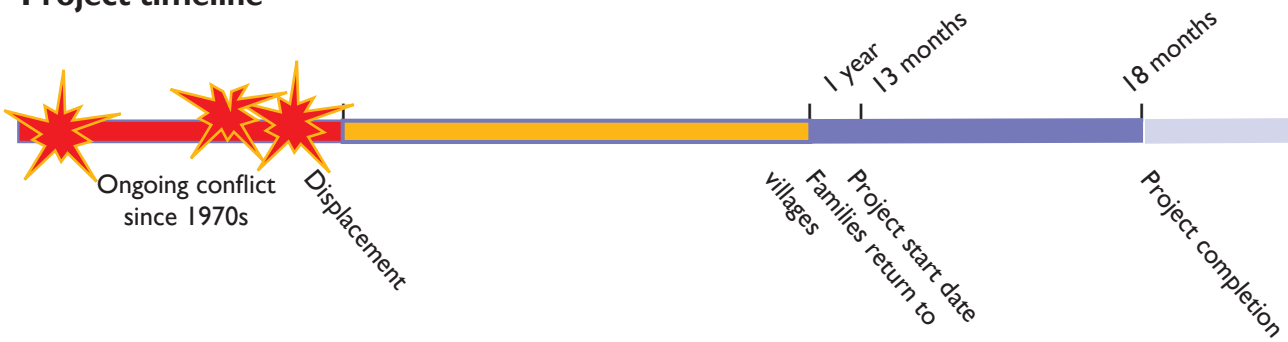
Shelter size
18.6 m^2



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 and for the same initial costs as less durable 'semi-permanent' shelters. Expansion and adaptation of the shelters happened very early on among the majority of beneficiary households.

Project timeline



Strengths and weaknesses

✓ Families were able to quickly adapt the core shelters to their own needs. Much emphasis was placed on beneficiaries' own capacities.

✓ 'Sweat equity' provided income for some community members. Income from this was used to buy materials for shelter improvements.

✓ Use of community networks reduced the challenges involved in monitoring and supporting the project from a distance.

- Smaller-sized core shelters can be appropriate for some communities.

- Clearly-defined written 'contracts' between the NGO and each beneficiary household reduced the potential for mismanagement of expectations.

Core shelter under construction

Completed core shelter

Before the project

The district of Karukamunai, in north-east Sri Lanka, had been on the front line of the fighting between the Sri Lankan government and the Liberation Tigers of Tamil Elam rebels for many years. Families from the area had been displaced to camps near the large port town of Batticaloa during the heightening of hostilities in 2006.

In July 2007 many displaced families returned to their villages to find many of their homes destroyed or in disrepair. The majority of the previous housing stock had been constructed from mud-brick and palm-thatch roofs, and had often fallen apart due to the weather, lack of maintenance or encroachment by elephants.

Previous to this project, the government had insisted upon a 500 ft^2 foundation. In many cases the beneficiaries did not have the personal resources to complete the larger shelter immediately, or had expected other NGOs or the government to provide them with the shelter extension.

The district was very isolated, which made direct monitoring of the project difficult. It also forced the NGO to adopt a relatively hands-off approach, and greater responsibility for construction quality and completion was allocated to the beneficiaries themselves. At the same time, the NGO was under pressure to show results in a short period of time. This was partly expressed as the wish of the local government, but also in recognition of the short time before the next rainy season.

The community had a large capacity for self-build work and a knowledge of carpentry and masonry, and was also eager to finish the work quickly.

Selection of beneficiaries

Effective coordination among the shelter actors resulted in the allocation of the nine different Grama Niladarai administrative areas to different specific agencies. Within the one administrative area assigned to the NGO, the local authorities supplied a list of names of 238 eligible households. Of these, 213 were able to give the NGO staff the necessary confirmation of loss of housing and tenure of the land.

Land rights / ownership

Each beneficiary household had to show the location and remains of their destroyed house as proof of tenure. This was then confirmed by the local authorities, although time constraints did not permit the NGO to make further investigation. Confirmation was hindered by the large number of families who had lost documents during the displacement.

Technical solutions

Analysis showed that there would be little difference in costs between a semi-permanent shelter of the style used during earlier tsunami responses, and a core shelter made with permanent materials. After research and discussions in the communities, the NGO also came to the conclusion that a smaller (18.6m^2) core shelter would be acceptable to the communities, as long as there were obvious demonstrations of the design's adaptability and expandability. In group meetings with the communities the core shelter version was chosen.

The core shelter has a fully enclosed space, as well as a veranda area that can also be enclosed. Technical drawings were provided to demonstrate basic possible variations to expand it in different directions (front, side). Specific features were incorporated to give the walls greater durability (stabilisation and curing of the building blocks) and greater resistance to cyclones and heavy rains (steel bar reinforcement of wall pillars, roof trusses, binding of trusses to walls, use of J-hooks for the roofing sheets, overhang of roof to protect walls from rain, adequate foundations, raised flooring). Where possible, the raised floors were built using recovered materials from the destroyed houses.

The beneficiaries used a variety of materials when building extensions, ranging from building blocks to plastic sheeting and palm thatch. It was estimated that the construction of each shelter would take about three weeks, including the one week needed for curing the building blocks.

'It's nearly the same size as our previous house, but with a good door and window'.

Implementation

A local school was designated as a central storage area for all the materials being brought in by the NGO, and a storekeeper was employed from the local community. Each family was required to sign a contract with the NGO, which clearly stated the responsibilities of the NGO and those of the beneficiaries.

The NGOs delivered the materials (apart from the locally sourced river sand) and gave small grants, provided at different stages of completion, to cover labour costs. The beneficiaries were responsible for taking the materials from the central distribution site, for

More than 80% of the families used personal resources or their own time and effort to upgrade their core shelters.

organising the construction and for quality assurance, both of the shelters and of any subsequent additions. The NGO also distributed instructions on proper methods of block-making and technical drawings of model designs for the shelters.

The NGO loaned work tools for each community to share, with the intention that each family would take their turn with them and then pass them on, or would sign them out and give them to hired masons. In practice the method of sharing the tools devised by the community members was more informal, but did not produce complaints.

During initial community discussions, the NGO explained that they would consider giving extra support to those members of the communities who fell into categories of vulnerability, but that this extra help might be limited to providing materials for the floor filling and extra funding for the work of floor compaction (all other construction needs were already taken care of through the provision of the materials and the grants for labour). In the end, few members of the community came forward with such requests.

As a complementary programme, the NGO provided repairs of pre-existing toilets and also identified a partner for the provision of new toilets where needed.

Logistics and materials

Because of the isolation of the location, the ongoing conflict, and the lack of local suppliers, the NGO provided all materials, apart from locally sourced sand. All other materials were procured in Trincomalee, the nearest large port. The majority of the timber was coconut timber taken from sustainably managed sources. The beneficiaries were given small grants to pay for the transportation of materials from the central distribution site.

A durable upgrade of a core shelter

After the project

More than 80% of the families used personal resources or sweat equity to start the process of improving their shelters. Some members of the community were also able to gain livelihood opportunities by doing masonry or construction work for other members of the community. The isolation of the location and the damage to the economy caused by the conflict meant that there was little other competition for employment among members of the community.

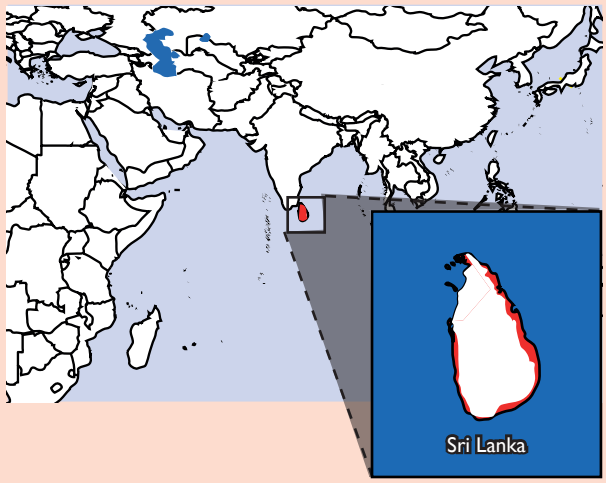
Material	Quantity
Cement 50 kg bag	26
River sand (tractor load)	4
20mm aggregate (metal)	0.3m^3
Gravel (existing debris could be used)	1.3m^3
10mm diameter steel reinforcement	2
6mm diameter mild steel reinforcement	3.7m
Binding wire	0.2kg
Wall plate 50mm x 100mm	15m
Ridge plate 50mm x 100mm	7.5m
Tie beam 75mm x 125mm	3.7m
Prop 75mm x 125mm	1m
Rafter 50mm x 100mm	44m
Reaper 25mm x 50mm	60m
Soligram	10 litres
28-gauge corrugated iron sheet, 2.4m long	20 sheets
Tar sheet 0.9m wide	3.4m
Ridge tiles	20
L-hook with nut & washer, 75mm	6kg.
Nails 100mm	2kg
Nails 50mm	2kg
10 mm diameter bolt and nut, 150mm	2
10 mm diameter bolt and nut, 100mm long	6
Door 0.9m x 1.8m with frame, including ironmongery and fixing	1
Window 0.9m x 1m with frame, including ironmongery and fixing	1

B.13 Sri Lanka - 2004 - Tsunami

Overview of the tsunami response

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 focused on the construction of transitional shelters to bridge the gap until permanent shelters could be built. This case study is of one 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 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 gave 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 having a coastal buffer zone. Construction was excluded from within 100m of the high-tide mark in the south and west and within 200m in other areas. This created major challenges in finding land to rebuild on, leading many families to live far from their livelihoods and forcing the creation of many camps.

Coordination

Coordination within the shelter sector was generally good, with full participation from the government at both the 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.

Photo: Joseph Ashmore

One of many transitional shelter designs adapted by its occupants

Different 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 the east. This led to tensions and difficulties for many ongoing development projects.

Emergency shelter needs

Immediately following the tsunami many families found temporary shelter in public buildings, such as temples, or with host families. In the weeks that followed, many were able to make some basic repairs to their houses, while 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 six- to nine-month emergency and transitional periods, and there were often gaps in the handover to other organisations that could support permanent reconstruction.

Despite the incentives of government grants, many families rebuilt houses that 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 construction quality.

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

There was no construction allowed within 200m of the high-tide mark in some areas and within 100m in other areas.

In some cases, small groups of transitional shelters were built on small plots of land that were negotiated on a temporary basis.

New settlements or camps had to be built for many of the displaced. Many of the allocated sites were prone to flooding and away from livelihoods.

Photos: Jo Da Silva and others.

The shelter strategy allowed for many different shelter designs. Over 70,000 transitional shelters were built.

B.14 Sri Lanka - 2004 - Tsunami

Case study: Transitional shelter construction

Project type:
Transitional shelter construction

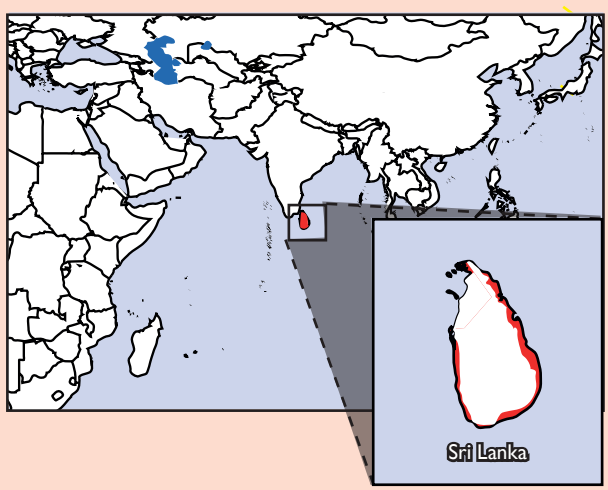
Disaster:
Indian Ocean tsunami, 26 December 2004

No. of houses damaged:
100,000 nationally; 5,500 in the area where the NGO was working

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

Occupancy rate on handover:
Estimated at 90%

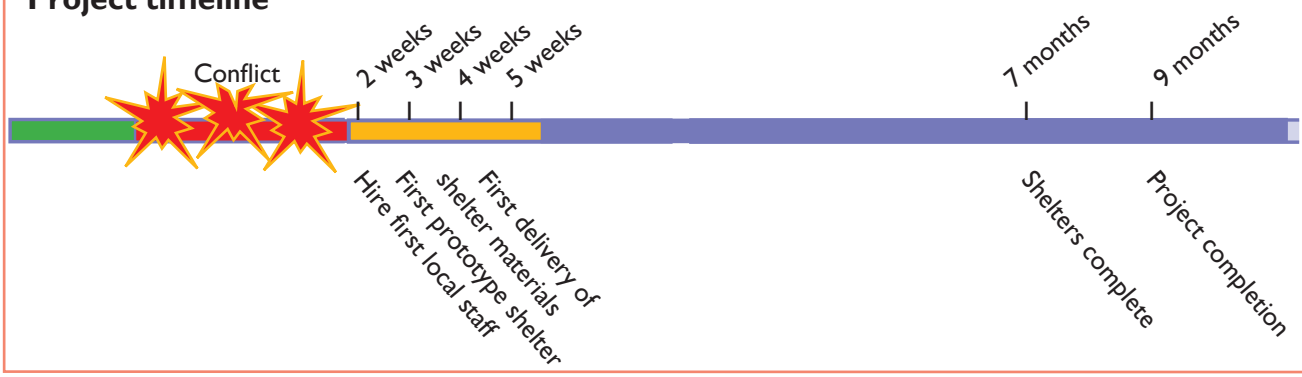
Shelter size
18.6m^2 (200 ft^2), later upgraded to approximately 20.5m^2 with enclosable veranda space



Summary

Using easy-to-construct and easy-to-carry metal frame shelters adapted from previous Sri Lanka programmes, the NGO was able to support affected families in 27 different villages along the coastline. The project avoided the creation of large camps, focusing instead on helping people to build on customary plots of land that belonged to them or were negotiated from land owners.

Project timeline



Strengths and weaknesses

✓ A high level of choice was given to beneficiaries in terms of location, adaptability of design, transferability and potential for reuse.

✓ Apprenticeship training in basic carpentry and electrician skills was provided for local tsunami-affected youth.

✓ Support was given to families to build on customary plots of land and not to build new camps.

✓ The project was augmented by rainwater harvesters and community-based micro-irrigation projects.

- Beneficiary labour was used, with trained support for vulnerable beneficiaries.

× The project perpetuated unplanned coastal settlements, preventing upgrading of sanitation or better environmental husbandry.

× There was no clear link to permanent reconstruction.

Before the tsunami

Many families had built houses on customary plots in ribbon settlements along the coast road. This was a response to the economic development of the region over the previous decade and was spurred on by government-backed housing programmes. However, consideration was not given to the consequences of cyclone and flooding risks to individual houses or to the consequences of drying out coastal marshes and naturally flooding areas. The haphazard layout of the housing also limited the possibility of community-wide or municipal sanitation and drainage solutions in many cases.

In-country experiences

This project was implemented by an NGO that had previously worked on transitional shelter programmes for those displaced by the conflict in the north of Sri Lanka. Much of the shelter design and the methods for interacting with the communities and the local government were adapted from this previous programme.

Minor changes were made in the design of the shelter from the previous project, giving the shelters greater height.

In the previous programme in the north, many of the beneficiaries were living in IDP camps and had limited access to livelihoods. This meant that they could spend more time on shelter construction, and were more inclined to work on each other's shelters. In contrast, the tsunami-affected populations in the south had a culture of working independently, with more diverse livelihoods. This led to the project running more slowly than anticipated.

Selection of beneficiaries

The NGO approached local village officers and coordinated with them to receive a full list of those in need of shelter. This was then cross-checked by door-to-door visits conducted by NGO staff. The cross-checking process was also used to identify vulnerable households eligible for support from NGO technical teams in the construction of their shelter. All the beneficiaries from a community were asked to nominate a small committee to store the shelter materials and help with their distribution.

Shelters were arranged in small groups on plots of land, often negotiated with the help of the NGO.

Land rights / ownership

Many of the families living beyond the 100m coastal buffer zone had lived on traditional plots, although many did not have clear ownership titles. Almost all of these families chose to remain on their traditional plots of land.

For those who had lived within the buffer zone, the NGO worked with the communities to find host families on whose plots shelters could be built. In three cases, small planned settlements of 15-30 families were constructed, as close to sea-based livelihoods as possible.

Local government officials were usually willing to allow families to construct shelters on their previous spots. This deferred ownership issues until the time when permanent reconstruction would start.

Technical solutions

Shelters needed to be easy to construct so that beneficiary participation could be maximised. They also needed to be movable, to help people as they moved out from living with host families or were disassembled to make way for permanent reconstruction.

The basic shelters were made from box-bar metal frames, which could be rapidly assembled into the basic skeleton of the shelter so that even those with little physical strength or prior construction knowledge could assemble them.

The metal frames also meant that the shelters could be relocated and reused if necessary, unlike shelters made from wood. The roofs were made from galvanised metal (a material specifically insisted upon by the beneficiaries to reflect their perceived social status), with open eaves under the roofs to provide for ventilation.

The beneficiaries were asked to provide the rubble for the raised foundation and the sand for the cement mix. A half-wall of concrete blocks was built along the edge of the foundation. Each household was given a small grant to do the masonry or to find local craftsmen. The sides of the shelters were then initially covered with plastic sheeting, which was reinforced by plywood. The work was done by 'shelter crews' of local tsunami-affected youth from the communities involved.

A detached veranda was later added as an upgrade. This could be positioned on any side of the basic shelter and could be used either as additional living space or as a kitchen area. Later, guttering and rainwater harvesters, as well as roofing insulation and basic electrical wiring, were added.

As part of a parallel programme, families without latrines were provided with materials and technical advice for latrine construction.

Implementation

Shelter materials were delivered upon completion of each stage of the building. The frame and roofing were delivered first, then the concrete blocks for the half-wall, followed by the siding materials. However, the timing of the delivery of second- and third-stage materials was complicated by families building at different speeds.

The frames and roofing sheets were prepared in the NGO's warehouse, while the plastic sheeting was cut to measure in a small workshop set up by tsunami-affected families in one community.

Site with poor drainage. Not all available shelter sites were ideal.

Shelters built with tanks for rainwater harvesting

In each community, the first one or two shelters were constructed by NGO staff for the most vulnerable people, as a way of demonstrating the assembly method to the rest of the community.

The longer times taken by many families to complete their shelters meant that the amount of time needed for support and supervision by the NGO staff also increased. This in turn meant that the NGO was not able to extend its support into more communities and caused the initial forecasts for completed units to be reduced twice across the programme.

Logistics and materials

There was an effort to ensure that the procurement process would support the national economy, while trying to avoid creating scarcity or putting inflationary pressures on the materials needed for permanent reconstruction. Most materials were supplied from the south and west of Sri Lanka, with the exception of the roofing sheets and the plastic sheeting, which both came from abroad.

There were concerns that the concrete blocks would conflict with demand due to permanent reconstruction. Many of the concrete blocks supplied for the transitional shelters were not of sufficient quality for hazard-proof permanent housing.

The supply of sand (for mortar and for constructing the foundations) also posed difficulties. Initially the NGO had encouraged the communities to take sand from the beaches, but this was counter to government bans and also had a potentially negative impact on the environment. In some cases, communities were given small grants to buy sand from local suppliers.

Materials list

Material	Quantity
Steel column - 40mm x 40mm x 1.85m	8
Steel bracing - 20 mm x 20 mm x 2.13m box bar	4
Steel purlin - 20mm x 20mm x 5.7m box bar	4
Steel trusses - 25mm x 25mm box bar	4
Steel rear side bar - 20 mm x 20mm x 3.48m box bar	3
Steel side bar - 20mm x 20mm x 5.18m box bar	2
Steel front side bar - 20mm x 20mm x 230mm	1
Pop rivet - 3mm x 16mm	
G.I. bolt & nut - 75mm x 6mm and 64mm x 6mm	32
Door (fully completed)	1
Door stopper - 25mm x 25mm x 45mm	1
Hinges -100mm x 75mm	2
Cement (50Kg)	1
Roofing Sheet - 190mm	8
Ridge sheet - 470mm x 45mm	1
Hook bolt nut	32
Concrete block - 380mm x 180mm x 100mm	210
Concrete feet for columns	8
Sand (provided by beneficiaries)	

After June 2005, an upgrade veranda extension was made using the following materials:

Material	Quantity
Pillar plate - 100mm x 50mm x 250mm	4
Rafters - 50mm x 50mm x 200mm	6
Tie bars - 50mm x 50mm x 125mm	8
Wire nails 50mm & 75mm	1.5kg
Roof sheet	4
Umbrella nails	0.2kg
G.I. ridge sheet - 0.9m x 2.4m	1

In July and August 2005, basic electrical wiring (one plug socket and one light socket) and roofing insulation were added.

The construction of the shelters was not a difficult process.

Photos: Jim Kennedy

Section C
Latin America and Caribbean

C.1 Honduras - 1998 - Hurricane Mitch

Case study: Transitional shelter

Project type:
Transitional shelter construction

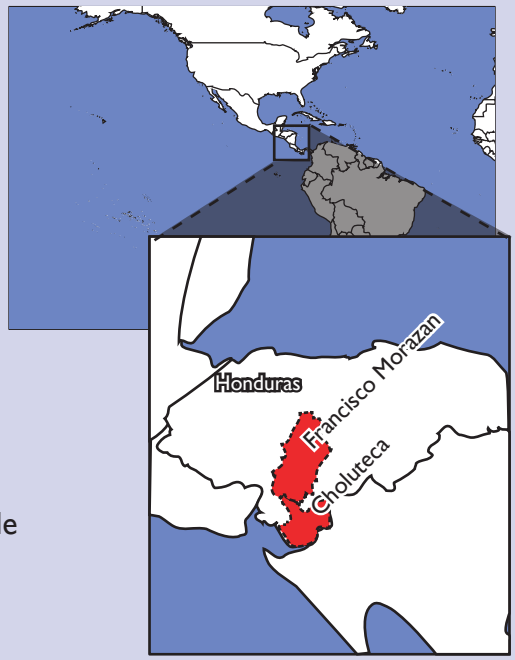
Disaster:
Hurricane Mitch, 1998

No. of houses damaged:
33,000 houses destroyed and 55,000 damaged across Honduras

Project target population:
3,000 families (15,000 beneficiaries)

Occupancy rate on handover:
Very high

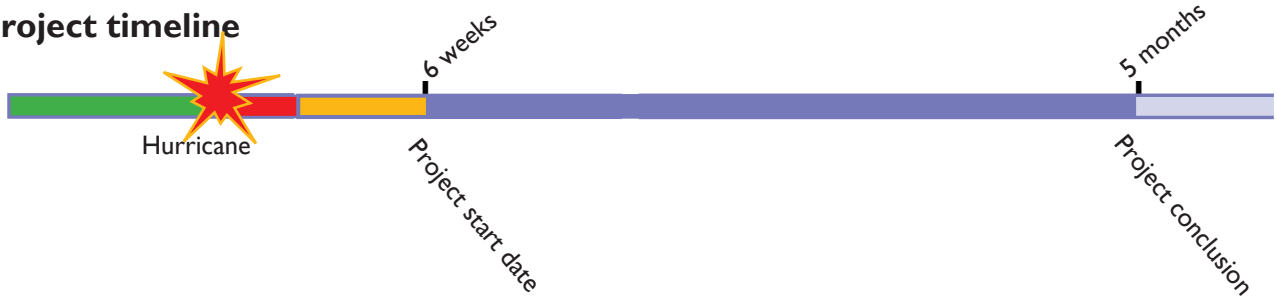
Shelter size
11.1m²
The shelter was targeted to a family of four to five people (two adults and up to three children).
Larger families were offered more than one shelter.



Summary

The programme provided materials and technical assistance for construction of a 3.05m x 3.65m wood-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 rebuilt their houses with more durable materials. The 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.

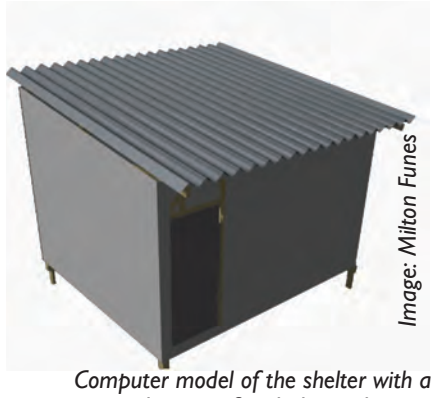
Project timeline



Strengths and weaknesses

✓ The project involved quick implementation, immediate community involvement, low costs, use of local material and labour, and was replicable.
- The shelter was rapidly accepted as a model by local authorities and beneficiaries.
- Logistics were sometimes tough in highly concentrated areas.
- There was confusion with the beneficiary lists given by local authorities.
× The provision of basic services such as water and electricity were slow and somehow chaotic.
× In highly concentrated areas sanitation was sometimes an issue if it was not addressed holistically.

Computer model of the timber frame of the shelter



Computer model of the shelter with a corrugated iron roof and plastic sheeting walls

The disaster

From 29 October to 3 November 1998, Hurricane Mitch dropped historic amounts of rainfall on Honduras, with unofficial reports of up to 1900mm of rain. Deaths due to catastrophic flooding made it the second-deadliest Atlantic hurricane in history: nearly 11,000 people were killed and over 8,000 were missing by the end of 1998.

The flooding caused extreme damage, estimated at over US$ 5 billion in 1998 (equivalent to US$ 6.5 billion in 2008 terms). Honduras was the worst-affected country, although Nicaragua, Guatemala and El Salvador were also severely effected.

Before the disaster

Before the hurricane, the organisation had a programme to assist the region's population to prepare for and mitigate disastrous events. This working relationship with communities in the area was very useful in helping the organisation work with the authorities to ensure that the beneficiary selection process was rapid, accurate and transparent.

Beneficiary selection

The transitional shelter programme first targeted the most vulnerable families in communities under the Departments of Francisco Morazan and Choluteca. Disabled and elderly beneficiaries without resources were assisted first, followed by those without the financial resources to provide adequate shelter for themselves (the poor).

While 'the poor' are often difficult to define, the following types of families were prioritised: families that remained without adequate shelter two weeks after the disaster, and/or families identified by the municipality leadership as a poor family. This category was confirmed by a local social organisation or other reliable source.

Selected communities were asked to provide lists of the vulnerable families, according to standard local criteria for vulnerability.

Database

During the project, the organisation maintained an electronic database of approved beneficiaries, details of house/shelter location, family members, levels of vulnerability (age and disabilities), and status of shelter construction and beneficiary participation. This database was linked to systems for tracking the delivery of materials and shelter construction progress.

Land and ownership

For those families who chose to stay near their destroyed home and had an area that was safe, flat and dry, the organisation helped them to erect a transitional shelter on their own land. Families were required to clear a spot in the ruins of their former home.

In some other cases where safe land was not available near the original site, the organisation coordinated with local authorities to define temporary relocation sites.

Technical solutions

The shelter model adopted was a timber-framed structure.

Implementation

Materials for one shelter were delivered to each beneficiary family. Many families, especially the most vulnerable, lacked the skills to build sound frames for the shelter without direction, although they could often provide construction labour.

For the families who needed it, instruction and supervision on construction was provided. In cases where the family had limited capacity to assist with construction labour, the programme provided supplemental construction labour. This support ensured that the shelter was erected quickly and correctly.

For the most elderly and disabled, all or most of the construction labour for the shelter was provided. Where possible, timber from the destroyed house was reused in the temporary shelter.

'Though it is not a big space, it feels like home for me, my husband and children'. - Beneficiary in Las Brisas, Tegucigalpa

Marking out the site for a shelter

Prefabricating walls

Shelter assembly using prefabricated walls

Completing the frame

Logistics

Beneficiaries signed for the material when it was delivered and were responsible for the material's security from that point onward. This requirement was made clear to each family at the onset of their involvement in the programme.

A senior staff member based in the country office was responsible for the procurement and transport of the materials required for the programme. Ensuring that all materials were procured and delivered according to schedule was challenging.

Covering the frame

Materials list

In addition to the materials listed below, approximately 36m^2 of woven ribbon of international specification plastic sheet was provided by the donor organisation.

Materials	Quantity
Timber 50mm x 100mm x 3m	8
Timber 50mm x 100mm x 3.6m	4
Timber 50mm x 100mm x 4.3m	3
Timber 50mm x 100mm x 1.8m	1
Timber 50mm x 50mm x 2.4m	6
Timber 50mm x 50mm x 4.3m	5
Timber 25mm x 74mm x 2.4m	
Galvanized roof sheet 28 SWG - 0.8m x 2.7m	6
Galvanized roof sheet. 28 SWG – 0.8m x 1.8m	6
Nails 100mm	1.5kg
Nails 75mm	1.5kg
Nails 50mm	1.5kg
Roofing Nails 50mm	288
Staples 12mm	300
Diesel (to protect wood from termites)	2l
Cement (42.5 kg bag)	2.5 bags
Gravel	0.18m^3
Sand	0.15m^3
Plywood door / standard size	1
Plywood sheet (5mm x 1.2m x 2.2m) for corner reinforcements	1

List of tools needed to build 50 - 75 transitional shelters:

Materials	Quantity
Hole digger	10
Manual saw	10
Hammer	20
Tin snips (tin scissors)	10
Plumb	10
Tape measure	10
Level	10
Staple gun	10
Table saw	1
Portable saw	5
Diamond saw blades	5

Photo: Milton Funes

Covering the roof with corrugated iron

'Through this simple and quickly installed structure we have been able to provide an intimate family space for the victims of the hurricane'. - Jose Aleman, carpenter working on the project

Photo: Milton Funes

Photo: Milton Funes

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.

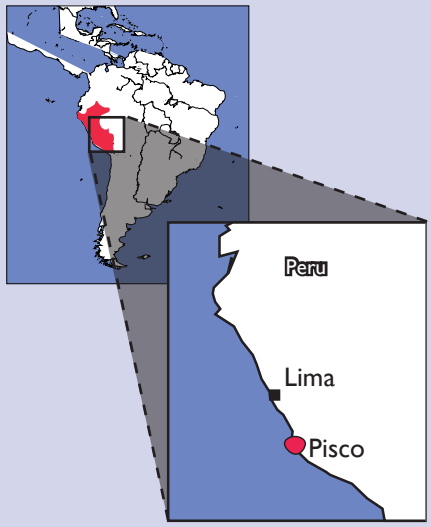
C.2 Peru - 2007- Earthquake

Overview of the response

Summary

On 15 August 2007 there were two major earthquakes separated by nearly one minute. This was followed by a three-metre tsunami that caused some damage along the coastline. The earthquake killed nearly 600 people and injured more than 1,800. Some 48,000 houses were destroyed and a further 45,000 were rendered uninhabitable. In total, 140,000 households were affected. The majority of the affected population lived in towns.

The three case studies included here are 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 had land.



Earthquake location

The area that was most affected is situated in a desert area with high temperature variations and little or no rainfall. In the more mountainous areas that were affected, cold is 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 people within the country itself.

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 programmes. Some programmes provided shelter materials for those without land that could be later transported as land became available.

The shelter responses included:

- distribution of blankets, plastic sheeting, cooksets and other shelter items;
- distribution of tents (one organisation purchased over 13,000 tents);
- support for the construction of standard shelters through cash for work, training and carpenters; and
- 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 (emergency, transition, reconstruction, termination), each with its own set-up and responsibilities. After eight months, the transition stage gave way to the reconstruction stage.

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

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

Rubble

By January 2008, only one quarter of the rubble (nearly 2.1 million cubic metres of the total 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.

Some people with no other options found short-term shelter immediately after the earthquake in tents and camps.

C.3 Peru - 2007 - Earthquake

Case study: Community mobilisation

Project type:

Community mobilisation
Flexible package of shelter construction materials
Self-build
Training manual distributed

Disaster:

Peru earthquake, 15 August 2007

No. of houses damaged:

Over 48,000 houses destroyed; 45,000 uninhabitable

Project target population:

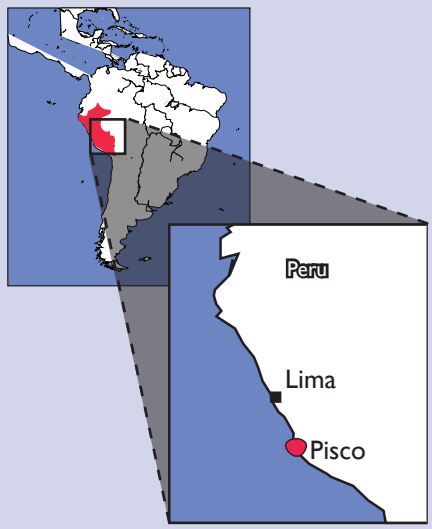
726 families
Just under 1% of the earthquake-affected population

Occupancy rate on handover:

Very high

Shelter size

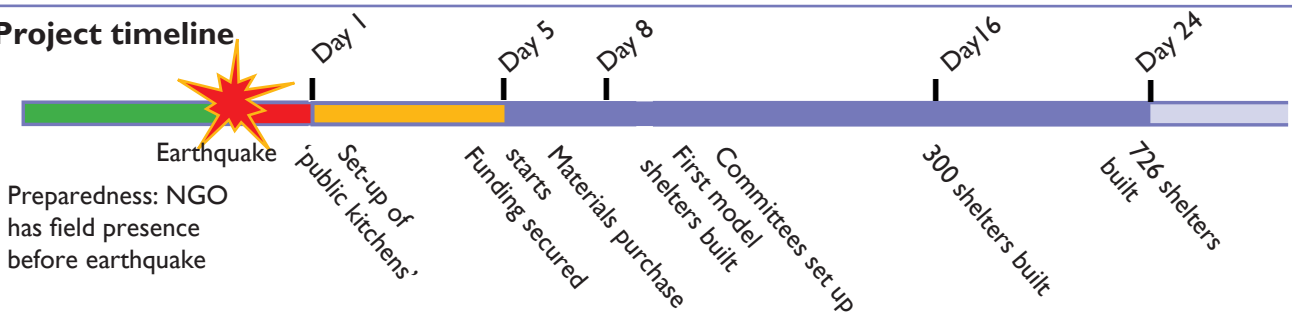
Materials distributed to create 9m² of covered space per family (to be supplemented by reclaimed materials)



Summary

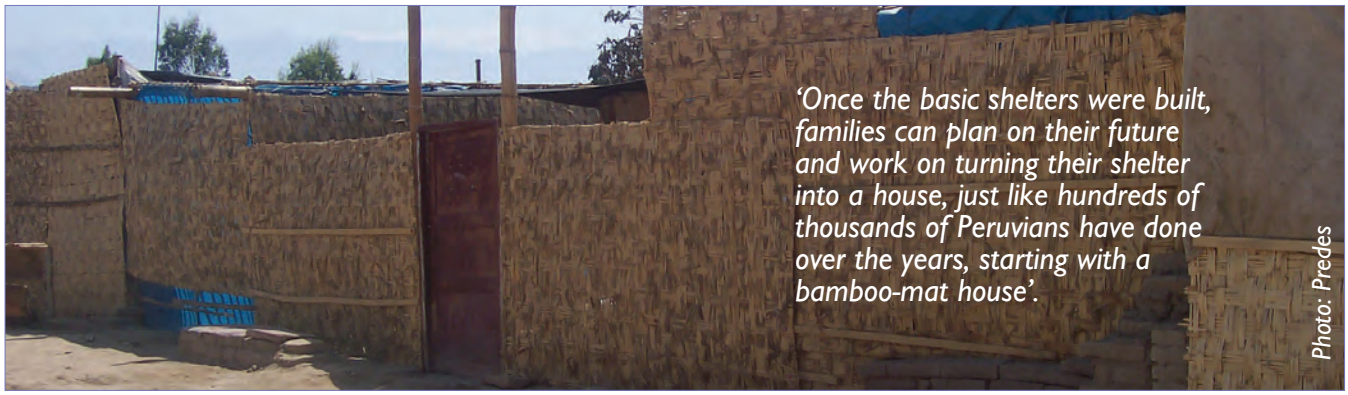
Following the earthquake of 15 August 2007 near Pisco (Peru) a local NGO set up 40 neighbourhood 'public kitchens'. These became a means to mobilise communities to distribute reusable construction materials for those most in need. Materials were selected that would have a longer lifetime than just the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

Project timeline



Strengths and weaknesses

✓ Very quick response appropriate to the context allowed people to soon return to income-generating activities.
✓ By creating more solid shelters, there was greater safety against burglars than would have been provided by lighter-weight shelters.
✓ The project sucessfully used materials that kept funds in the local economy.
✓ Using community structures that were not initially designed to manage a shelter project can lead to a fast and effective response (Note: Collective feeding centres may not be advisable in all circumstances.)
× Bulk local purchase of materials can lead to them becoming scare and cause price rises. The project stopped when mats became scarce in the market.
× Technical support provided to families was limited.



Selection of beneficiaries

A public kitchen was the basis of the project management. In the first stage it had 40 groups, each with a designated responsible person. Most of the groups were led by women. They became the centre of all project activities and organised frequent assemblies to discuss all aspects of the project and take decisions. The whole project was conducted in close coordination with the municipality.

Within days of the earthquake, the NGO was able to present the project ideas to the communities via the 'kitchen group'. Most opted into the project, while some decided to wait for better offers. Some of those who opted out were still waiting for support eight months later.

The beneficiaries were chosen based on a list of criteria, including: loss of shelter, family situation, vulnerability, poverty, residency in the area, and willingness to build the structure.

Every selection was to be approved by the assembly of the kitchen group, which was something like a 'block committee'.

Technical solutions

In the coastal regions of Peru there is a long tradition of constructing semi-permanent shelters using bamboo. In the past, immigrants to Lima and other cities have established themselves with simple structures, leading to the step-by-step construction of a formal house.

While the bamboo mats are not considered a formal construction material, the climate allows people to live in such structures. Many of the disaster-affected people had lived in structures made from bamboo at some time in their lives.

The project was based on community soup kitchens as a starting point for social mobilisation.

Materials distributed

Materials	Quantity
Bamboo mats 6 walls, 3 ceiling, 1 door	10 mats
Round poles (for columns) 3" diameter, 3m long	12 poles
Round poles for beams and roof joists 2.5" diameter, 3m long	11 poles
Timber for fixing the mats	7 beams
Reinforced plastic sheet	3m x 15m
Nails 2", 3" and 4"	2.2 kg
Wire	1 kg
Hinges	3 units
Lock	1 units

Implementation

Every family was responsible for the construction of their shelter. This allowed them to make adaptations dependent on available space, using materials that they had rescued.

The preselected beneficiaries were visited by the coordinators of the community kitchens together with somebody from the NGO or the municipality to check whether they complied with the following criteria:

- People had to be occupiers of a house on a plot of a land before the earthquake.
- Their plot had to be cleared of debris in order to place the shelter on it.
- One family member had received instructions on how to build and had participated in the construction of a model structure.

Beneficiaries were first given wooden poles and received the mats only when the structure was properly assembled. Materials were distributed by the block coordinators. Most families ended up digging a new latrine on their property.

Transporting the mats for a shelter to site

Logistics and materials

The wooden poles and woven bamboo mats were purchased from local production in the informal market. Plastic sheeting and hardware elements (nails, hinges, etc.) were centrally purchased.

The materials were shipped to San José, where the municipality provided the football stadium and another building as storage areas.

The trucks were unloaded by the potential beneficiaries. The implementing NGO organized and was responsible for the warehouse management.

The materials were given to the beneficiaries when they presented vouchers issued by the coordinators.

Building with these materials costs about 25% of what some other local organisations spent on their provisional shelters made of timber or low-grade galvanized sheeting. However, the local market had a limited capacity to deliver bamboo mats - an issue which, in the end, led to the ending of the project.

Family shelter built during the project

Making a basic shelter

C.4 Peru - 2007 - Earthquake

Case study: Self-build transitional shelters

Project type:
Transitional shelter construction
Self-build
Rubble removal

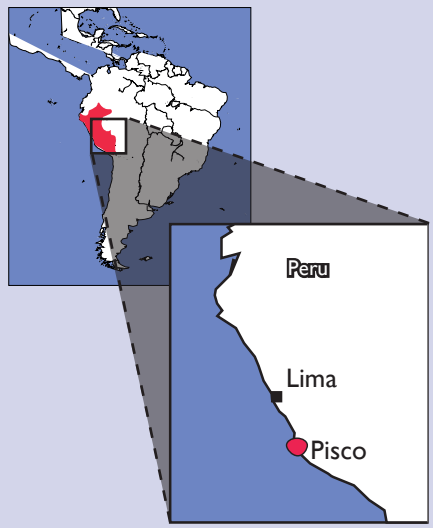
Disaster:
Peru earthquake, 15 August 2007

No. of houses damaged:
Over 48,000 houses destroyed; 45,000 uninhabitable

Project target population:
706 families (3500 people)
Just under 1% of the earthquake-affected population

Occupancy rate on handover:
Very high

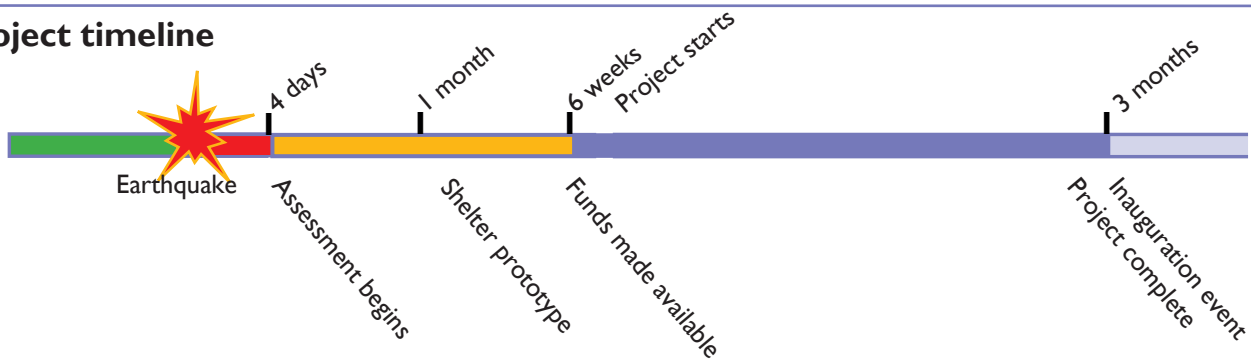
Shelter size
18m^2 covered space per family



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 on livelihoods for the affected population. In addition, it integrated water and sanitation interventions into the shelter programme.

Project timeline



Strengths and weaknesses

✓ The project paid special attention to the potential of shelter-related cash-for-work activities to speed up livelihoods recovery.

✓ Materials were procured through local suppliers, ensuring that cash remainied in the regional economy.

✓ Families were able to preserve materials for reconstruction and were given materials that they would be able to reuse.

✓ The project was integrated with sanitation and water supply projects.

- By directly implementing the project, significant amounts of time were required to manage the project and its logisitcs.

× It was difficult to procure the materials (woven mats and timber poles) locally. They had to be imported by suppliers from other parts of the country. The competition in the market from the demand and from organisations aiming to assist led to local price rises that affected the disaster-affected communities.

Rubble clearance

Fabricating doors

Selection of beneficiaries

Community leaders were initially requested to identify beneficiaries. These beneficiary lists were validated by the field assessment team, including interviews to validate the selection of each family. Lastly, a community meeting was held to establish who was to be included in the programme.

Most families had no formal land title, so shelters had to be easy to dismantle and remove if required.

Technical solutions

The shelter provided had an area of 18 m^2, enough to host a family of five. The shelter area was chosen based on Sphere indicators. The shelter itself consisted of a timber pole-framed structure with a soil-cement mix as flooring. Plastic sheeting covered the timber structure and woven reed mats were placed on top of the plastic sheeting to increase insulation and durability. Some shelters incorporated reclaimed materials, particularly mud blocks and doors. However, higher-value reclaimed materials, such as timber beams, were often stored by families to be used in the future construction of permanent housing.

The basic shelter design was arrived at by asking three carpenters in an affected community to build a sample shelter. Members of the community vetted the shelter design and a pilot project was then implemented. The shelter design was modified during the pilot to improve labour productivity and efficiency in the use of construction materials. It was expected that the shelter materials would be later reused in the construction of adobe houses (e.g. plastic sheeting used as a water barrier in the clay roof) or that the shelter as a whole would be reused as a kitchen.

Implementation

This shelter project was part of a programme that included shelter, cash for work, sanitation (where destroyed), small grants for businesses and transitional classrooms for schools. The cash-for-work project included debris removal (employing 100 women for two months) and payment for families who could not build for themselves. The sanitation project included the repair of destroyed latrines.

The project was implemented by a team consisting of one project manager and a team of ten final-year engineering student volunteers, each responsible for the shelters of around 65 families.

The project was conducted in close consultation with the local authorities. Before distribution of materials could take place, each family had to clear the debris from their damaged house into the street.

Making the concrete floor slab

The mayor had the responsibility of removing the debris from the streets in trucks. The programmes supported the authorities through cash for work for debris clearance.

Logistics and materials

As the project continued, the supply of timber poles and mats increasingly became a problem, as a result of large-scale purchasing by organisations and local purchasing by affected communities. This led to local price increases. All purchasing took place through local suppliers, who brought timber in from elsewhere in the country.

Timber poles proved easier to procure than sawn timber and the local population was accustomed to building with them.

Distributing cement

The materials were delivered to a central location; homeowners were responsible for transporting the materials for the shorter distances to their plots. The community was responsible for providing support to those members of the community unable to transport their materials.

Round poles, not sawn timber, were used

Materials for one shelter

Material	Quantity
Wooden round poles 10cm x 2.5m	7
Wooden round poles 4cm x 6m	15
Plastic sheeting (m^2)	60
Woven reed mats 3m x 2m	9
Portland I cement 42.5kg bag	2
Construction wire	5kg
Hinges 1.5"	3
Nails 1.5"	0.5kg
Skilled labour (hours)	2.6
Unskilled labour (hours)	4

Shelters under construction

C.5 Peru - 2007 - Earthquake

Case study: Prefabricated transitional shelters

Project type:
Transitional shelter construction
Shelter components prefabricated by contractors
Shelters assembled by homeowners

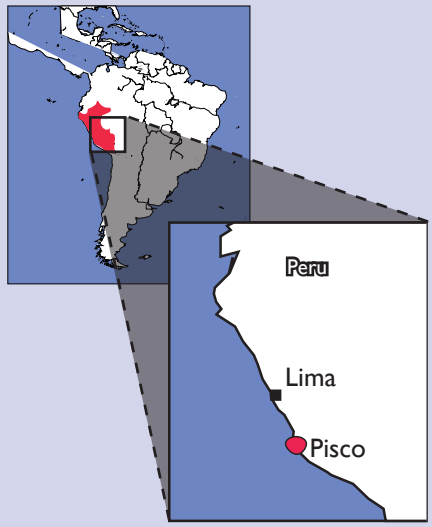
Disaster:
Peru earthquake, 15 August 2007

No. of houses damaged:
Over 48,000 houses destroyed; 45,000 uninhabitable

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

Occupancy rate on handover:
Very high

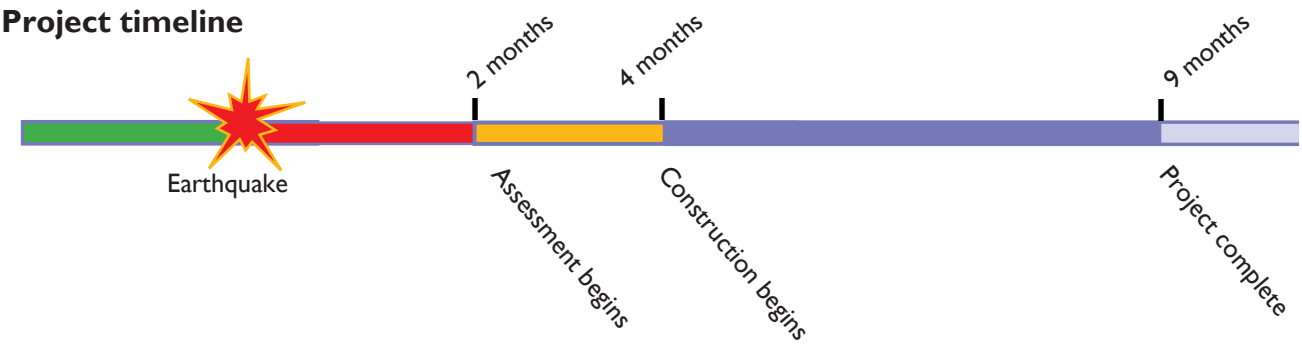
Shelter size
Materials distributed to create 18m^2 covered space per family.



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 cutting timber on site, the supplier was able to cut costs. Homeowners themselves assembled the shelters.

Project timeline



Strengths and weaknesses

✓ This project successfully used a contractor to build semi-permanent shelters for families, thereby passing on the challenges of procurement and logistics, as well as many of the risks of a construction project.

✓ Setting up local 'factories' to prefabricate components, reduced logistics and supply challenges, and the ensuing costs.

✓ The project was able to adapt to suggestions made for structural improvements to the shelter design, following an evaluation early on in the project.

- The construction approach required significant capacity on behalf of the contractor and constant monitoring by the humanitarian organisation. An ongoing dialogue between the humanitarian organisation and the contractor was essential.

- The project initially prepared all materials for a village before construction could begin. This was later adapted so that materials were prepared for only 20 houses at a time before construction began. This was more efficient and kept the community more motivated.

× This project took four months to begin.

Completed shelter built on the roof of a damaged house

Selection of beneficiaries

Communities were selected by analysing the gaps and noting that no other organisations were working in the areas. Families within communities were prioritised based on need and individual vulnerability.

Beneficiaries needed to prove ownership of land before qualifying for the project. The criteria were later relaxed so that those awaiting ownership certificates as the result of wills of deceased family members could qualify for the project without holding the formal land ownership certificates.

Families who were at risk and relocated from the 'no return zone' had to wait in temporary shelter on squatted allocated land for over nine months before they could be allocated land and qualify for a shelter.

Technical solutions

The shelter design was a rectangular, single-storey, 18m^2 (3m x 6m), wood-framed, shed-roofed building. The side covering was vertical, tongue-and-groove wood. Each panel was approximately 1cm thick and approximately 10cm wide. The shelter had one door and a large window on one long wall (at the front). The roof was a shed style made with lightweight, corrugated cement panels approximately 1m wide and about ½cm thick. The roof panels were long enough to run the full width of the roof. The flooring used pre-existing concrete slabs.

Each house took approximately eight hours to construct once the prefabricated materials were transported to the site. The idea was that all materials could be later reused.

All tools needed by the homeowner to build his/her shelter were supplied by the contractor and were left with the homeowner at the conclusion of the programme as a home maintenance tool kit.

Implementation

The initial contract was for 500 shelters. Costs rose 25% for subsequent shelters, due to local cost escalations.

The contractor set up a materials manufacturing 'factory' in each project area. At this site, the contractor's employees (using some local labour) cut, planed and finished the wall frame units. Only the contractor's employees used power tools.

Families were responsible for rubble removal, site cleaning and marking out the shelter location.

The raw materials were prepared in workshops set up in the communities where shelters were to be built.


Photo: LeGrand Malany

Completed shelter built on the roof of a damaged house

If the old floor slab could not be reused, or there was no existing slab, the homeowner was required to pour one. In some cases homeowners made their floors after construction. Employees of the contractor and trained community members provided guidance and oversight for the mixing and pouring of concrete.

Homeowners transported the materials from the 'factory' to their home. They then installed the tongue-and-groove wall sheeting onto the six wall-framing panels. Company employees and trained community members then assembled the sided frames (two for the side walls and four for the front and back walls) with assistance from company advisors. Families nailed the structures together and added the doors and windows.

Quality Control

Supervision and quality control were done by the contractor's staff. The contractor had one engineer and one project manager (who supervised), and five skilled workers who cut the timber. The homeowners transported the prefabricated shelter materials and assembled them on site. The only carpentry skill that homeowners required was the ability to hammer a nail and follow connection directions.

Monitoring took place through a team of approximately 30 volunteers, of whom 15 were active in the field on a daily basis. Of these, five or six worked with the contractor on a daily basis and mobilised community volunteers. The rest worked in the community, helping with registration, land rights and other emerging issues.

Safety and Liability

The contractor maintained control of the cutting and assembly yard and its employees, and controlled access to hazardous places. Since the contractor owned, controlled and supervised the operation they were the main liable entity.

Each community established a safety committee that controlled access to the cutting and framing site, as well as the assembly sites. In general, community activities were provided for youth and children to keep them entertained while their families were building their shelters.

Logistics

By delivering basic raw materials (rough timber, tongue-and-groove wall sheeting and corrugated iron, cement panels, nails, etc.) to the building site, logistics requirements were reduced. Warehousing was also reduced, since non-value-added raw materials took up less space than fabricated material components. Component costs were reduced by directly employing people on site to fabricate them. These people did this work as only a part of their salary. Everything was fabricated as needed on site and according to specification. This approach also provided a 'just-in-time' inventory system, but required the hiring of additional skilled staff by the contractor.

Bill of quantities

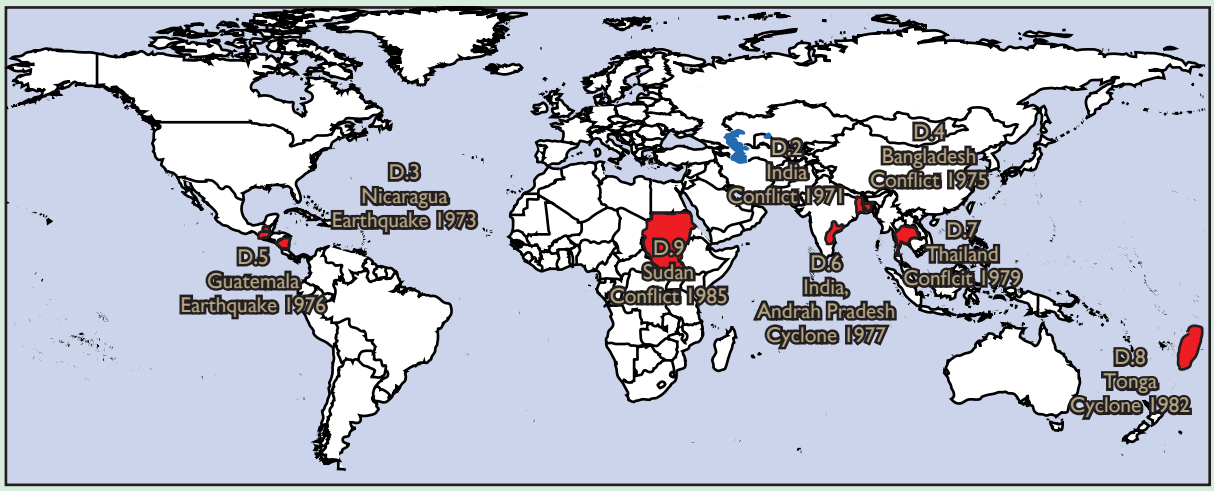
Item	Quantity
Wood (tongue and groove) 2.48m	68
Wood (tongue and groove) 2.3m	43
Wood (tongue and groove) 42cm	10
Wood (tongue and groove) 32cm	16
Wood (tongue and groove) 1.01m	16
Wood (tongue and groove) 2.48m to 2.30m	70
Nails	1kg
Wood strips 3cm x 6cm x 3m	2
Wall plates 6cm x 6cm x 2.5m	3
Hinge, steel 2.5"	7
Corrugated roofing 3m x 1m	6 sheets
Instructional manual	1
Plastic tape 1cm x 15cm	8
Screws	3

One toolkit was distributed per group of workers.


Photo: LeGrand Malany

One of the project's shelters (background) and a shelter walled with reed mats (foreground)

Section D
Historical Case Studies
From the Cuny Archive



D.1 Historical case studies - overview

Case studies from the Cuny Center

Summary

The main focus of this book has been on shelter responses after the year 2000. However, the loss of housing from natural disasters and conflict and the subsequent need for shelter is not a new phenomenon.

This chapter includes case studies from the 1970s and 1980s taken from the Cuny Center in Washington DC, USA. These case studies document responses during which the first guidelines used by humanitarian actors today were developed.

Although some of these case studies are from responses that took place over forty years ago, many of the issues and projects are similar and relevant to those being implemented today.

Need for guidance

There are occasional records of shelter responses going back to the 18th century, but concerted efforts to research and develop a best practise in the field only started in the early 1970s. Indeed, the earliest modern guidelines for shelter response for any humanitarian organisation, dating from 1959, merely suggested finding a military specialist and following his advice when it came to the spacing and grouping of tents in planned emergency settlements.

Post-colonial civil wars, notably in Nigeria and Bangladesh (then East Pakistan), and a number of large-scale earthquakes in the late 1960s and early 1970s, led to exponentially greater numbers of forcibly displaced populations and a correspondingly increased role for humanitarian organisations in the field. Without adequate guidance, it became quickly apparent that badly designed shelter and settlement programmes could cause more harm than good.

By 1973, NGOs like Oxfam and CARE, researchers like Ian Davis, and consultants like Fred Cuny were engaged in developing comprehensive guidelines for humanitarian response and continued practical research into issues related to shelter. Many of the concepts that are now accepted as standard practice today derive from the research conducted in the 1970s by Cuny, Davis and their collaborators.

Overarching principles

The two sets of overarching principles in the development of these guidelines were, firstly, that communities must be supported in regaining sustainable livelihoods, and that all efforts must be community-focused and take into account the community's own potential for self-help. Secondly, that above all else, shelter and settlement programmes must provide the beneficiaries with sufficient levels of hygiene and remove public health risks to the greatest degree possible, as this was the largest danger to human life after the occurrence of a disaster or forced displacement. The development of minimum standards for shelter over the subsequent thirty years, often expressed in numeric indicators, derived from this need to equitably protect the health and hygiene of those living in emergency and transitional shelter and settlements, with limited resources to support them.

First camp guidance

The first sets of guidelines, drawn up by Fred Cuny in 1971, were for shelters within the context of planned camps, but were based on the understanding that the development of a camp was a process taking place over an indeterminate length of time. The guidelines divided the type of shelter response into phases, depending upon whether the camp was subject to an initial emergency influx of population, whether the camp was being maintained and services consolidated, or whether the camp was being upgraded and expanded for longer-term occupancy.

In the face of well-meaning but misguided attempts to create a perfect universal prefabricated shelter and shelter design competitions conducted thousands of miles from any disaster, it was important for Fred Cuny and Ian Davis, with the support of various NGOs and then the UN, to use their own experiences in responses to earthquakes in Nicaragua (1972), Guatemala (1976) and multiple disasters in Bangladesh (1973-1975) to argue for shelter responses that helped affected communities build back better from day one, using local labour and materials, and supported by locally adapted hazard-mitigation construction training. If beneficiaries were to be relocated in camps, then the camps would have to be community focused, with the shelters clustered into small neighbourhood groups, and with space for livelihoods and public activities.

Meanwhile, the development of new materials, such as plastic sheeting, and the increasing professionalisation of logistics and communications systems in humanitarian response allowed agencies the potential for a more rapid, wider and larger response.

Lead agencies

By the end of the 1970s and the various crises in south-east Asia, the rapidly increasing number of agencies entering the field for the first time or with little previous experience forced advocates of best practice to change their emphasis, in order to ensure that the ensuing chaos was not as big a disaster as the original emergency. From that point on there would be the inception of 'lead agencies' from the UN that were clearly mandated with overall coordination and technical guidance. This would be facilitated by a decisive change of guidelines emphasis, towards universal, often numeric, minimum standards against which all agencies' performance could be held accountable, but which at the same time ran the risk of failing to take into account needs for local adaptation.

1980s

Throughout the 1980s, the numbers of refugees caught in protracted situations increased, while the willingness of host governments to provide options for permanent resettlement diminished. The UN first expounded a policy response of voluntary repatriation as the single preferred durable solution, and decried camps as the option of last resort. Under such circumstances, the focus of those working on best practice in the shelter sector started to pay more attention to the political aims to which settlements could be twisted. This was often based on their own experiences of witnessing unsustainable camps being used as 'pull factors' or to house hostage populations, in places like Sudan or the Horn of Africa.

1990s and Sphere

The crisis in Rwanda in 1994 gave the impetus to many organisations to capitalise on the movement started in the early 1990s with the Red Cross Code of Conduct. This aimed to not only systemise the qualitative and quantitative aspects of minimum standards across all sectors including shelter, but to also ensure the widest possible awareness of those standards, and the maximum possible adherence and buy-in among humanitarian organisations. This was done in the realisation that in complex emergencies the UN lead agency system could not always be relied upon to ensure adequate response. Knowledge of best practice among all actors was a prerequisite before the start of a programme, rather than something that could be just learned in the field. This would become the Sphere Project (www.sphereproject.org).

Transitional shelter and settlement

At the same time as the Sphere drafting process, other initiatives gave the shelter sector its first set of independent, sector-specific vocabulary since the 1970s. The shelter process for the affected communities and for humanitarian organisations is now seen as having transitional phases, with an insistence that the first emergency response must somehow demonstrate support for the eventual durable solution.

Urban challenges

The last four years have seen moves to widen the accountability and predictability in all sectors of humanitarian response through the development of the Cluster System. But those years have also seen greater challenges brought closer to the spotlight.

In the last two years, the number of people living in urban populations has reached 50% of the world's population for the first time, and many of those are living in hazard-prone areas on marginal lands. This is especially relevant with the potential threat to coastal settlements and extreme weather conditions attributable to global warming.

Experiences such as those in Aceh, Indonesia following the 2005 tsunami have raised important questions about the unintended effects of shelter responses in accelerating urban migration and extending the sprawl of the cities further into hazardous or environmentally fragile locations.

Fred Cuny

Fred Cuny trained as an urban planner in the mid-1960s, and worked professionally with disadvantaged communities in southern Texas, before his experience as a pilot of small planes gained him a position working with relief agencies during the Biafran War in 1970. Between 1971 and 1995, Cuny and Intertect, the consultancy that he set up, worked with NGOs, the UN, and major donors in a number of high-profile disasters. Through all of these, Cuny sought to develop guidelines for best practice and to advance the state of the art in humanitarian response. Cuny and Intertect were responsible for the writing the first-ever set of camp planning guidelines, contributed to *Shelter After Disaster*, and wrote much of the first draft of the *Handbook for Emergencies*. They were also early advocates for the promotion of minimum standards in humanitarian response, through guidelines and manuals. Cuny conceived humanitarian response as centred upon the affected communities, and serving to support them in a return to sustainable livelihoods. He advocated for camp designs that clustered shelters into small communities, shelters made of traditional materials that were built by the refugees, and the training needed to ensure that those shelters and houses would be built back safer and hazard resistant. Cuny also advocated a holistic approach to humanitarian response and worked to combine shelter responses with those for water/sanitation, food security, livelihoods and public health. By the early 1990s, he was increasingly involved in advocating for policy and intervention strategies in conflict and disaster. He was killed in Chechnya in 1995.

D.2 India - 1971 - Conflict - Refugees

Case study: First camp planning guidelines

Project type:
Distribution of building materials with training support

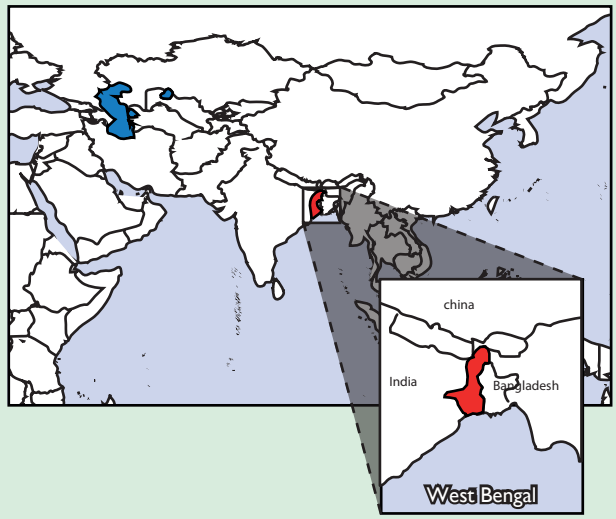
Disaster:
Civil war in Bangladesh (then East Pakistan)

No. of people displaced:
10 million people

Project target population:
Seven camps, each with 15,000 to 20,000 people, with one camp designed to be extended for up to 300,000 people

Occupancy rate on handover:
100%

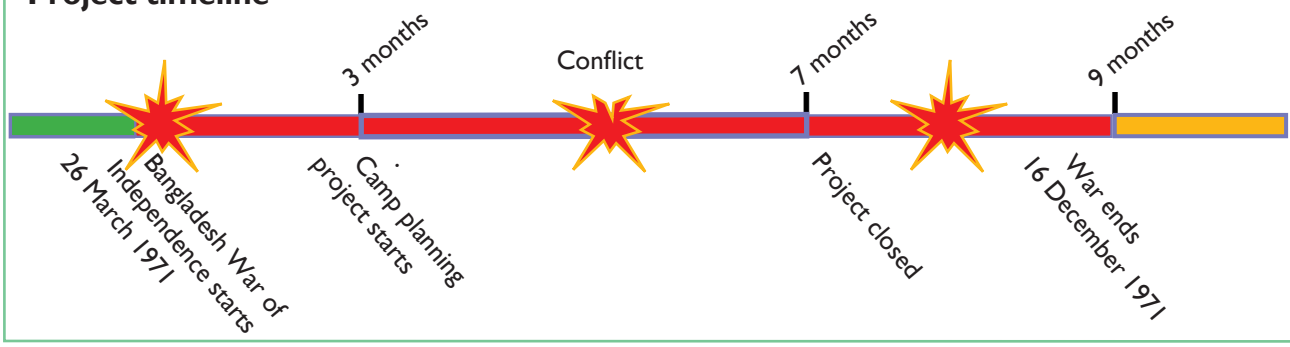
Shelter size
Various



Summary

Refugee camps were designed in decentralised 'village' groupings. Construction and upgrading was undertaken in three phases: meeting basic needs, sustainable upgrading and 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.

Project timeline



Strengths and weaknesses

✓ Camp construction is a process. Life-and-death issues should be addressed first, but other issues should not be ignored in later phases of construction or upgrading.

✓ Standardisation of shelter types in later phases of camp development facilitated the development of the land grids and road systems.

✓ The decentralised 'villages' design allowed for the provision of services with less effort by staff, as well as adaptation to land contours, organisation of refugee adminstrative groups, protection of minorities and use of areas between villages for agricultural activities.

✓ Describing the construction of camps over a timeline of 'phases' allowed the camps to be planned for an indeterminate and potentially long-term existence.

\- The majority of sanitation and public health issues were caused by the poor choice of land for the camp in the beginning.

× Poorly supervised construction contractors created an exploitative (and illegal) black market for refugee labour.

× In open camps near large cities, it was sometimes impossible to stop local non-refugees from posing as refugees in order to receive shelter and food that was more than they could have expected to receive as members of the homeless population back in Calcutta.

Case study credits: Cuny Center

Before the war

Smaller refugee flows into West Bengal from what was then called East Pakistan had been continuous since the initial partition period of 1948-49. Many of the refugees were of the Hindu minority in East Pakistan. However, from 1949 to 1970, resentments over discrimination by the West Pakistan government continued to rise. They came to a head in the aftermath of the Bhola Cyclone of 12 November 1970, where the West Pakistan government was accused of mismanaging the relief effort and neglecting the affected populations, despite the fact that an estimated 500,000 people were killed. This resulted in an East Pakistan political party (the Awami League) gaining a landslide majority in December 1970.

Demonstrations for independence were met with a severe crackdown by West Pakistan military forces, leading to the declaration of independence on 26 March 1971 and the resulting war. The war only ended once India, fearing further destabilisation from mass influxes of refugees, intervened on the side of East Pakistan between 3 and 16 December 1971.

After war breaks out

An estimated 10 million families, at a peak rate of tens of thousands per day, fled into West Bengal in India. Many arrived in self-settled camps in the vicinity of Calcutta. The Government of India and the Corporation of the City of Calcutta assigned land for camps, and the Indian Army provided basic supplies and administration.

A number of the camps were spontaneously self-settled. Both categories of camps were often on marginal lands and in low-lying areas prone to flooding.

The NGO had been involved in public health and water and sanitation projects in the camps, and had asked a consultant team to develop a more comprehensive strategy for camp planning and camp development. The consultancy worked directly on the implementation of various projects in the camps, ranging from the setting up of materials workshops to drainage excavation. They also implemented camp layout strategies from which a set of guidelines of basic camp planning principles was written later that year.

Because of the continuous influx of refugees over a number of months and the sheer size of the displacement, many of the camps quickly became overcrowded. Matters were made worse by cholera outbreaks and the major flooding of many of the camps during the rainy season in September. Repatriation of the majority of the refugees started after the end of the war.

Selection of beneficiaries (and assessment)

In the larger camps, the 'villages' layout was used to advocate the separation of Hindu and Muslim groups within the same camp. There were concerns about ensuring equal support for both groups.

The inhabitants of some of the smaller and more basic Phase I and Phase II camps were selected to be moved to the larger Phase III camps when the first camps were closed down.

Land rights / ownership

Later reports stated that the Indian government had been at pains to insist upon the non-permanent nature of the camps, and had restricted the use of 'permanent' construction materials in the camps. After the end of the war, and the establishment of independence by Bangladesh, the great majority of the refugees were repatriated voluntarily. However, more than 1 million refugees (mainly Hindus) chose to remain in India. A few of the old camps have since been incorporated into the expanding local cities, although the inhabitants' housing rights are unclear.

Technical solutions

The construction, upgrading and maintenance of the camps were divided into three phases, with the following emphases:

- Phase I: These were described as being the first emergency camps built at the start of the influx, with little prior thought given to siting or facilities. Sanitation was often poor, shelters were very basic and facilities were inadequate. The most pressing issues were the construction of drainage, the upgrading of shelters and the need for more space and sanitation facilities.
- Phase II: These were camps with more stable populations. They had more rational designs. Shelter materials were distributed, basic drainage and sanitation were constructed, and roadways and public facilities were improved. Attention was also given to providing opportunities for both livelihoods and social activities.
- Phase III: With well laid-out roads and better drainage, focus moved to higher-standard public facilities and the considerations of creating more permanent settlements, if required. With a more stable camp population, different village areas could be used for cooperative experiments on different types of shelter or shelter groupings, to best adapt to the residents' needs.

In all phases, the design aimed to have the shelters grouped into small decentralised villages in order to support the refugees' self-administration, as well as to aid drainage and construction over uneven land. The decentralisation of services also meant that the refugees had greater access to those services, resulting in less unrest and greater health benefits.

This was also the first time that the clustering of shelter layouts in this way had been advocated.

Implementation

The camp construction and administration was undertaken by the Indian authorities and much of the work was done by Indian Army engineers.

A process was eventually initiated to close down smaller Phase I and Phase II camps in flooded areas.

In the Phase III camps, workshops were set up to make bamboo matting for use in shelter construction – enough for 8,000 shelters in less than one month in one camp. Some of the works were done by paid contractors, but much of the local construction and upgrading was done by labour teams organised around the villages.

Materials

The first shelters were made from thatch, bamboo and recovered materials. Later phases of shelters included polythene sheeting and some corrugated tin roofing sheets, as well as

Clustered camp plan

the bamboo matting. These were used for roofing, partitions and flooring in the shelters and latrines, and for the lining of drainage canals.

Logistics

The construction of the larger Phase III camp benefited from its proximity to Calcutta in terms of the procurement of its construction materials. The ability of that camp to develop rapidly was attributed to the authorities' willingness to commit full-time professional technicians and army engineers. Imported materials were later augmented by the bamboo matting made in the camp workshops.

D.3 Nicaragua - 1973 - Earthquake

Case study: Small camp

Project type:
Shelters in community-grouped camp

Disaster:
Earthquake in the capital city of Managua

No. houses damaged:
50,000 destroyed; 24,000 damaged

Project target population:
180 families initially, then 360 families in tents
Later, 310 families in polyurethane igloos

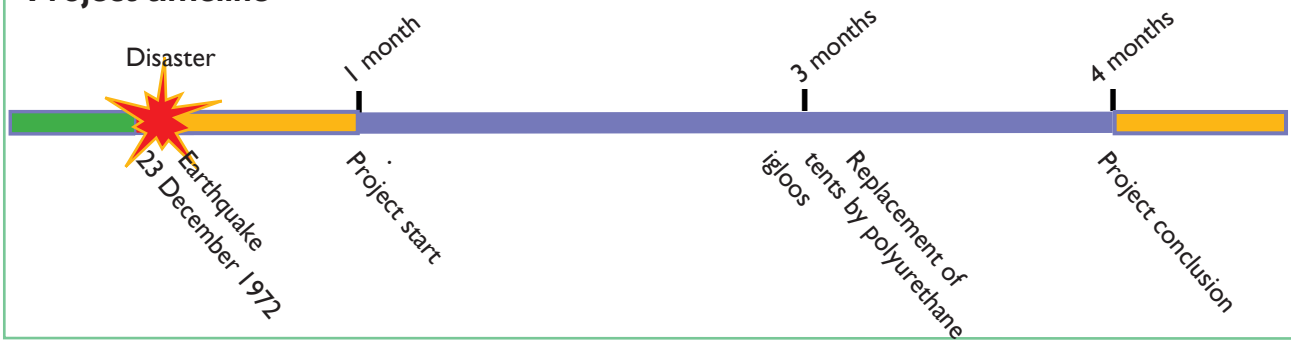
Occupancy rate on handover:
60% of tents; 45% of replacement igloos

Shelter size
Tent: 12m² (approximate size)
Igloo: 20m² (approximate size)

Summary

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. This 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.

Project timeline



Strengths and weaknesses

✓ Group clustering of tents allowed displaced families to give mutual social support.
✓ Adequate space was provided in the camp for public amenities, which were easily accessible by all.
- Lighting, water and sanitation were provided, through cooperation with the national government.
- The camp was easily accessible for logistics, but not for occupant livelihood opportunities.

× Full occupancy was never achieved, because of family preference for host-family situations where possible.
× Prefabricated polyurethane shelters were delivered too late and were inappropriate in design in terms of beneficiary acceptance, cost per unit, potential for expansion or maintenance and fire hazard.
× There was no potential for the support of early reconstruction on families' customary land.

Case study credits: Cuny Center

Before the earthquake

Large-scale urban migration during the 1960s had increased the population of Managua from 170,000 to 430,000 in the decade before the earthquake. This left a deficit of 80,000 houses, with many additional people in substandard housing. More than 25% of the national population were living in the capital city area.

During the last months of 1972 Nicaragua had been experiencing a drought. As a result, some aid organisations were already present in the country at the time of the disaster.

Before the earthquake, the site for the camp had been the grounds for the Nicaraguan Boy Scouts, who retained formal ownership of the site during its use for displaced families. The land was already cleared for use and there were some facilities in place, such as a number of permanent latrines, before the first arrivals of earthquake-affected families.

After the earthquake

With more than 250,000 people homeless, the national government made the decision to move many of the homeless to tent camps near the city or in the outskirts. However, 130,000 affected people chose instead to stay with extended family members.

All other camps were laid out along strict military lines. However, one camp, the one at Coyotepe, Masaya, was designed by the NGO consultant Fred Cuny to be laid out in square 'clusters' of 16 shelters each, with the explicit intention of providing the physical structures for community self-support. This was the first time that such a layout concept had ever been implemented and it has provided the basic template for all other cluster-based designs since. The design also took into account firebreaks, security lighting and adequate public spaces for recreation and community activities. Meanwhile, many of the other camps experienced much lower occupancy rates and early abandonment of shelters.

By the end of 1973, the vast majority of camp residents had left the camp, mostly to return to Managua.

Selection of beneficiaries (and assessment)

The beneficiary group appear to have been self-selected, having moved to Masaya in the first few days after the earthquake.

Land rights / ownership

The site was designated as a camp by the government, who also provided support with sanitation and other services. The government decided to rebuild Managua on its original site and plan, in theory permitting families to return to their customary locations within the city. By the summer of 1974, the Nicaraguan Boy Scouts, who owned the site, were planning to bulldoze the remaining shelters and evict the last few families.

Technical solutions

Tents were provided by the US Army within four weeks of the disaster. However, these were seen as inadequate to last through the rainy season.

After four months, polyurethane igloos (previously used in Peru in 1970) were constructed for the beneficiaries by international staff using specialised machines.

Although the internal shelter space of the igloos was larger than that of the tents, the igloos had much lower occupancy rates. This was in part due to the lateness of the delivery, but also because the design was not one that related to standard housing shapes for the beneficiaries. The igloos were not easily extendable or maintainable, although there were reports of parts of the igloos being broken off to make materials for other shelters. The igloos were also criticised for being flammable.

Camp layout

The camp was laid out using square clusters of 16 shelters, with a central space for administrative buildings and social/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 the 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 into 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.

Implementation

The tents were erected by the occupants of the camp, the US Army, and the Nicaraguan Boy Scouts, who also worked together to install basic drainage.

The extra space needed for the construction and deployment of the igloos also caused some displacement of shelters from the original cluster design.

One NGO provided camp management support in the form of a reception committee to assess the medical and social needs of or new arrivals. Information was distributed via notice boards and a camp newspaper.

There was no initial plan for the delivery or upgrading of some facilities, so the NGOs had to negotiate with the government (not always with success)to extend water lines into each cluster, build shower units and construct a septic tank. However, the question of waste incinerators was left unresolved.

Logistics and materials

Delivery of both the tents and the igloos came at a relatively late stage. Permanent toilets previously constructed on the site were used, but other permanent buildings were not. In terms of the support and maintenance of the camp, the site was located along a main road 3km away from the town of Masaya and 20km from the nearest airfield. The camp remained reliant on the delivery of food and water and removal of waste solids by truck.

Materials	Quantity
Phase I – Sears Co. high-wall chalet tents	360
Phase II – Bayer Co. polyurethane igloos	310
Latrines, water facilities, lighting, also supplied	No data

D.4 Bangladesh- 1975 - Conflict - People displaced

Case study: Shelter upgrades

Project type:
Cyclone-resistant shelters in camps for the displaced

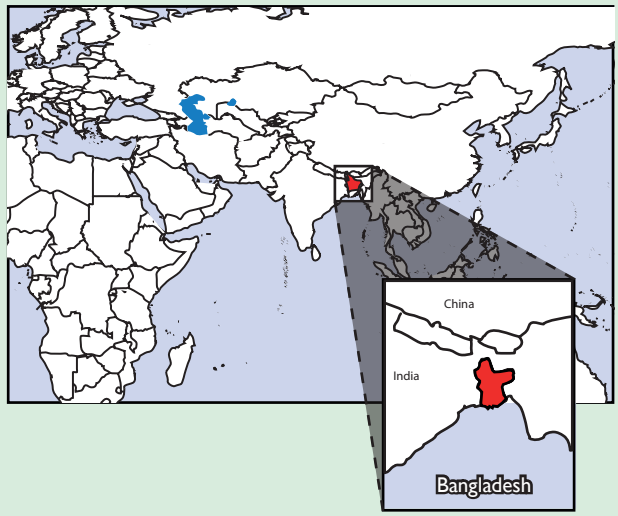
Disaster:
Bangladesh War of Independence, 1971

No. of people displaced:
Hundreds of thousands

Project target population:
Three camps

Occupancy rate on handover:
100%

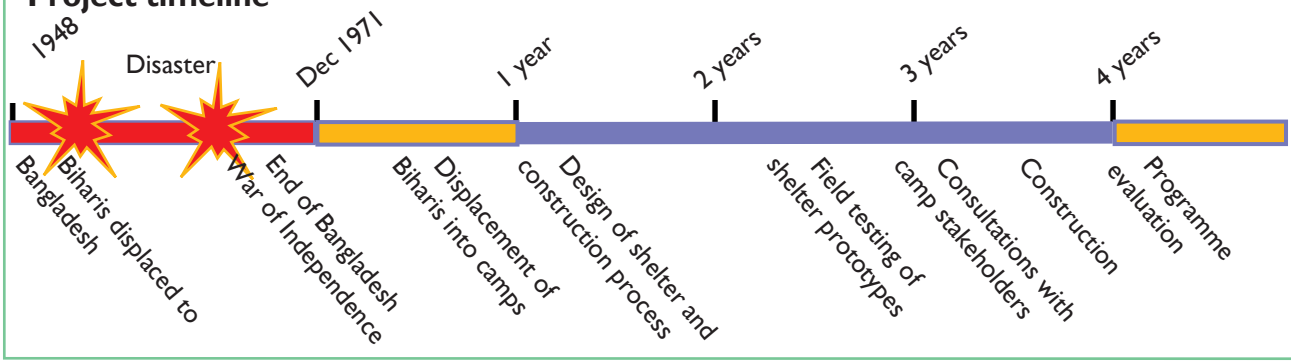
Shelter size
Various



Summary

Long-term camps for displaced stateless populations were upgraded using cyclone-resistant shelter designs made from local materials in order to reorganise and upgrade small camps along community cluster designs.

Project timeline



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 the 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.
× The A-frame design was structurally sound but reduced indoor space and made extension of shelter difficult.
× Lack of involvement of the target population in the design process resulted in lower levels of beneficiary satisfaction post-occupancy.

Case study credits: Cuny Center

Before the upgrading of the camps

Hundreds of thousands of Urdu-speaking Biharis migrated from eastern India to what was then East Pakistan during the partition period of 1948. During the Bangladesh War of Independence in 1971, the Biharis sided with the Government of Pakistan. After the surrender and evacuation of Pakistani armed forces, the Biharis were left behind, declared to be enemy citizens by the new Bangladesh government, denied the right to resettle in Pakistan by the Pakistan government, and were rendered stateless.

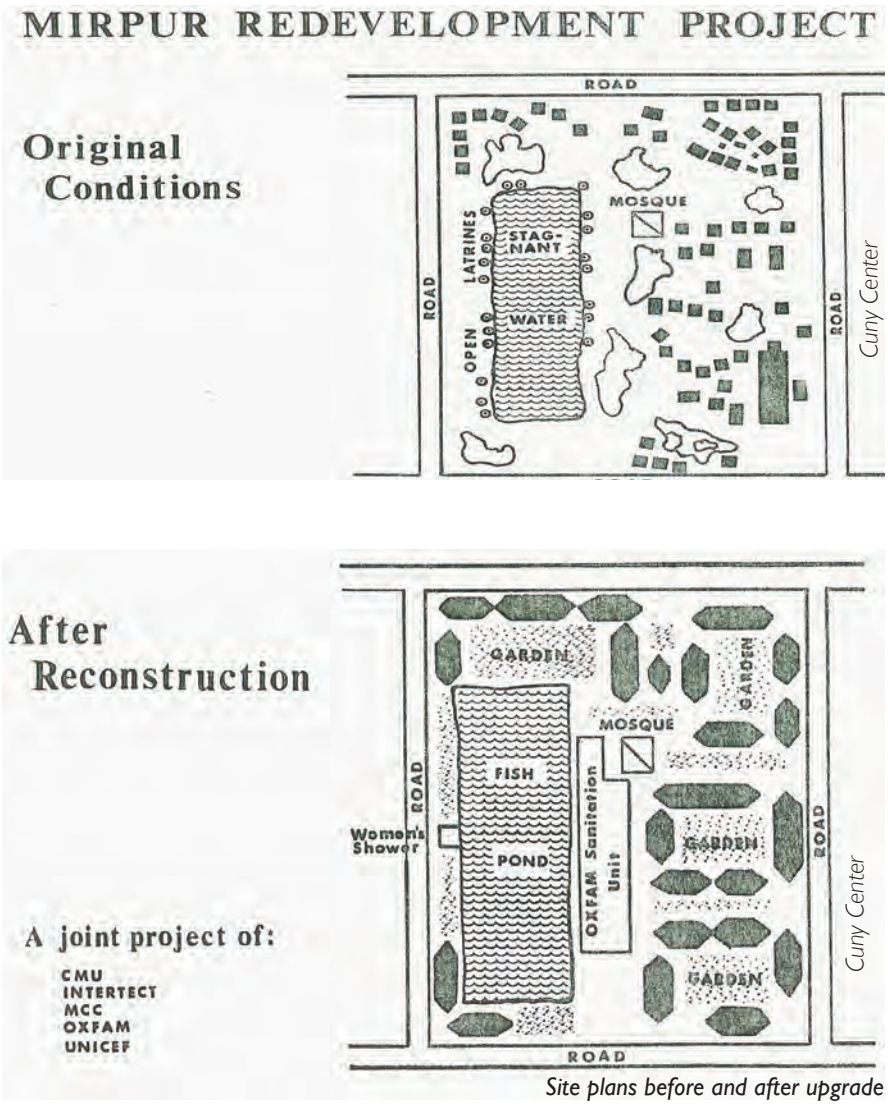
During the 1972-1974 period, the Biharis were displaced into camps, often under force from the Bangladeshi authorities. A number of those camps were scattered on marginal lands on the periphery of Dacca. In 1972, some NGOs had given shelters or shelter materials to the camps, but the camp layouts were often poorly organised, and the shelters themselves had not been upgraded since that point.

In 1974-75, local police forced some of the Biharis into new camp sites. This had the initial effect of making NGOs reluctant to support the camps, in case they were seen as supporting the government policies. This attitude only changed after April 1975, after storms had caused major damage to some camps.

The Intertect consultancy had been working with US university researchers on the development of emergency shelter designs and implementation processes since late 1973. In 1975, they were given donor assistance to deploy shelter prototypes in the field. After that, Intertect persuaded NGOs working in three different camps to use their designs for shelters, camp layout and construction processes.

The aims of the research project had been to design shelters that:

- would be sustainable and resistant to hazard;
- could be constructed by the beneficiaries;
- would instruct the beneficiaries in hazard-resistant design through the construction process; and
- could be made in large numbers, and could be made out of low-cost, local materials.



Site plans before and after upgrade

After the upgrading of the camps

There continued to be very minor technical issues with the structures themselves. These issues, such as the angle and placement of the windows, were easily fixable by the occupants. However, it was noted that the families did little if anything to improve or adapt their shelters.

Later assessments showed that although the beneficiaries were generally satisfied with their new shelters, the A-frame design made it difficult to make extensions or additions. There were also complaints that although the A-frame was highly resistant to high winds, it also reduced the head height.

In general, the lack of beneficiary participation in the design process was seen in the reduced sense of ownership or responsibility after occupancy.

Selection of beneficiaries (and assessment)

People were largely self-selected by arriving at the camp. All families in the camp were eligible for the new shelters. Assessments of beneficiary satisfaction (and the reasons for any dissatisfaction) were included in the project's final report of October 1975. Members of the consultancy team made further assessments in 1977.

Land rights / ownership

The Bihari camp residents continue to be stateless (recent rulings give the option of Bangladeshi citizenship only to later-born generations) and do not own the land.

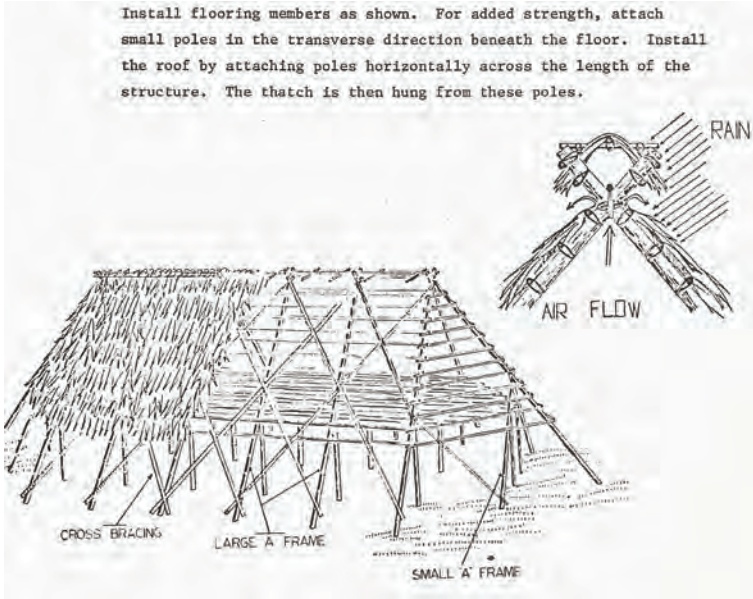
Technical solutions

Multi-family shelters were designed using bamboo poles, palm thatch, matting and jute rope. The design was that of an A-frame with cross-bracing, which had performed best in strong-wind tests back in the US.

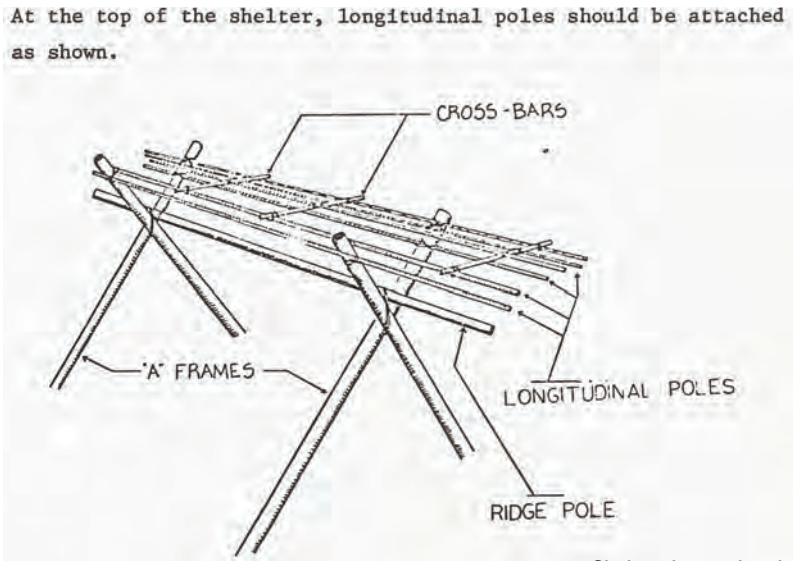
The shelters built in the camps also had raised floors to protect the families from flooding. A small number of alternative models were made with varying lengths and for varying numbers of families.

The consultant recognised that most post-natural disaster situations generally required single-family shelters that could be built on each family's plot. But it was felt that in the planned camps for the Biharis, with very limited amounts of space, the multiple-family shelters were appropriate. The same basic design principles could be used for single-family shelters if required.

The layout of the camps was based upon small U-shaped clusters of shelters. These were later simplified to square clusters in some camps. Space within the U was intended for the use of women, particularly those observing purdah. The areas outside the U shape, along the access routes through the camp, were intended for use by the men. In this way, the public men's area was also intended to be made available for workshops or other livelihoods activities, and also gave each community more control over the public space nearest their shelter cluster. Washing and cooking areas were contained within each cluster.

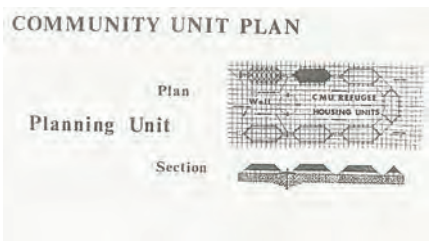


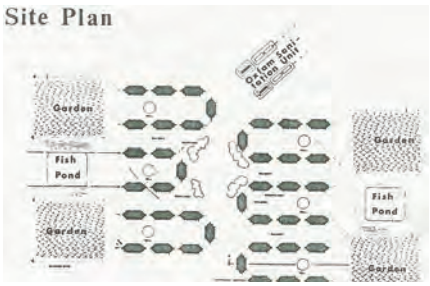
Cuny Center



Cuny Center

Shelter design details





U-shaped community block plans

Implementation

Two prototypes of the shelter were built in the field under the supervision of the university/consultant team and were occupied by refugee families. Based on observations of environmental issues, minor changes in structure were made. After further consultations with camp stakeholders (local government officials, NGOs, camp residents), the upgrading was started in phases, with sections of the camp being upgraded in rotation.

It was estimated that it would take a multi-person team two days to build one shelter, with different small teams assembled to take charge of different simultaneous tasks. However, problems were encountered in instructing the work teams in both the design and the construction techniques. The manuals previously designed in the US were too cumbersome and too detailed.

The work teams preferred to be trained verbally, but this slowed down the rate of construction. This meant that large-scale production of the shelters would be impossible or would have to rely on large numbers of trainers and supervisors. Eventually, flip charts with simplified graphics were also developed for use in the project.

Logistics and materials

The basic materials were provided to the refugees by the humanitarian organisations. All materials were available locally.

D.5 Guatemala- 1976 - Earthquake

Case study: Materials distribution and training

Project type:
Distribution of building materials
Training support

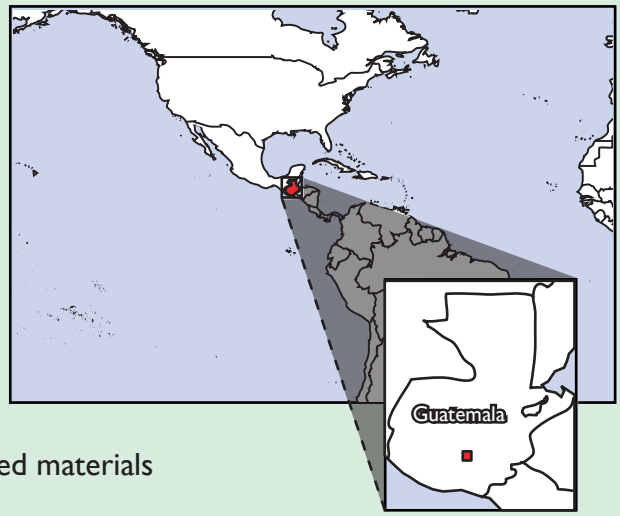
Disaster:
Earthquake in Guatemala

No. of houses damaged:
222,261

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

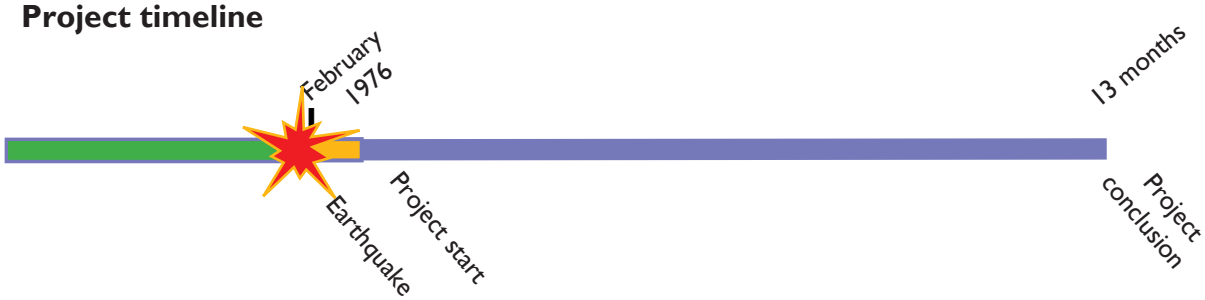
Shelter size
Various



Summary

Housing materials were distributed, and training and advice were provided through locally hired teams. The aim of this was to accelerate reconstruction and provide community-wide training on seismic-resistant construction techniques.

Project timeline



Strengths and weaknesses

✓ Permanent reconstruction was able to start on an immediate basis. Even when the roofing sheets were initially used to build a small shelter, they were then reused to build the permanent house.

✓ Self-build methodologies allowed for support to a greater number of beneficiaries and gave them training on how to 'build back safer'.

- Small group cooperative reconstruction projects worked better in rural areas than in urban areas.

- Once organisational budgets were reduced towards the end of the programme, it became obvious that it was cheaper to build using skilled, higher-paid workers, than apprentices on low wages.

× Although the distribution of educational booklets was widespread and popular with other organisations, they did not always support this by interactive training. This reduced the booklets' impact on those using them at a distance.

× Lack of coordination between agencies and differing methodologies (free distribution of materials vs. subsidised resale) reduced programme impact in terms of training and self-reliance for beneficiaries.

× Lack of clarity on the principles behind the seismic resistance guidelines led to some questioning of the need or usefulness of improvements.

Case study credits: Cuny Center

Before the earthquake

During the preceding decade, Guatemala City and other urban areas had seen rapid increases in population, with many of the new arrivals living in hazardous areas on steep slopes at the edges of the city. Even in the rural areas, many had built their houses out of adobe, often with heavier tile roofs, without the inclusion of seismic-resistant features.

Prior to the earthquake, a number of smaller INGOs, as well as local community-based organisations, had been active in development programmes (but not necessarily shelter-related) in the affected areas. While the official language of the country is Spanish, many of those in the rural affected areas had limited command of this language and preferred to communicate in local Mayan dialects.

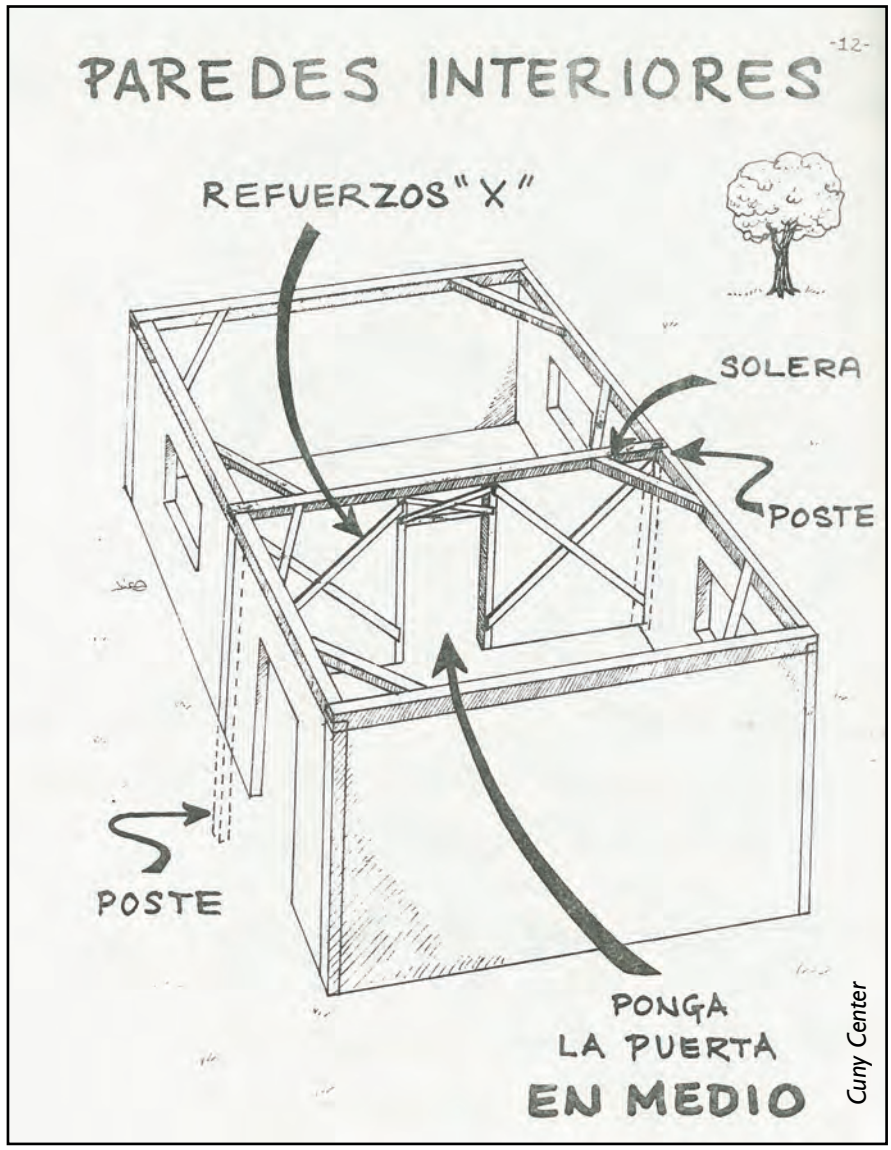
After the earthquake

The earthquake struck the Central Highlands of Guatemala, killing 23,000 people and leaving more than a million homeless. Some 58,000 houses were destroyed in Guatemala City and 163,000 in the rural areas.

Initial official relief efforts were further hampered by the number of roads and rivers blocked by landslides. The emergency response from the US and other governments was swift, with 5,000 tents transported to Guatemala City within seven hours of the earthquake.

As equally rapid as the external response was the rate at which affected families started building impromptu shelters themselves. Around 50,000 shelters were built within the first 24 hours of the disaster. Although this meant that much of the affected population were quickly under shelter, it led to a rapid increase in the price of corrugated galvanised iron roofing sheets. There were additional concerns that this would cause scarcity for the reconstruction effort and cause the materials to be too expensive for many of the affected people.

Because of the high-profile nature of the disaster many organisations without prior field experience sent personnel to the disaster. The government was generally unable to enforce coordination between organisations.



Sketch showing earthquake-resistant techniques bracing

The international NGO in question partnered with a regionally-based NGO that already had ongoing programmes in Guatemala (it was implementing the earthquake shelter programme), in order to accelerate programming and ensure incorporation of local knowledge.

Selection of beneficiaries

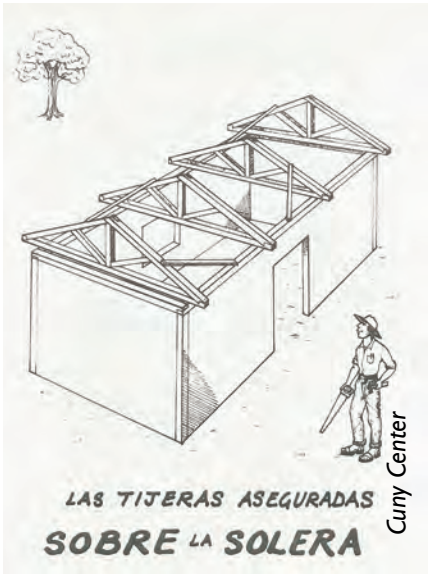
Four affected rural areas were assigned to the NGOs by the national government. A partial registration of beneficiaries was helped by an implementing partner and the fact that local cooperatives were already present in the area. In some areas there were issues of competition for beneficiaries or of beneficiaries switching NGOs when others appeared with free distributions or other attractive options.

Land rights / ownership

Many of the affected population were squatters in peri-urban areas who often built back on traditional sites with no guarantee of tenure. At least one researcher involved in the programme counselled against wholesale rationalisation of the street systems in those areas, because it would mean depriving many families of their customary plots. Land holdings in rural areas may also have been traditional for the most part, but this issue was not as acute in those areas.

Technical solutions

In light of the scale of the self-building of shelters, the NGOs in question made a decision to support these efforts by distributing construction materials, supported with technical training.



Sketch showing structural roofing details

The programme had six key pillars:

- Salvage materials from destroyed or damaged homes;
- Use indigenous materials (apart from the roofing);
- Mount an extensive educational programme;
- Build a model house in each community using techniques (such as the introduction of timber and barbed-wire bracing) that would ensure safety the next time;
- Use the model house as a focus of further educational activity;
- Distribute the corrugated galvanised iron roofing sheets at subsidised prices through the cooperatives.

Construction materials were sold at subsidised prices to ensure that the people had a true need of the materials, to reduce the sense of dependency and to spread meagre budget resources to a wider population. There were limits to the amount of each article that each family could buy, in order to limit hoarding or speculation.

A full set of housing materials, in sufficient quantity and variety to build a whole house, was sold through the local cooperatives. But the main material, which was imported and distributed by the NGO, was the roofing sheets. The thicker 26- or 28-gauge sheets were preferred over the 30- or 35-gauge sheets. (Note: With standard wire gauge and corrugated iron sheet, the higher the gauge, the thinner the sheet.)

At the beginning of the programme, a total of 67 separate recommendations for seismic-resistant features were drawn up by a consultant for the NGO as the basis for the training programme. The intention was that even if not all of the recommendations were followed, the house would still be substantially safer. There was some disagreement, as some NGO staff thought that the list of recommendations was too comprehensive and was being used too strictly in the field. Some thought that a smaller number of recommendations might support a larger number of beneficiaries.

The NGO created four different model houses, although the families eventually built a wider range of adapted designs. A booklet was also developed and over 100,000 copies were eventually distributed as an element of training programmes.

Implementation

The beneficiaries were provided with information and training on seismic-resistant construction, using local materials and technologies (demonstrated by the model houses). But the responsibility for the design and for reconstruction remained entirely with the beneficiaries themselves.

The local cooperatives distributed the corrugated galvanised iron and other materials and also become the focal points for the training programmes.

In many affected communities, model houses were built using local labour, as directed by the NGO and in coordination with village master craftsmen. Once these craftsmen, masons and carpenters had been trained they were then employed to train a series of apprentices while working on the reconstruction of the houses in the community.

Unfortunately, many of the trained masons found better-paid jobs in the cities and left the rural work programmes. Eventually, a local company had to be engaged and supported to take on the work for that part of the programme. The choice of the materials that were distributed and resold through the cooperatives was also geared towards seismic-resistant construction.

Logistics and materials

The corrugated galvanised iron sheets were imported from El Salvador. Some 95,000 sheets were bought and resold by the NGO during the first six months of the programme. Funds recovered from the resales were eventually used to expand the operation. Construction materials were sold through local, pre-existing cooperative societies. This was intended to raise the profile and develop the capacity of those cooperatives, but concerns were voiced a few years later that this had ended up overstretching their capacities and flow of funds.

Options for roofing materials - tiles, palm leaves, thatch, corrugated iron

D.6 India - Andhra Pradesh - 1977 - Cyclone

Case study: Materials distribution and training

Project type:
Distribution of building materials
Training support

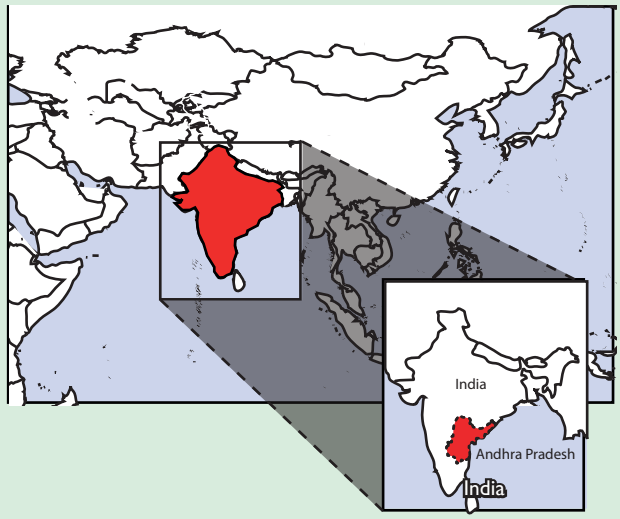
Disaster:
Cyclone in Andhra Pradesh, India

No. of people displaced:
3.4 million people in total; 20,000 in the administrative area where the NGO was working. Virtually 98% in areas affected by the tidal wave.

Project target population:
2,000 households

Occupancy rate on handover:
Not known

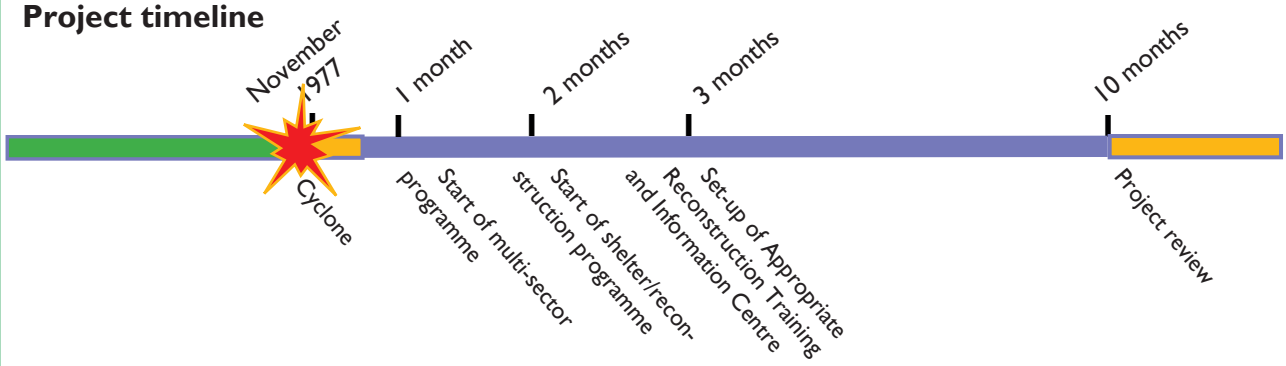
Shelter size
25m² (constructed from distributed materials)



Summary

The distribution of basic kits of local materials, supplemented by materials for strengthening cyclone resistance, was supported by the inter-organisational creation of a special centre to provide 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 the availability of appropriate materials.

Project timeline



Strengths and weaknesses

✓ Where recoverable materials were available, affected communities were able to reconstruct sufficient shelter for themselves.

✓ Livelihoods, and the recovery of the rice crop and paddy fields, were recognised as being of primary importance to long-term sustainable recovery. The shelter construction schedule was adapted accordingly.

✓ Traditional materials choices and traditional building methods were supported and strengthened.

✓ Using inter-agency coordination to set up a specialised technical training centre created a neutral forum where all actors could get information and could receive evaluations of their progress without bias.

× Resources were wasted, and beneficiary dependency encouraged, by the distribution of materials where affected populations had already rebuilt their own shelters in the first phases.

× Gaps in coordination prevented a systematic and equitable response to all affected areas, and in some cases resulted in the provision of inappropriate housing types and response methodologies that were damaging to the recovery process.

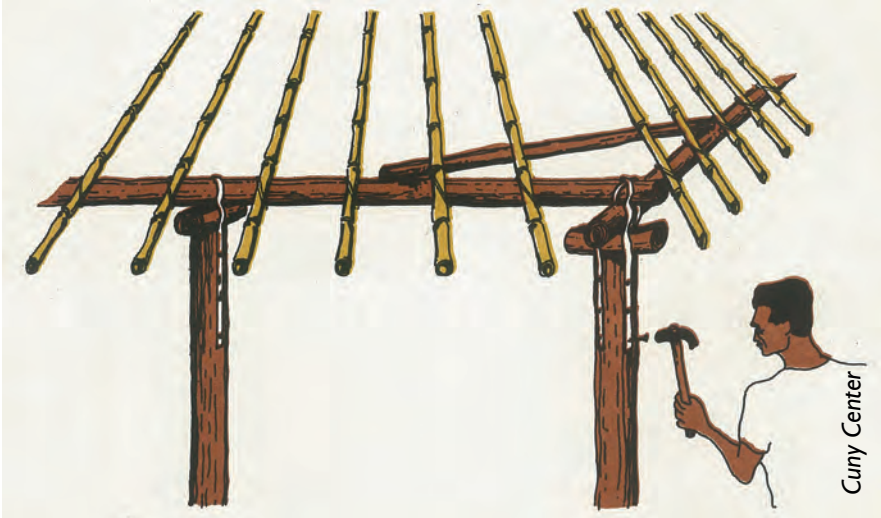
× The promise by some organisations that 'pukka' houses for the beneficiaries would eventually be constructed actually held back the process of recovery in wider ranges of affected communities.

Case study credits: Cuny Center

Before the cyclone

The affected population was predominantly rural, farming rice and keeping livestock to supplement their income. The affected areas were all low lying and were intensively cultivated.

The vast majority of the population lived in houses made of traditional materials. Common materials were bamboo and palmyra leaf thatch (made from a certain type of palm tree). Before the cyclone there had been official encouragement to make houses 'pukka' - made using reinforced concrete. Pukka housing was also preferred by much of the population and displayed a higher social status.



Safer shelter techniques - strapping columns to beams

Some of the faith-based and local organisations that were involved in the emergency response had been working in the area since at least 1969. Many of the larger international organisations were new to the area.

After the cyclone

The cyclone created two different areas of damage: an area damaged by a six-metre tidal wave that travelled as far as 24km inland at its furthest point; and an area damaged by high winds reaching over 270km/h, all along a 50km stretch of coastline.

In the areas affected by the wind alone, many of the materials from the destroyed houses were still lying nearby. About 90% of the surviving population very quickly built their own shelters using this material and removed the need for 'emergency' shelter support.

In the areas affected by the tidal wave almost all of the original housing materials had been washed away, so the survivors were in need of shelter materials.

The local government distributed poles and palmyra thatch during the first few days, with aid agencies joining in later. The NGOs had started programming in the health and medical sectors, but quickly changed their focus to shelter.

The local government requested that the humanitarian organisations construct pukka housing for all beneficiaries and offered 50% matching funding to all organisations who chose to do so. There was also pressure from the government and from international donors (and from within some organisations) to start construction immediately, using outside contractors or non-local volunteer forces if necessary.

It was recognised that the tidal wave had left dangerous levels of salinity in many of the communities' paddy fields, and that the greater need was to recover what was left of the previous rice crop, and then to unblock irrigation canals and flush out the paddy fields. Some feared that the large labour force needed for the immediate construction of concrete housing would divert efforts from the agricultural efforts and, in doing so, block long-term recovery. Therefore, a two-pronged strategy was advocated and involved:

- supporting the beneficiaries in their own reconstruction, and on a schedule of their own choosing, through the distribution of materials and technical support; and
- encouraging the adaptation of the reconstruction schedule to the agricultural calendar.

Selection of beneficiaries

Lack of capacity by the local government, combined with the large number of newly created organisations looking to help and 'adopting' random villages, made beneficiary selection problematic. Selection was also made more complex by the fact that some communities were displaced into local towns or large villages, but were still travelling back to their original locations every day to tend their farms.

Tensions rose over the course of the response, due to the different levels of support given to communities affected by the tidal wave and those affected by the high winds. Additional tensions arose between communities who had made agreements with different aid organisations, which had different types of programme methodologies.

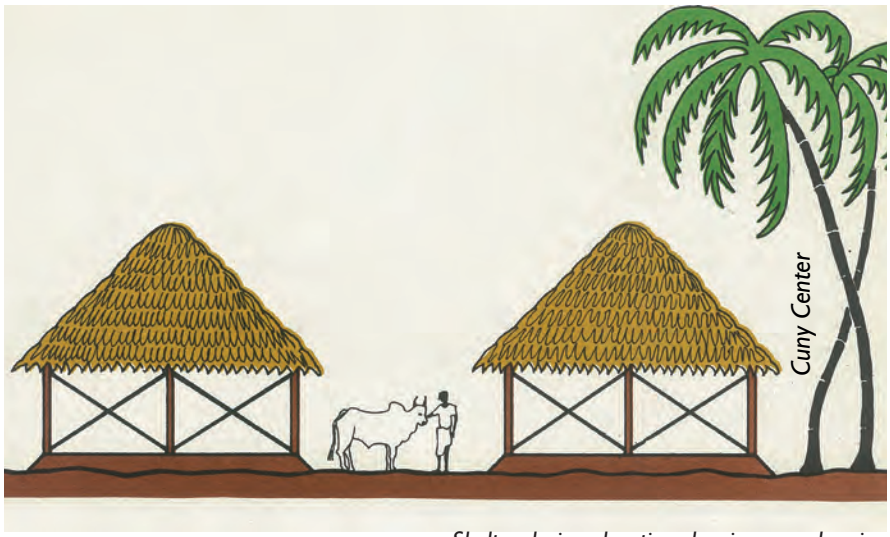
The NGO initially targeted the most vulnerable members of each village for the materials distribution, asking the local Rotary Club to work with the villages to select 20 of the most vulnerable households from each village, according to agreed-upon criteria.

Land rights / ownership

Affected communities were aided on their customary locations, although some agencies constructed shelters in the early stages of the emergency in grid patterns near the affected villages, without full consideration for land ownership questions. By December 1977, the local government was insistent that those who had fled to the towns or cities at the beginning of the emergency should be strongly encouraged to return to their villages and not remain permanently in the towns.

Technical solutions

Basic kits of traditional materials were distributed to the communities. It was recognised that in some cases distribution would have to be timed to take into account both the agricultural work cycle and the time needed to cure the bamboo for construction.

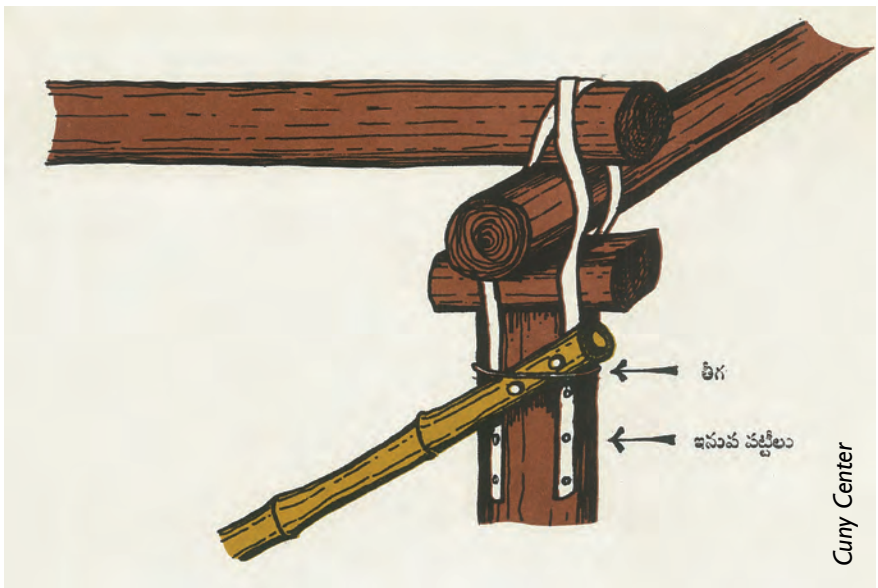


Shelter design elevation showing cross-bracing

The initial construction efforts were evaluated three weeks into the programme. Based on the evaluations, improvements and additions were made (cross-bracing and the protection of the housing posts below ground level) in the guidelines and prototypes.

Based on the interest of a wide range of shelter actors and the local government, an Appropriate Reconstruction Training and Information Centre (ARTIC) was established to give advice and conduct evaluations for the various ongoing shelter programmes. ARTIC was funded and supported by a loose consortium of major INGOs and local partners. ARTIC not only worked directly in consultation with the various organisations, but also produced booklets on safer housing construction for local distribution.

The design of the model house that the NGO provided to the beneficiaries was square, with a pyramid-shaped roof of a 45-degree slope to be both wind-resistant and to allow water runoff from the palmyra thatch. A ring beam and aluminium strips to bind the joints were added to the cross-bracing. The wooden posts were treated for infestation and rot and were sunk 1m into the ground. The palmyra thatch was attached to the roof using traditional sewing methods, despite the sewing materials' lack of great strength.



Connection detail

The architect hired by the NGO felt that because parts of the roof had actually blown off, this had reduced the internal wind pressure and had saved the larger structure of many of these types of houses during the cyclone.

Implementation

Direct implementation was done by the families themselves, with technical assistance from local carpenters. The beneficiaries were also responsible for shelter quality and for any adaptations of their shelter. The NGO, and later ARTIC, provided technical information through direct field visits, training of local carpenters, the development of booklets and posters, and in one case the production of a short play to impart important construction messages.

Logistics and materials

Similar sets of materials were initially provided by the local government in the first stages of the emergency. This delivery was taken over by the NGOs, and was augmented with the materials (bamboo, metal straps) necessary to make the shelters cyclone resistant. One of the arguments for delaying the reconstruction was that the materials used in traditional construction were strongest or best for use as construction materials. In the case of bamboo, this would have needed to be bought some weeks in advance and then cured before use.

Materials list

The following list shows the main materials provided and the ones that were of most value in the construction of adequate and cyclone-resistant structures.

Materials
Wood posts
Bamboo bracing
Wood roof frame
Palmyra leaf roofing material
Metal binding straps
Plastic sheeting (used to protect wood posts below ground level)

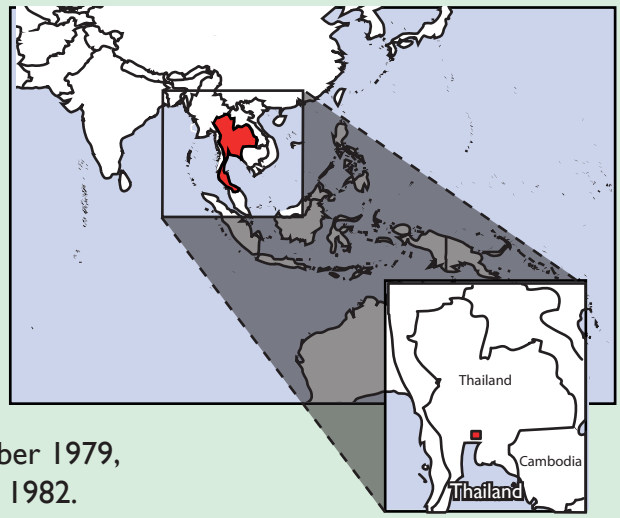
D.7 Thailand - 1979 -1980 - Political conflict

Case study: Refugee camp

Project type:
Construction of two refugee camps
Development of a manual of standards

Disaster:
Invasion of Cambodia by Vietnam, December 1978

No. of people displaced:
About 1 million people crossed the border into Thailand at the height of the displacement.



Project target population:
Khao-I-Dang refugee camp went from 29,000 people shortly after its opening in December 1979, to 130,000 -160,000 in March 1980, to 42,000 by 1982.
Sakeo camp had 28,000 people shortly after opening, dropping to 17,000 when it closed in July 1980 (the remaining 17,000 were transferred to other camps).

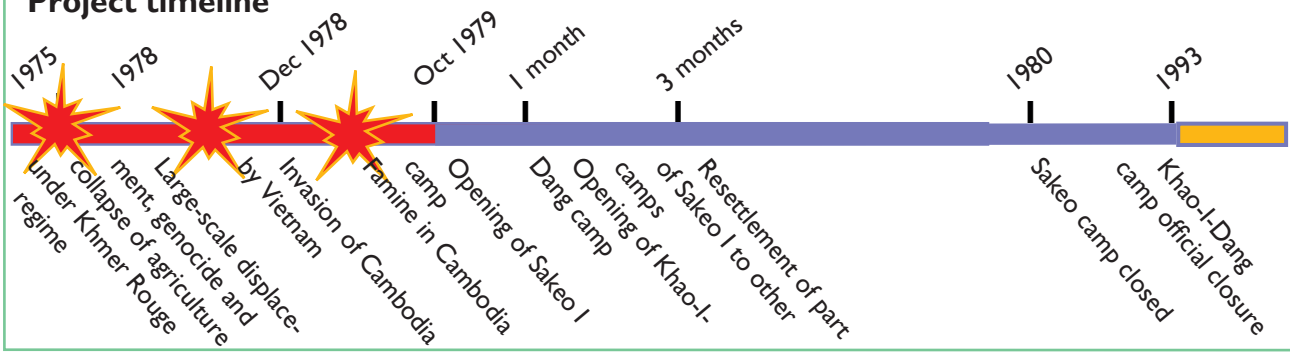
Occupancy rate on handover:
100%

Shelter size
16m^2 (in multi-family units)

Summary

For the first time, clear numeric standards were introduced via the distribution of an operations policy and standards manual to each camp to ensure equitable minimum services, based primarily on public health and water/sanitation concerns. Two camps were planned according to these standards, using a decentralisation of services, and in later cases a 'checkerboard' design that provided internal space for some expansion.

Project timeline



Strengths and weaknesses

✓ Creating a written manual provided a clear checklist for the many organisations with limited prior experience.
✓ Spaces for expansion within the camp permitted some release of pressure from increasing population levels.
✓ Advocacy of an incremental approach to shelter provision allowed for a response to continued influxes and increasing camp populations.
✓ Innovations in water/sanitary 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.
× An overall lack of space and poor drainage contributed to health problems.

Case study credits: Cuny Center

Before the opening of the camp

The invasion of Cambodia by Vietnamese forces in December 1978, the escalation of fighting between Vietnamese and Khmer Rouge forces after June 1979 and famine in October 1979, caused a mass influx of refugees across the border into Thailand, peaking at approximately 1 million people in late 1979 and early 1980.

The Thai government was initially reluctant to host the refugees. After early incidents where 40,000 refugees were returned to Cambodia, the Thai authorities agreed to permit camps in nine locations in the border area. However, they insisted on close control of access and the delivery of services to the camps, and on the basic and supposedly temporary nature of those camps.

The refugee population had been severely traumatised by four years of forced displacement, genocide, famine and armed invasion.

Of the nine camps, eight were internally controlled directly by the Khmer Rouge army or its affiliates. The camp at Khao-I-Dang, however, was the only one under clear Thai government authority, administered by the UN. Leaders of the refugee groups presented themselves to the camp administration at the opening of the camp.

Due to the size, speed and high-profile nature of the emergency, the UN had to cope with a rapid expansion of its own staff and the arrival of large numbers of NGOs, many without prior experience in the field. Because of the variability of the experience of the UN and NGO staff, a consultancy firm was hired to develop a manual of standards. Many of those policies and standards were implemented at the Khao-I-Dang and Sakeo camps.

After the opening of the camp

Both camps opened in October-November 1979 and quickly filled to capacity. Khao-I-Dang camp was initially intended to be temporary, housing people who would be then transferred to other camps, repatriated, or resettled in other countries. The camp also became a collection point for those who had been injured during the conflict.

Despite the later population reduction of the Khao-I-Dang camp, the initial increases in population had posed severe challenges for control of the camps. Overcrowding and the high-turnover nature of camp residents caused the camp to descend into violence and to become extremely difficult to govern at times.

Selection of beneficiaries

The mass numbers of the influx and the political pressures exerted by the Thai authorities and the Khmer Rouge did not permit beneficiary selection upon arrival. Resettlement programmes and transfers influenced the selection of who later left the camp.

Land rights / ownership

Thai authorities designated the camp site and the camp administration assigned individual plots to refugees. All rights of occupancy were understood to be non-permanent. When all the camps closed 1993, repatriation was supported through UN-backed programmes aiming for land grants and providing legal advice.

Standards manual

A policy and standards implementation manual was drafted for the UN by consultants during the last months of 1979 and published in draft binder form by January 1980. The camp sites and services part of the manual had eight initial parts focused on water and sanitation issues, and one part on housing and construction. It emphasised minimum numeric standards, along with clearly defined job roles and responsibilities within the camp.

Implementing agencies in the camp were to be held accountable to these standards through routine assessments undertaken by the UN. The stated goals for the manual were:

- To ensure that all services meet a basic minimal level of quality;
- To ensure that all services are provided in a uniform manner;
- To provide the basic information necessary to successfully implement UNHCR standards;
- To standardise routines and to facilitate reporting and monitoring;
- To provide a guide for those who have had no prior experience in the field; and
- To ensure that the mistakes of previous relief operations were not repeated.

Through regional workshops with the consultant and others in 1980, this manual formed the starting point for the first draft of the UNHCR *Handbook for Emergencies*.

Because of the lack of space, the shelters were constructed as multi-family longhouses, using mainly traditional materials (bamboo and thatch). Fire-retardant wallboard was used for the sides of the longhouses and for the internal divisions between individual families. However, this did not remove problems caused by lack of privacy or communicable disease.

For the most part, the larger longhouses in Khao-I-Dang were laid out in parallel. Some reduction of space was achieved through a 'checkerboard' layout, with blocks of open space throughout the camp. This also allowed for additional shelters, if required. In the Sakeo extensions, the longhouses were grouped into four to eight houses around small internal squares. These were intended as private outdoor space or vegetable gardens for each grouping of refugees. Later shelters were also improved by building them on stilts, to avoid flooding during the rainy season.

Implementation

The organisation assigned a number of NGOs to undertake the different phases of camp construction, upgrading and maintenance, using the manual as a general guide. The refugees themselves were responsible for the construction of their own shelters.

Logistics and materials

The basic materials were provided to the refugees by the humanitarian organisations.

Materials list

The following is a partial list of the materials used for the multi-unit shelters.

Materials
Bamboo poles
Plastic sheeting
Rope or wire
Thatch (palm)
Fire-resistant wallboards
Timber flooring

D.8 Tonga - 1982 - Cyclone Isaac

Case study: Disaster mitigation

Project type:
Quick Impact Projects
Shelter disaster mitigation

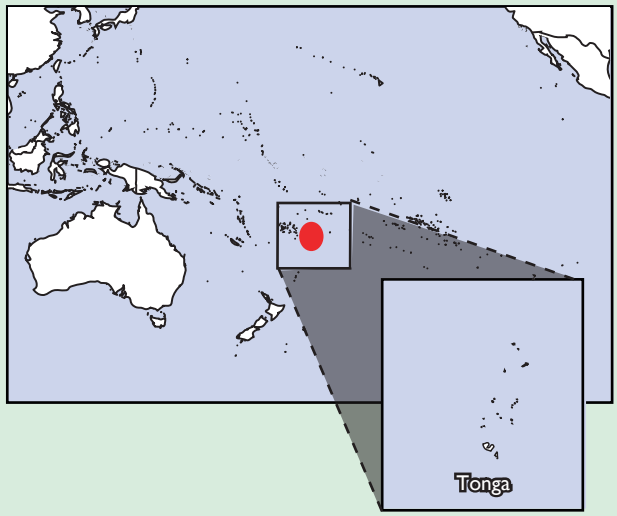
Disaster:
Cyclone Isaac, 3 March 1982

No. of people displaced:
45,000 made homeless

Project target population:
6,600 people in 34 villages for Small Projects programme; 95,000 people (entire population) for disaster mitigation/preparedness programme

Occupancy rate on handover:
Unknown

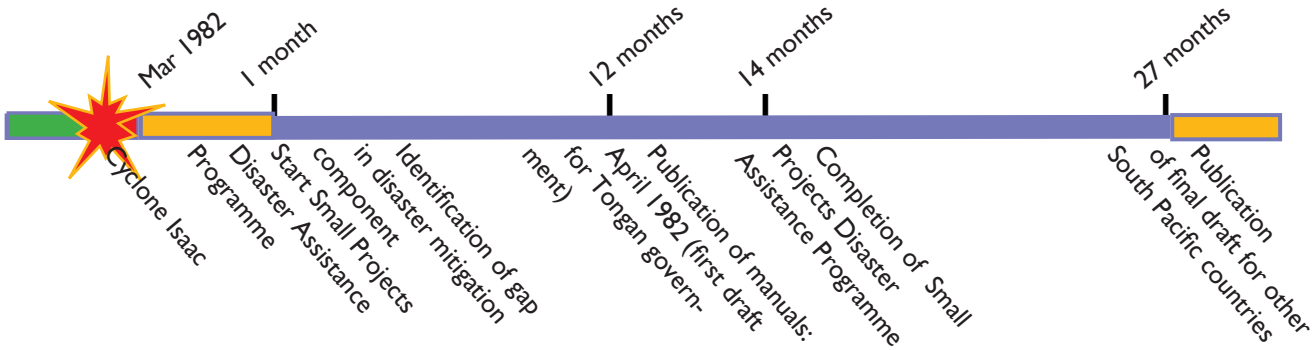
Shelter size:
Various



Summary

The settlement-focused 'Quick Impact Projects' gave responsibility and control to beneficiary villages. A parallel programme on disaster mitigation strategy offered the technical tools to ensure that the awareness of how to 'build back safer' would be incorporated into projects.

Project timeline



Strengths and weaknesses

✓ Communal projects supported recovery on a settlement-wide basis.
✓ Beneficiary-led proposals allowed a wide range of different projects to take place, all tailored to each village's needs.
✓ Disaster mitigation measures were designed to be incorporated into the quick-repeat cycle of disasters, as both preparation and response at the same time.
✓ Using simple techniques and local materials increased the likelihood of acceptance by the affected populations.
× Lack of technical support left questions about the hazard-resistant quality of the Small Projects.
× There is a lack of clarity as to what extent the recommendations of the strategy were followed through.

Case study credits: Cuny Center

Before the cyclone

Tonga consists of 170 islands, 36 of which are inhabited. Approximately two-thirds of its population of 95,000 people live on one main island group.

Tonga is exposed to a number of hazards (earthquakes, volcanic eruption and tsunamis) of which cyclones are the most common, striking once every 1.6 years on average. Cyclone Isaac was declared by the Tongan authorities to have been the worst disaster in Tongan history, in part because of the magnitude of the destruction of housing, public buildings and livestock (95% of livestock were killed in some places), but also because of the proportion of damage caused to the more heavily populated island of the capital city, Tongatapu.

The emergency response was constrained by the large number of islands, the dispersed nature of the population and limited communications. It emerged after the cyclone that there had been no comprehensive government disaster mitigation or disaster response programme in place.

Repeated cycles of disaster and short-term emergency response had contributed to a lack of disaster-preparedness and disaster-mitigation planning. The repeated disasters had both forced resources to be used for emergency response and had damaged the local population's capacity for self-reliance.

Public buildings were designed using seismic and cyclone codes from Australia and New Zealand, but these were not applied to private housing. The modernisation of some of the housing stock in the prior decade had also seen many houses built with badly secured metal roofing sheets.

After the cyclone

Relief agencies and the armed forces of Australia, New Zealand and other countries worked quickly to bring food supplies, medicine and other support to the affected population. The largest immediate concern was the widespread destruction of livestock and crops. While 1,000 tents and tarpaulins were delivered in the first few days, many families had already started the rebuilding process.

Small Projects

The implementing organisation, in cooperation with the Government of Tonga and a major international donor, started their programme three weeks after the cyclone. The project was intended as a form of 'Quick Impact Project'. It was called the Small Projects Disaster Assistance Programme and had a shelter and settlements focus.

The uneven speed of progress in the completion of some projects meant that the programme did not finish until the end of June the following year. The Small Projects programme was already on the ground before the emergency. The consultants employed to create a shelter strategy were also involved in a broader project of disaster mitigation for housing in the South Pacific.

Disaster mitigation strategy

For some time prior to Cyclone Isaac, the same international donor had also been funding the first stages of a shelter-focused disaster preparedness study for all of the anglophone South Pacific islands. Parts of the study specific to Tonga were then written in direct reference to the cyclone and a draft was released in April 1982. This then informed studies for the other islands. The consultant continued to work with the same donor and with research organisations until 1984 to produce guidelines for other South Pacific countries.

Selection of beneficiaries

Small Projects The size of many small islands and the prior stationing of the implementing organisation's staff allowed information about the Small Projects programme to be delivered to each community by word of mouth. Villages made proposals as a whole and each village's proposal was assessed by the implementing organisation. The national government was informed of all decisions. A number of field visits to each village were made during the projects to monitor for quality and speed of progress.

While it was designed primarily for the Government of Tonga, the strategy for disaster mitigation and preparedness was also intended to be accessible to the country's entire population.

Land rights / ownership

For the most part, beneficiaries built back on their customary land.

Technical solutions

The villages were left to decide whether there were any proposals for which they would like to apply for funding. Staff worked with the villages to prepare the actual technical proposals.

Responsibility for all construction and for the construction quality of the Small Projects was left explicitly to the beneficiaries.

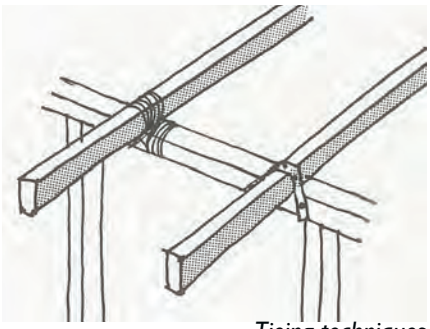
Because most villagers were able to quickly build basic shelters, and because they were applying as a village, the proposals were often for communal facilities in the village, or groups of structures that benefited the shelter and settlement recovery as a whole. These included restorations of village fences, showers, kitchens and toilets, as well as community food gardens. Other projects, not directly related to shelter, included the restoration of poultry units, water tanks and a wind tower.

Disaster mitigation strategy

The consultant realised that most traditional houses were built and maintained incrementally by the families. Outside support, whether it was materials or information, often arrived while the recovery and reconstruction process was already underway. The fact that this process was often ongoing when Tonga was faced with the next disaster led the consultant to develop a series of illustrated information booklets that advocated:

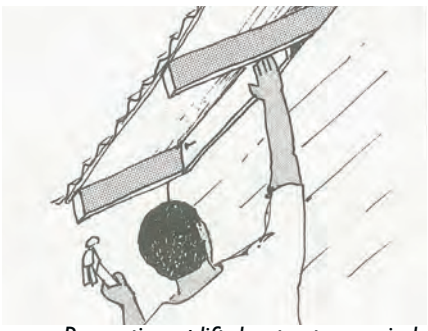
- self-reliance and self-build techniques for the affected families;
- use of traditional techniques and locally available materials;
- last-minute strengthening measures applicable to both transitional and permanent housing; and
- the incorporation of hazard-resistant measures into the repair of disaster-damaged housing, as few houses were torn down and built anew from scratch.

The guidelines had to take into account the wide range of hazards that were possible in Tonga. The main guidelines concerned strengthening

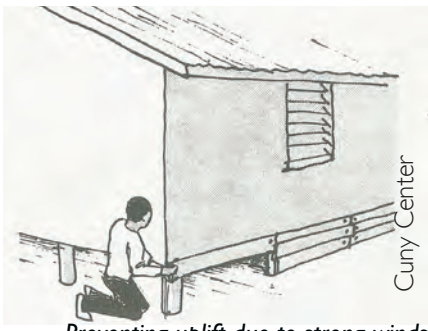


Tieing techniques

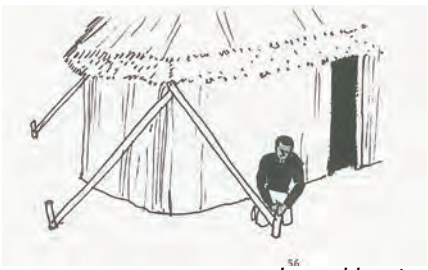
Bracing techniques



Preventing uplift due to strong winds



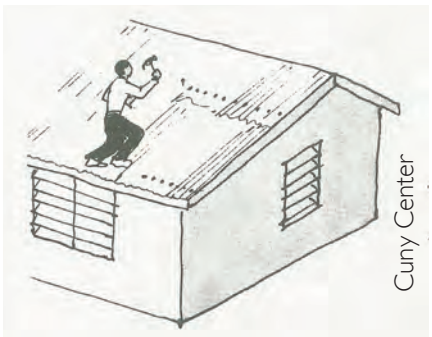
Preventing uplift due to strong winds



Lateral bracing

Wind resistance techniques

Safe wall cladding fixture



Safe roof fixture

against both cyclones and earthquakes, focusing on the binding of roofs to wall posts and the binding of ring beams and reinforcement of joints.

The guidelines included the planting of bushes in front of houses to protect them from objects blown by high winds. The most important element was the realisation that post-disaster mitigation measures would be implemented both before and after repeating disasters, as part of a cycle of reducing damage, repair and upgrading.

The graphics guidelines were also accompanied by other documents that focused on the setting up of permanent disaster preparedness capabilities within government structures.

Implementation - Small Projects

Proposals for each project were received on a rolling basis; approval took about three weeks in each case. The site was visited and the proposal was checked to ensure that it answered a cyclone-related problem, was within a maximum of US$ 5000 and met other criteria.

A clear agreement on the division of responsibilities was drawn up between the organisation and the village. The organisation was to procure the materials, while the village would pick up the materials from the local depot and would take responsibility for construction.

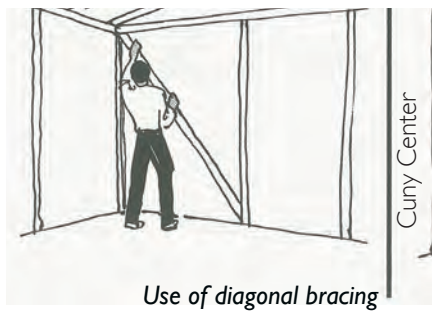
One challenge involved ensuring that the villages understood what the materials would be used for. This issue became more central in villages where the leadership structures were not clear.

Disaster mitigation strategy The studies and the illustrated guidelines were made available to the Tongan government. Other consultants developed similar illustrated guidelines that were published as supplements in a local newspaper.

Logistics and materials

Small Projects In some of the small projects, the NGO was able to ask a village to show how much construction material they already had and were willing to use in the project. The resulting project budget was then used to meet the shortfall.

In some projects the implementing organisation was not able to survey the available construction resources beforehand and they therefore made a more comprehensive budget. Some materials (e.g. timber, thatch) could be sourced locally, but many other materials had to be brought to the different islands, making projects longer to implement. The implementing organisation was able to buy scarce materials duty free at the government store, which saved an estimated 27% in costs.



Use of diagonal bracing

D.9 Sudan - 1985 - Conflict

Case study: Planned camps

Project type:
Planned camps

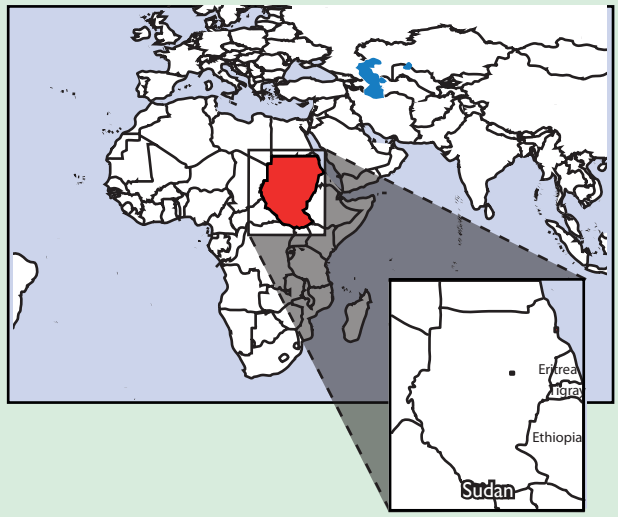
Disaster:
Civil war and famine in Ethiopia (Eritrea and Tigray) 1983-1984

No. of people displaced:
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

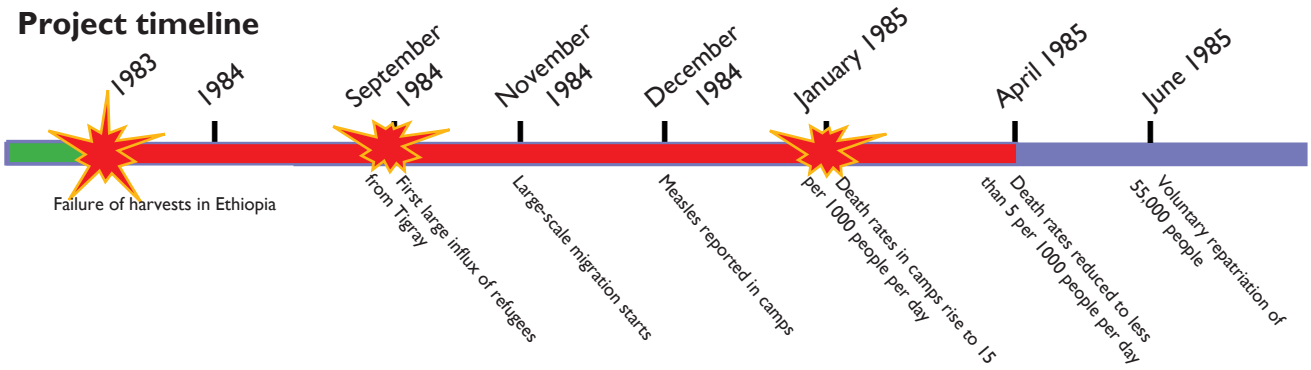
Shelter size:
Various



Summary

Relocating refugees from smaller camps gave time to create better sites and facilities in the larger camps built as part of the second stage. Building camps using a hierarchy of shelter groupings (cluster-block-sector) helped the humanitarian actors ensure support for the cycle of repatriation.

Project timeline



Strengths and weaknesses

✓ Working with local relief agencies allowed camp planners to understand village and community structures, and to adapt camp layouts to those structures accordingly.

✓ Having clearly demarcated sections and blocks in a camp facilitated both repatriation and phased reuse of the camp for newcomers.

✓ Decentralisation of services in the camp allowed for easier training of village health workers in preparation for repatriation.

× Multi-sectoral guidelines on camp planning and camp management had been available for a number of years, but were insufficiently known among many implementing organisations.

× Unplanned camps not only had problems with water supply, but some then had health-threatening problems with drainage once the rains arrived.

× Relocation to new camps, while unavoidable, had large programme costs.

× Not even advanced camp layouts can solve the grave issues of malnutrition or communicable disease.

Case study credits: Cuny Center

Before the influx

There had been ongoing conflict between the Ethiopian government and rebel groups fighting for independence for the provinces of Eritrea and Tigray since the 1970s. Many refugees from the conflict moved to Sudan. During 1983-1984, the conflict combined with drought across many countries in Africa to create a major famine. There were no early warning programmes or adequate stockpiles until after September 1984.

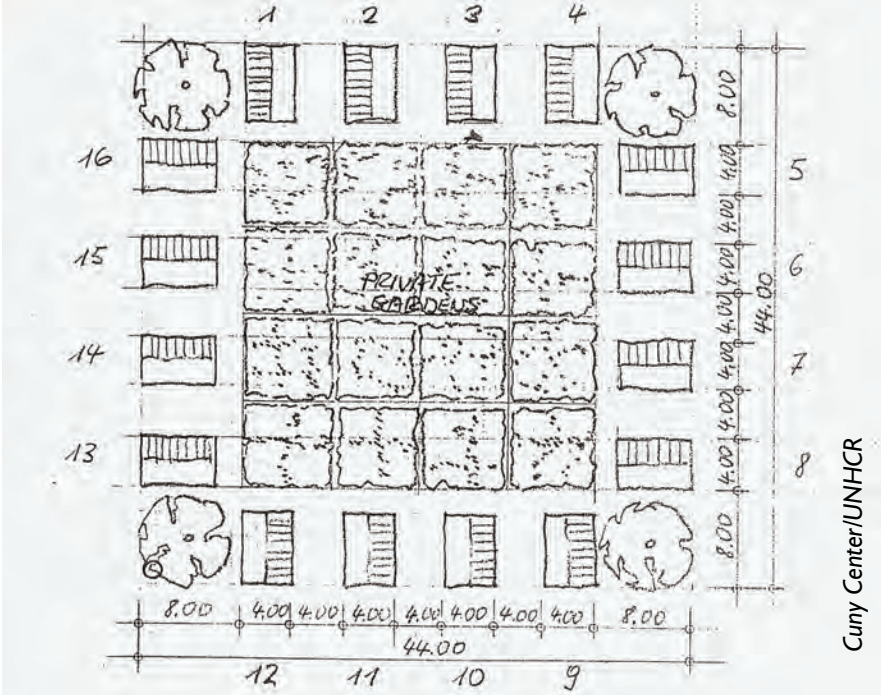
Before 1984, sufficient food had been supplied into Tigray from Sudan. By mid-1984 the Relief Society of Tigray, a national civil relief organisation, stated that the famine had reached crisis levels and that they would lead Tigrayans out of Tigray and into Sudan, where they could receive aid.

Initial camps in Sudan were sometimes located adjacent to the sites of older permanent refugee settlements. In early December 1984, it was realised that there were not enough water resources for these camps. A decision was taken to look for sites that would support larger numbers of refugees. Even then, not all camps had adequate clean water for many months. Waterborne disease, alongside measles and malnutrition in new arrivals, became the chief cause of death in the camps.

Although the Sudanese had welcomed hundreds of thousands of refugees for resettlement from Ethiopia over the previous two decades, the scale of the new influxes, and the fact that Sudan itself was suffering a drought, caused a reversal of policy in the Sudanese government. Even when this decision was overturned, the government indicated that they did not expect the refugees to remain in the long term.

After the first influx

NGOs began searching for suitable sites for new camps. Between April and June 1985, 55,000 refugees were able to return to Ethiopia. But this still left 258,000 new Ethiopian refugees in eastern Sudan, in addition to 120,000 Chadian refugees in the west of the country, 700,000 'old' Ethiopian refugees and increasing numbers of internally displaced Sudanese.



Block plan

Selection of beneficiaries

There was no selection per se. As the refugees arrived in the camps in more or less intact village groups, it was possible to work with the village leaders and social structures to identify vulnerable members.

Land rights / ownership

There were no permanent land rights given to refugees. In fact, the government of Sudan insisted that new refugees would not be granted permanent residency.

Technical solutions

Once decisions had been made to transfer some of the refugees from inadequate camps, the new camps were set up following a hierarchy of blocks of buildings. This started with a cluster of shelters based on the size of each extended family. These clusters could be grouped together to form a block that would follow the size of a single village. A number of blocks would form a sector of a camp.

Importantly, the number of clusters in a block was not predetermined, but was dependent upon the number of extended families coming from each village in Tigray. To the extent possible, services such as health units and supplementary feeding centres were decentralised throughout the camps. Space was left in each block for late arrivals from each village.

This cluster, block and sector hierarchy was derived from the *Handbook for Emergencies*, which had been made available two years before the crisis. A Sudan-specific version of the handbook specific was created.

As the main emphasis was placed on water supply, sanitation and the logistics of food and medicine, the basic shelter was often a traditional tukul tent made out of branches, although there were some distributions of other shelter materials. The government's insistence that the camps were to be short term often prevented the use of any more durable shelter materials, even if the resources had been available.

Implementation

The Relief Society of Tigray would often lead the Tigrayans into Sudan in entire village groups. In some cases, the society would also participate in the transfer of groups from one of the first camps to a second camp with better facilities.

Materials

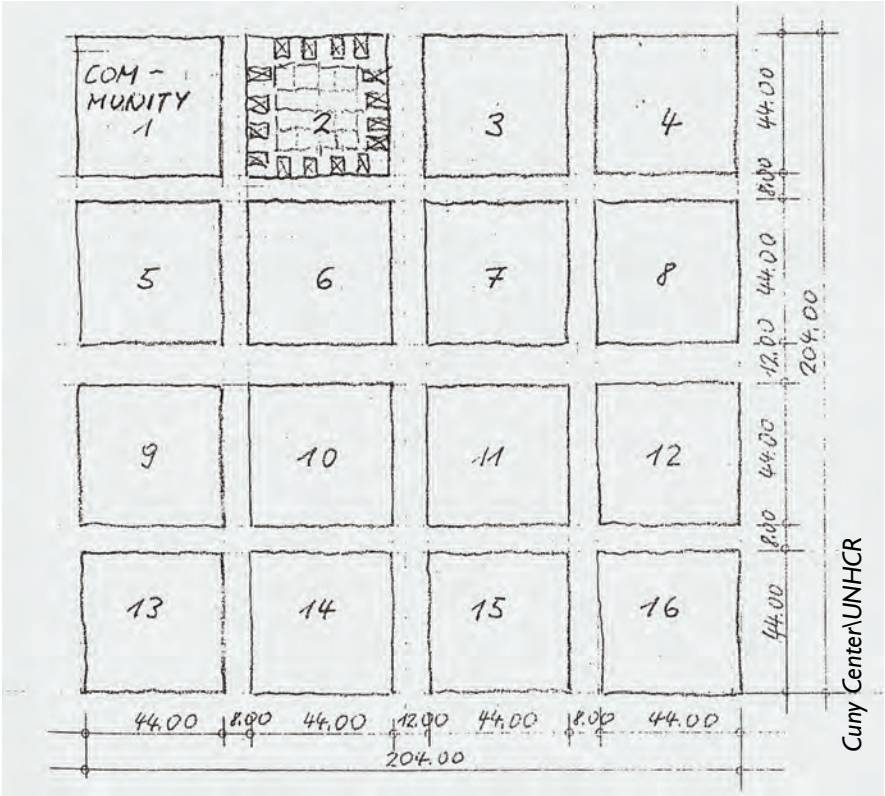
Pressure from the Government of Sudan meant that use of any 'permanent' materials was avoided. Although there were distributions of plastic sheeting, many of the refugees

lived in self-built tukul tents, made from tree branches, grass thatch and cloth.

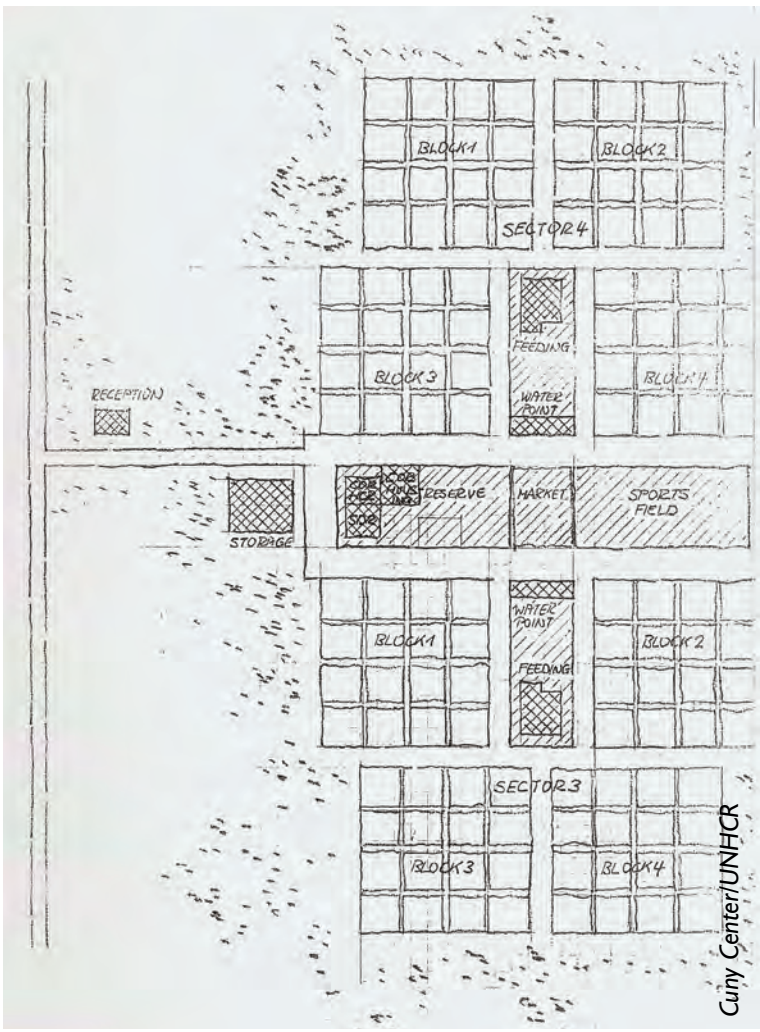
Logistics

Access to the camp helped with logistics. The most important paved highway in Sudan, connecting Port Sudan with Khartoum, ran through the camps areas. A major train line also ran adjacent to the highway for part of the time, and airports capable of handling large jets or C-130s were available at towns used as logistics hubs.

Most materials had to be imported using UN mechanisms, apart from individual shelter materials scavenged by the refugees. During the emergency, there were some severe delays in the provision of materials, but these were caused by poor pre-planning, lack of stockpiling and internal organisational issues, as much as by lack of physical infrastructure.



Sector plan



Camp plan

'[The design] had several major advantages. First, it enabled the relief agencies to train a cadre of health workers from each village. In the event that people decided to return to Tigray (which many of them did several months after arriving in the camp), the skills and training the workers had acquired would be taken back to the village with them. Second, it provided camp administrators with a simple way to reunite families. When anyone entered Sudan, they simply had to tell the relief authorities what Tigrayan village they were from; they could be transferred to the camp where the people from that village were located. Family reunification could then be handled on a self-help basis. Finally, camp administrators were presented with an intact community organization with which to work, facilitating activities which required notification or organization of the refugees.'- Fred Cuny

Further reading

Key shelter-related documents

Websites

www.humanitarianreform.org
The home page of the project to establish clusters as a coordination mechanism. Includes the Emergency Shelter Cluster and Early Recovery Cluster home pages, which contain further reading on the cluster approach as well as on technical issues.

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.

http://ochaonline.un.org
1. *UNDRO Shelter after disasters*
2. *Transitional settlements*
3. *Guiding Principles on Internally Displaced.*

Corsellis, T. and Vitale, A. (2005). ***Transitional Settlement: Displaced Populations***, Oxfam Publishing, United Kingdom.
Guidelines aimed at strategic planners and implementers of settlement responses. Considers settlement options for displaced populations.
Available online: www.shelterlibrary.org

IFRC/Oxfam (2007). ***Plastic sheeting: A guide to the specification and use of plastic sheeting in humanitarian relief.***
A guide to the use and specification of plastic sheeting in humanitarian operations.
Available online: www.plastic-sheeting.org

Norwegian Refugee Council/The Camp Management Project (2008). ***The Camp Management Toolkit.***
A comprehensive field manual for camp management agencies and stakeholders involved in camp operations.
Available online: www.nrc.no/camp

The Sphere Project (2004). ***The Humanitarian Charter and Minimum Standards in Disaster Response.***
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.
Available online: www.sphereproject.org

UNDRO (now UN/OCHA) (1982). ***Shelter after Disaster: Guidelines for Assistance***.
Guidelines and description of shelter provision in all aspects of natural disasters, from preparedness to reconstruction.
Available online: www.sheltercentre.org (www.reliefweb.int/library/documents/2003/undro-shelter-jul82.htm)

UN/OCHA (2008). ***Transitional Settlement and Reconstruction after Natural Disasters***, field edition.
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.
Available online: www.shelterlibrary.org

UN/OCHA (1998). ***Guiding Principles on Internal Displacement***.
Identifies the rights and guarantees for the protection of internally displaced people. Relevant to forced displacement and protection and assistance during displacement, as well as during return or resettlement and reintegration.
Available online: www.shelterlibrary.org

UNHCR (2007). ***Handbook for Emergencies,*** UNHCR, 3rd ed.
A managers' guide to setting up emergency operations for large-scale influxes. Provides advice on how to tackle various aspects of the emergency response.
Available online: www.unhcr.ch

Despite the hundreds of shelter projects completed around the world every year after conflicts and natural disasters, there are few compilations of case studies and best practices. As a result, an opportunity to consolidate learning from what has gone before has been lost.

This book shares with the humanitarian community over thirty case studies of completed emergency and transitional shelter projects. The project summaries included aim to illustrate some of the shelter project options available to organisations working in both post-disaster and post-conflict situations. The focus of this book is on projects which maximize the use of emergency response funds by paving the way for sustainable recovery.

This document is targeted at:

Programme managers and field shelter programme staff from local, national and international organisations at all experience levels.

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