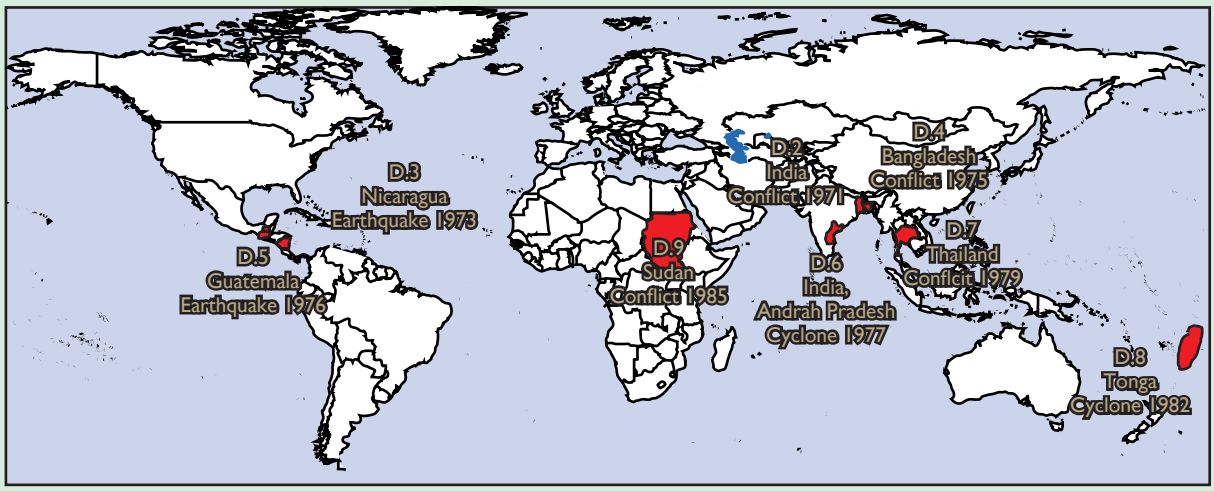
Section D
Historical Case Studies
From the Cuny Archive



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

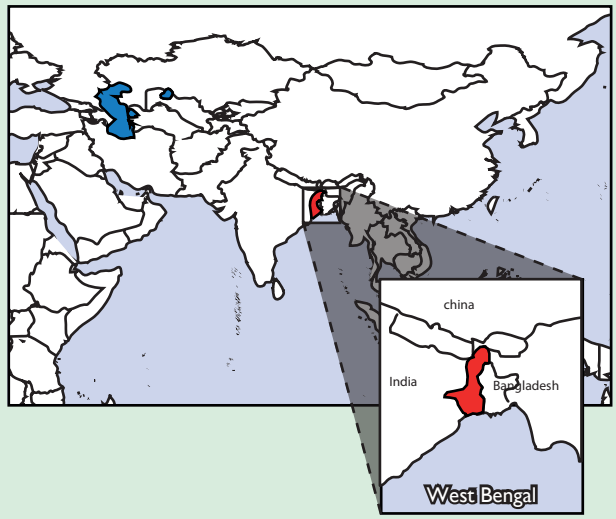
Disaster:
Civil war in Bangladesh (then East Pakistan)

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%

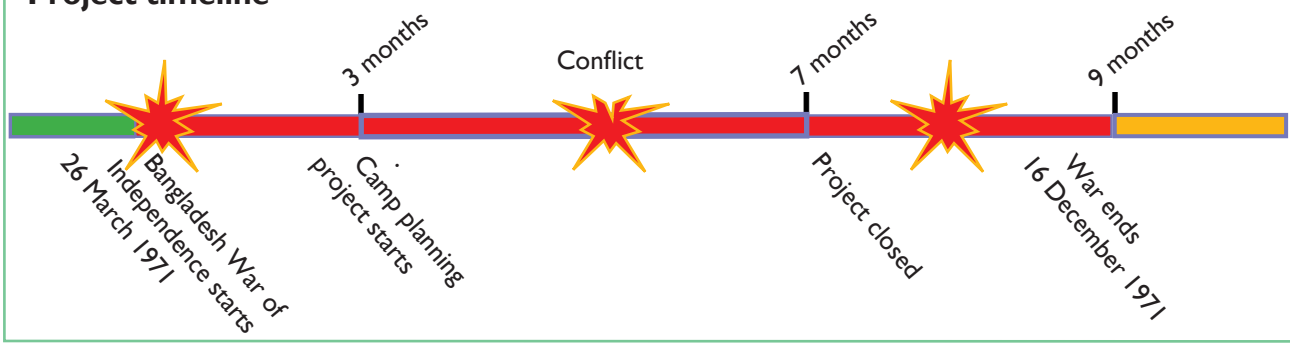
Shelter size
Various



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

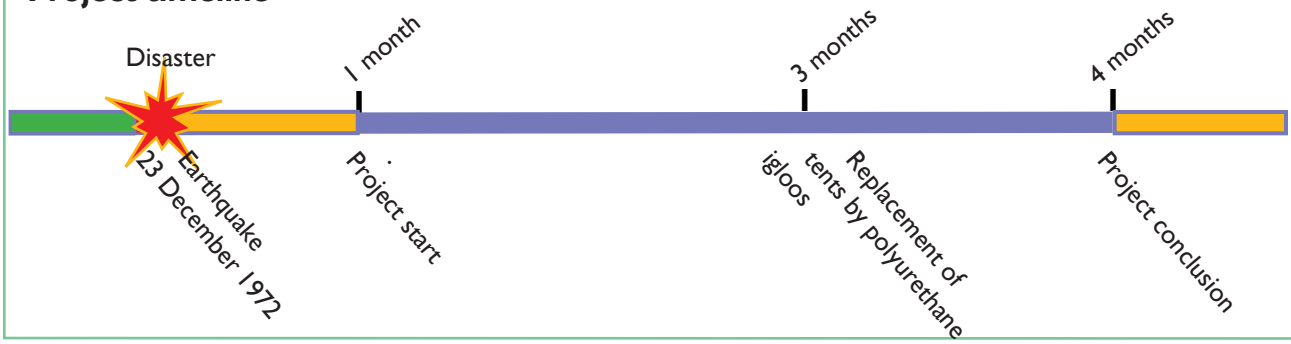
Occupancy rate on handover:
60% of tents; 45% of replacement igloos

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

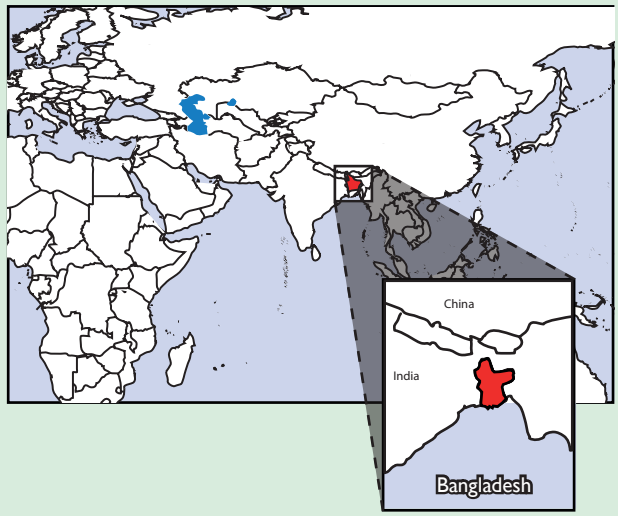
Disaster:
Bangladesh War of Independence, 1971

No. of people displaced:
Hundreds of thousands

Project target population:
Three camps

Occupancy rate on handover:
100%

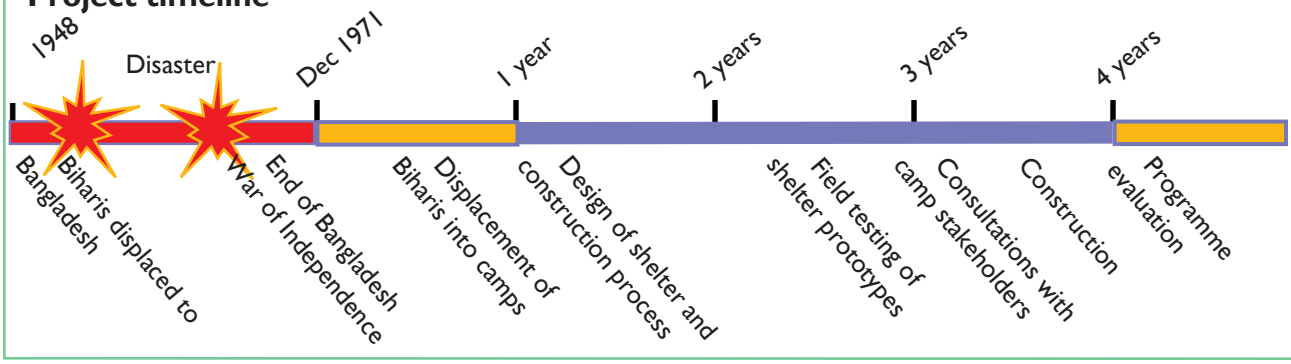
Shelter size
Various



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.

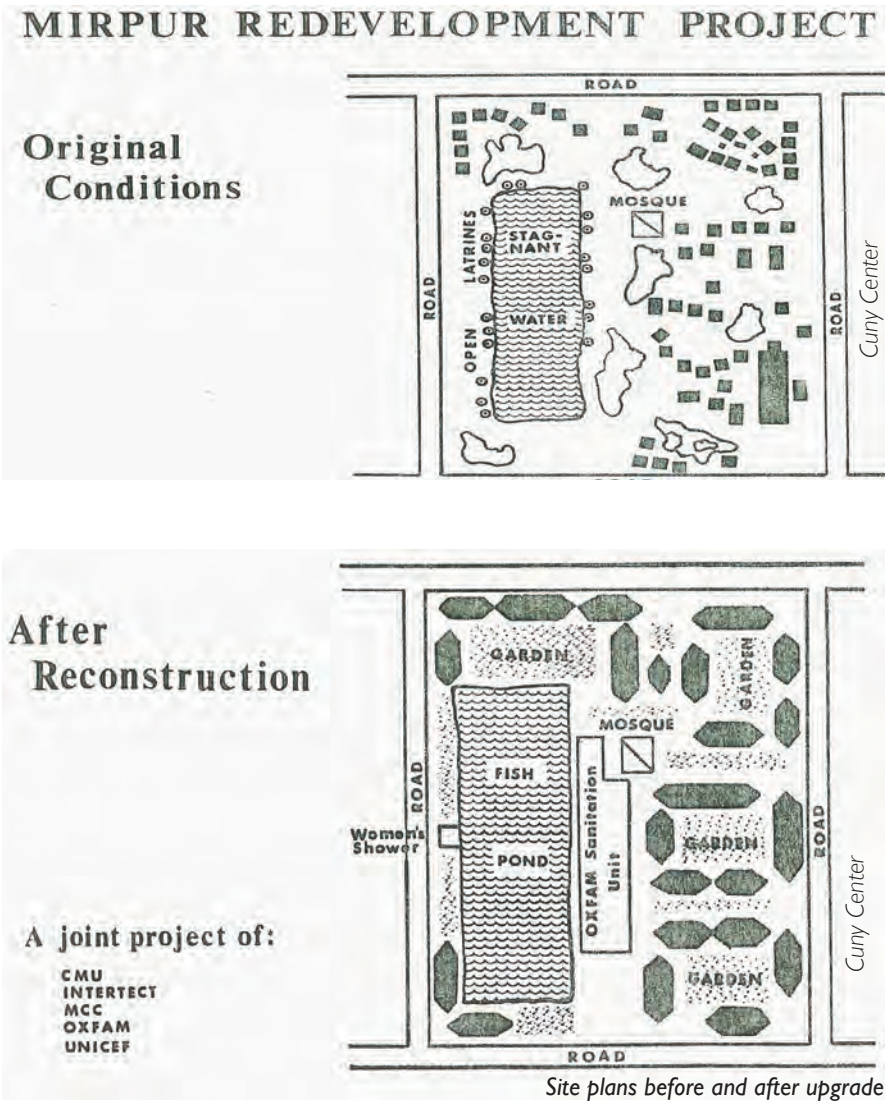
During the 1972-1974 period, the Biharis were displaced into camps, often under force from the Bangladeshi authorities. A number of those camps were scattered on marginal lands on the periphery of Dacca. In 1972, some NGOs had given shelters or shelter materials to the camps, but the camp layouts were 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.

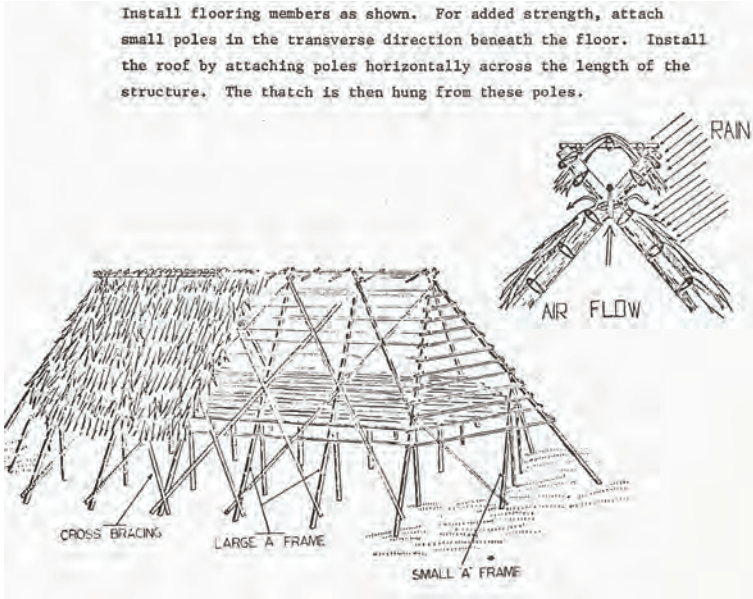
Technical solutions

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.



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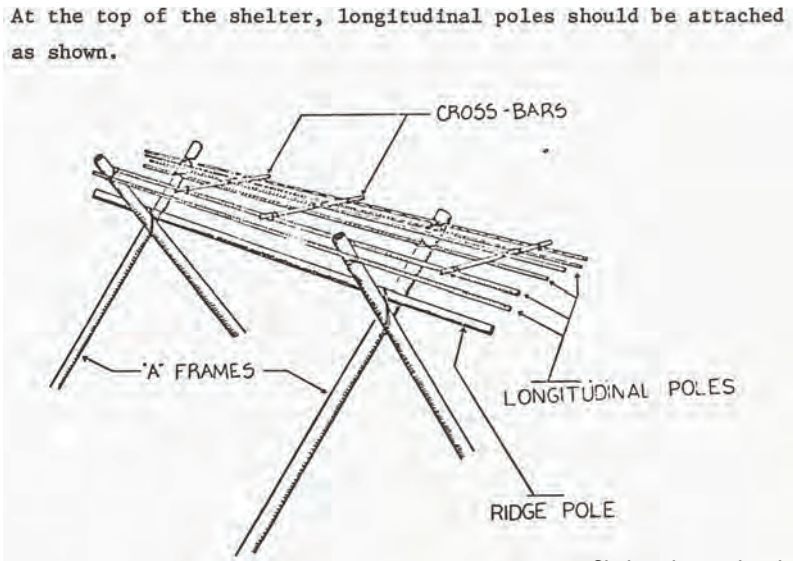

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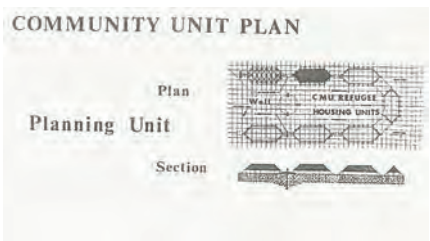
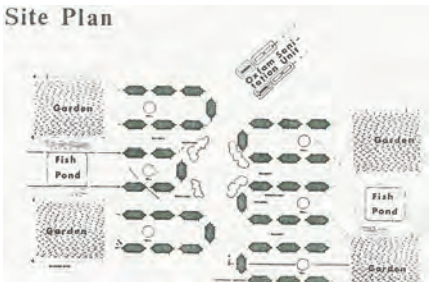
Shelter design details





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

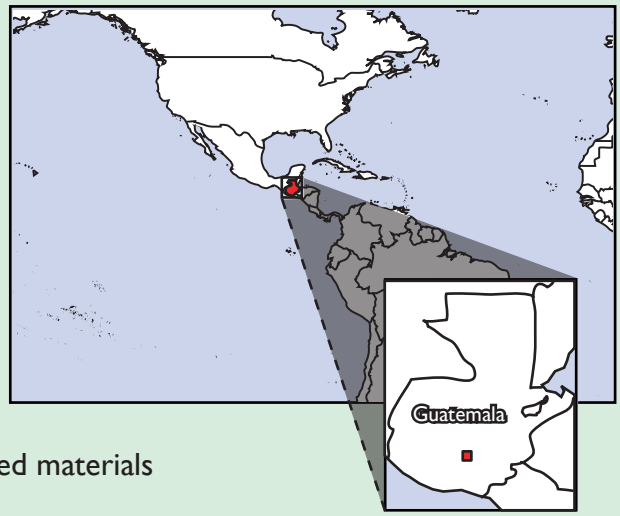
Disaster:
Earthquake in Guatemala

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

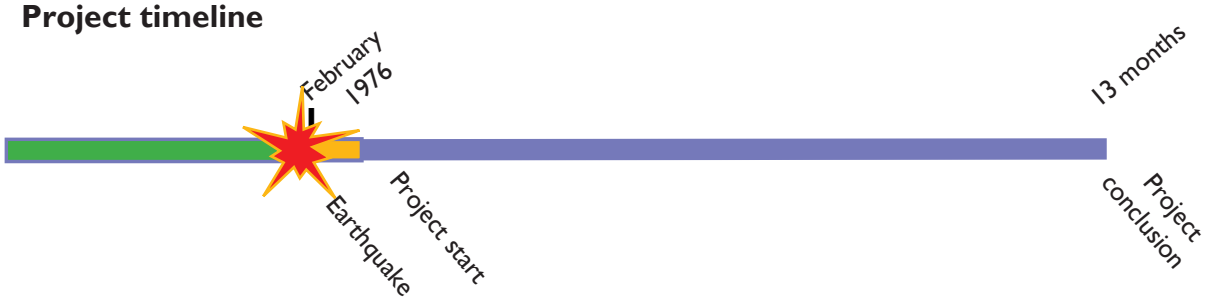
Shelter size
Various



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.

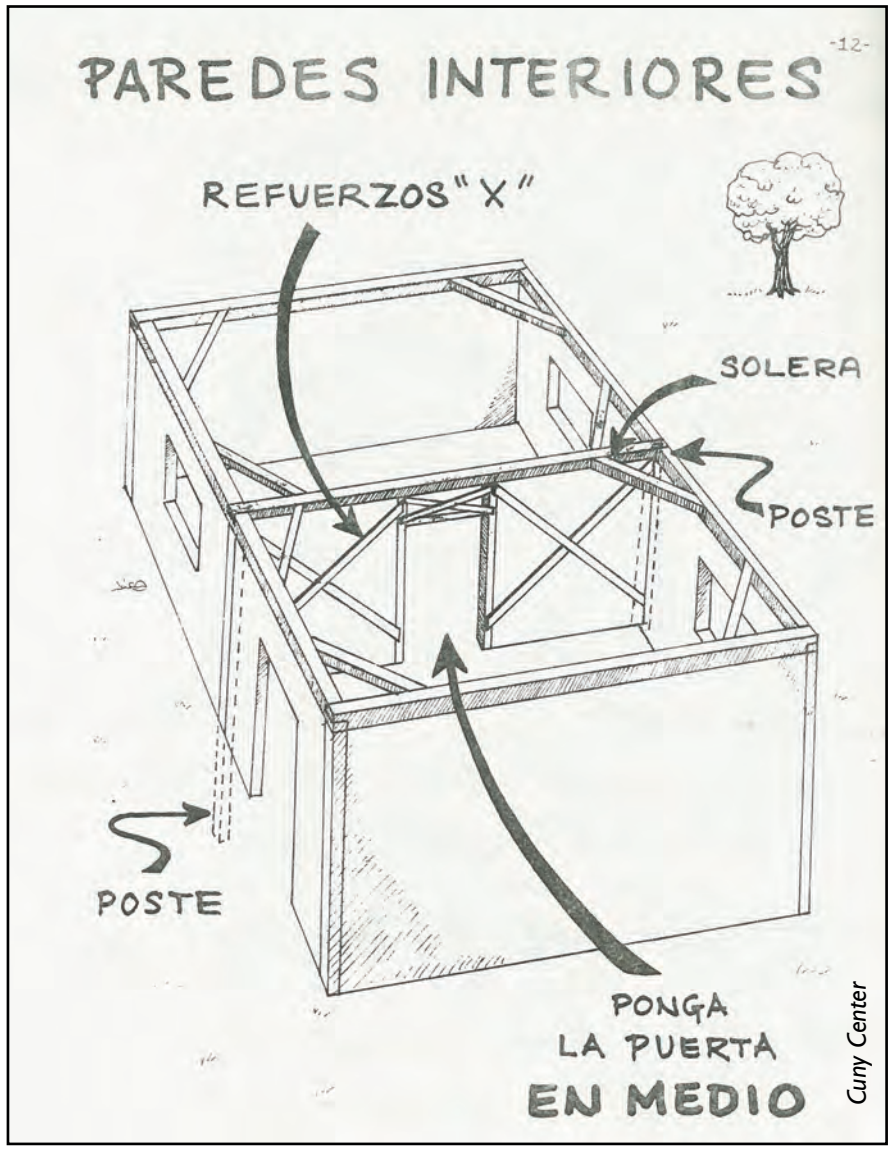
After the earthquake

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

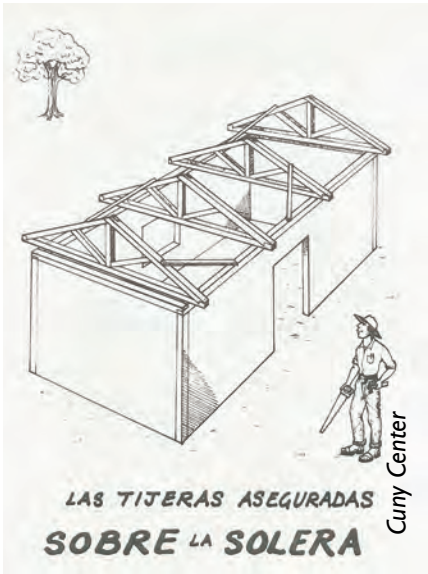
Four affected rural areas were assigned to the NGOs by the national government. A partial registration of beneficiaries was helped by an implementing partner and the fact that local cooperatives were already present in the area. In some areas there were issues of competition for beneficiaries or of beneficiaries 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

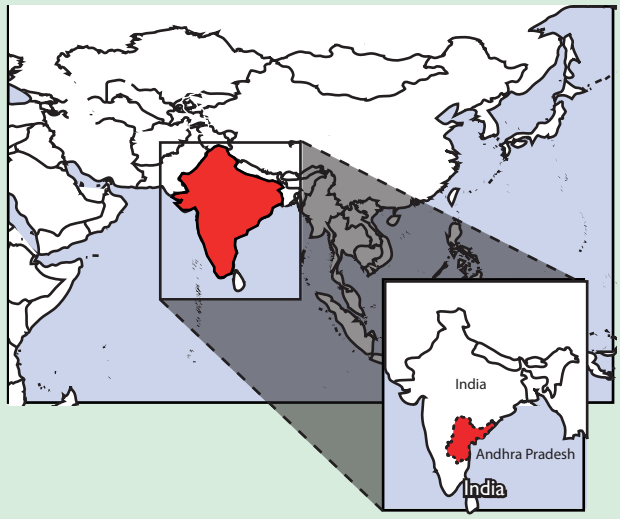
Disaster:
Cyclone in Andhra Pradesh, India

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

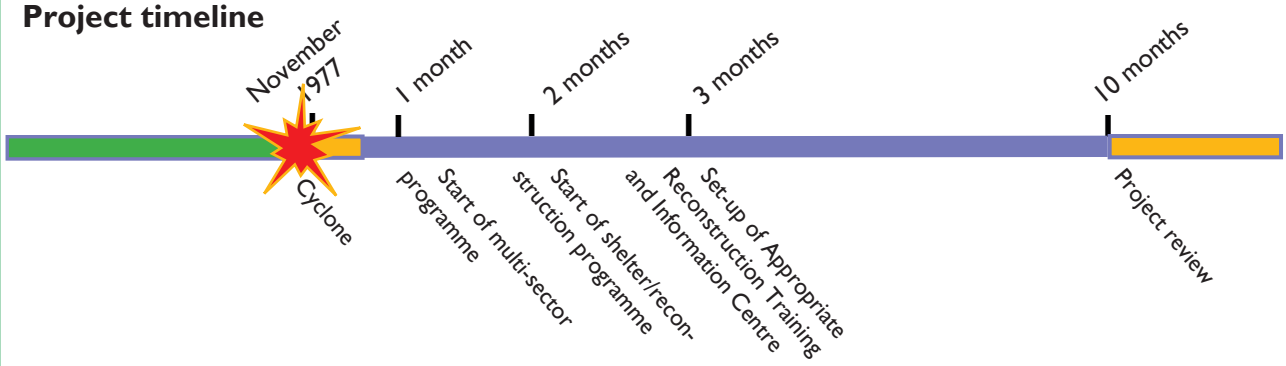
Shelter size
25m² (constructed from distributed materials)



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.

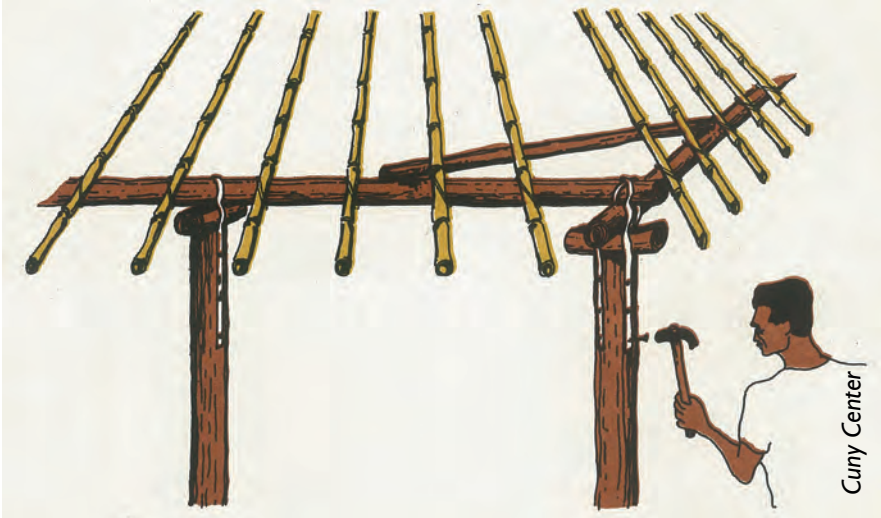
× The promise by some organisations that 'pukka' houses for the beneficiaries would eventually be constructed actually held back the process of recovery in wider ranges of affected communities.

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.

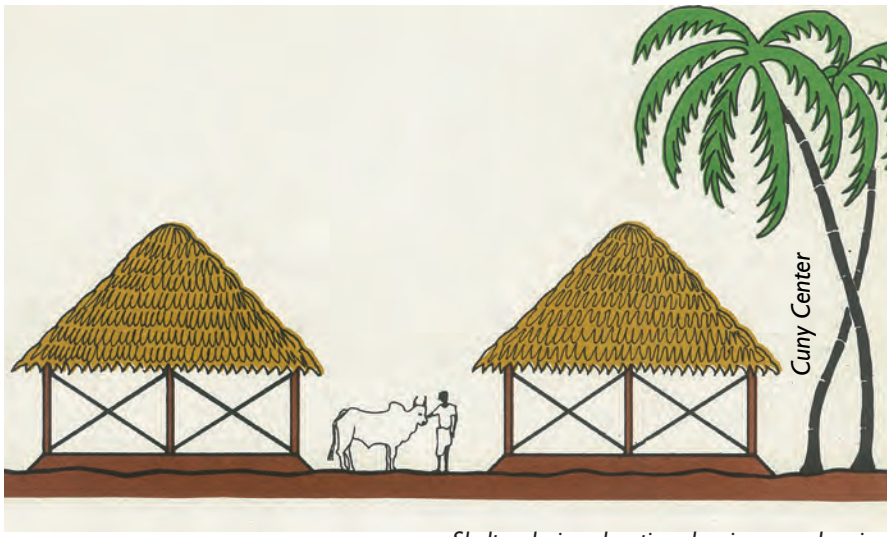
The NGO initially targeted the most vulnerable members of each village for the materials distribution, asking the local Rotary Club to work with the villages to select 20 of the most vulnerable households from each village, according to agreed-upon criteria.

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.

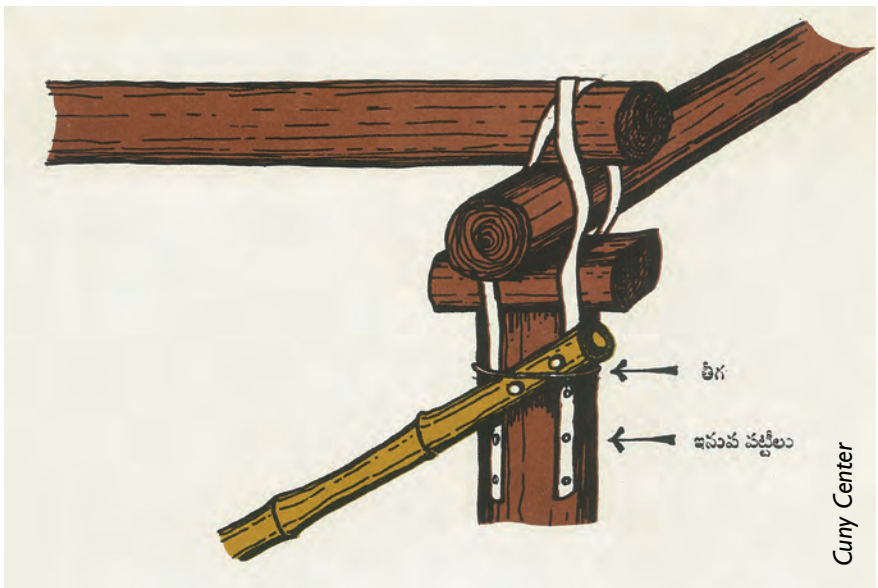


Shelter design elevation showing cross-bracing

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)

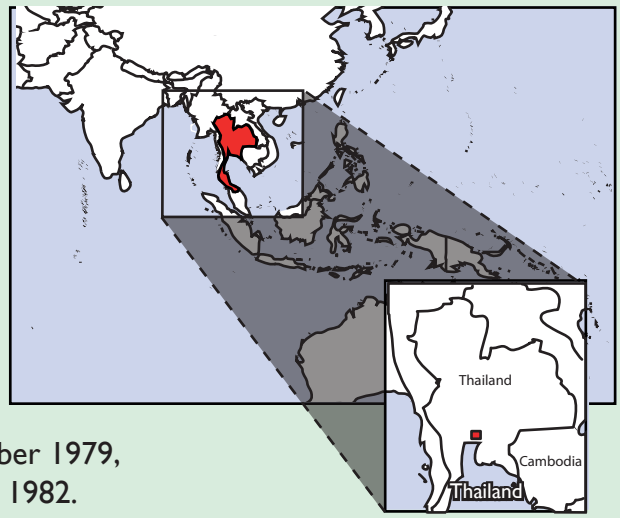
D.7 Thailand - 1979 -1980 - Political conflict

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).

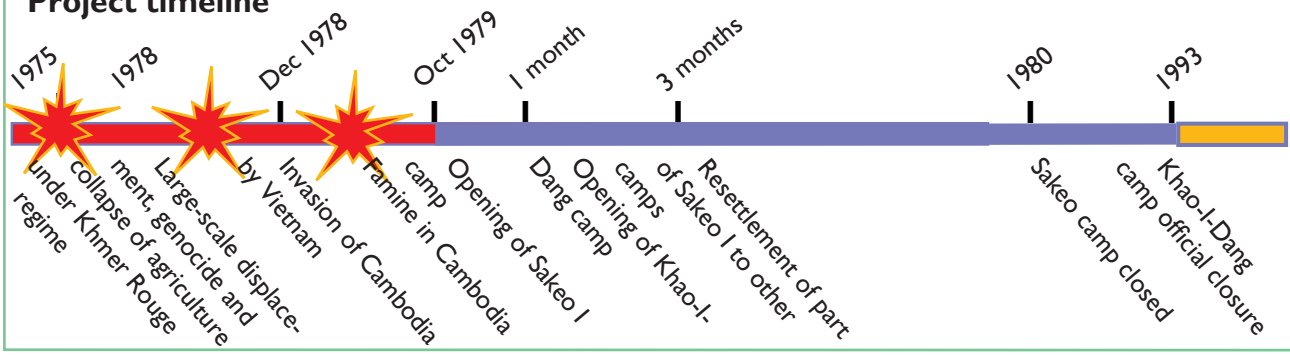
Occupancy rate on handover:
100%

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

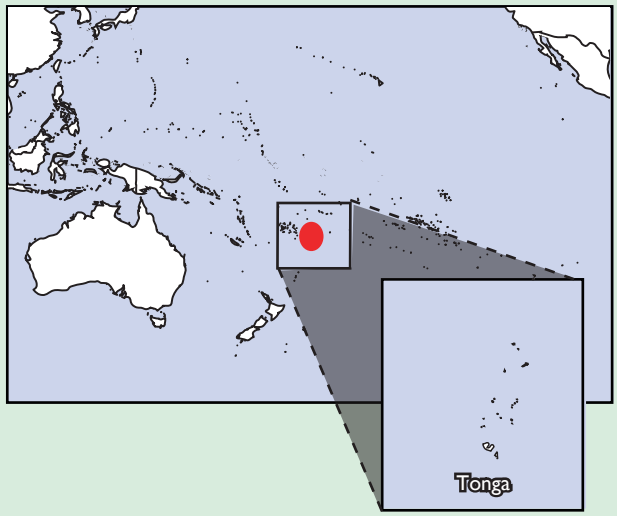
Disaster:
Cyclone Isaac, 3 March 1982

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

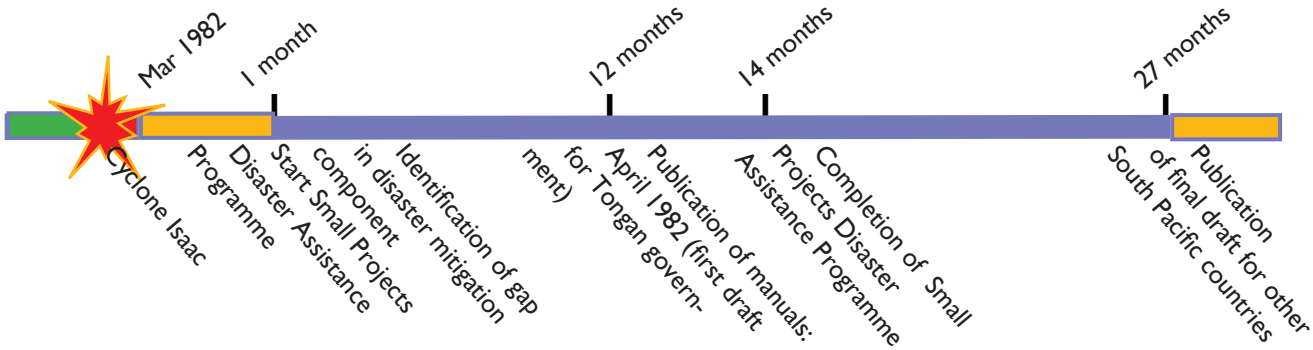
Shelter size:
Various



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.

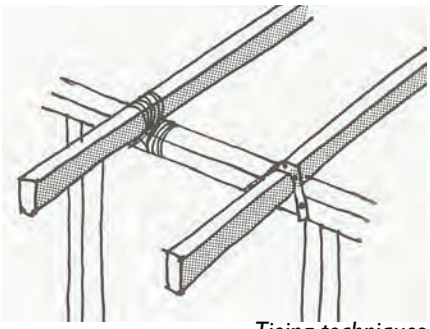
Because most villagers were able to quickly build basic shelters, and because they were applying as a village, the proposals were often for communal facilities in the village, or groups of structures that benefited the shelter and settlement recovery as a whole. These included restorations of village 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:

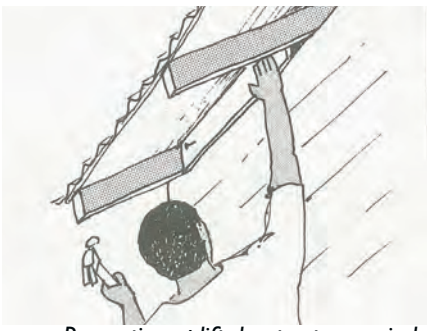
- self-reliance and self-build techniques for the affected families;
- use of traditional techniques and locally available materials;
- last-minute strengthening measures applicable to both transitional and permanent housing; and
- the incorporation of hazard-resistant measures into the repair of disaster-damaged 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

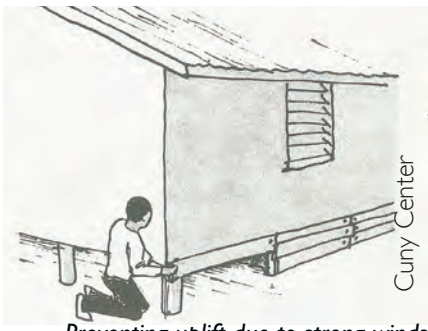


Tieing techniques

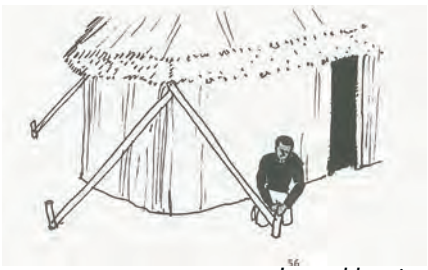
Bracing techniques



Preventing uplift due to strong winds



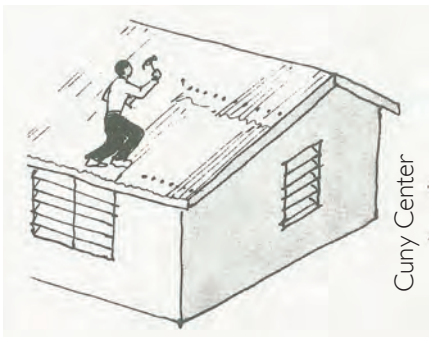
Preventing uplift due to strong winds



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.

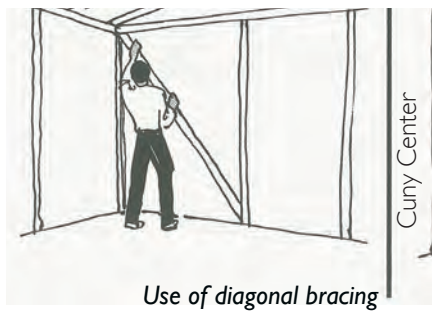
One challenge involved ensuring that the villages understood what the materials would be used for. This issue became more central in villages where the leadership structures were not clear.

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

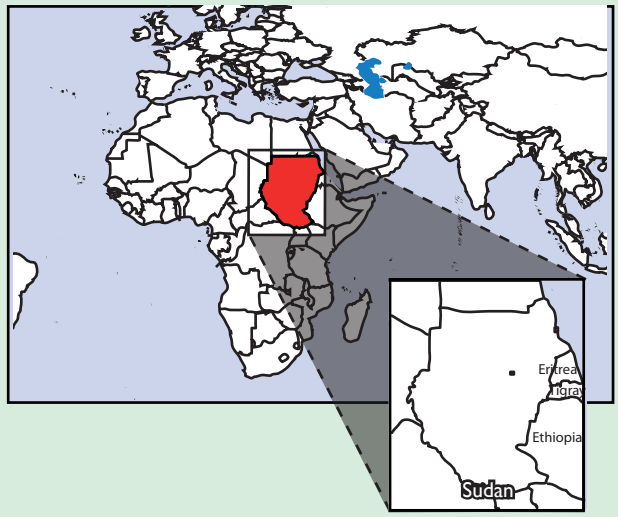
Disaster:
Civil war and famine in Ethiopia (Eritrea and Tigray) 1983-1984

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

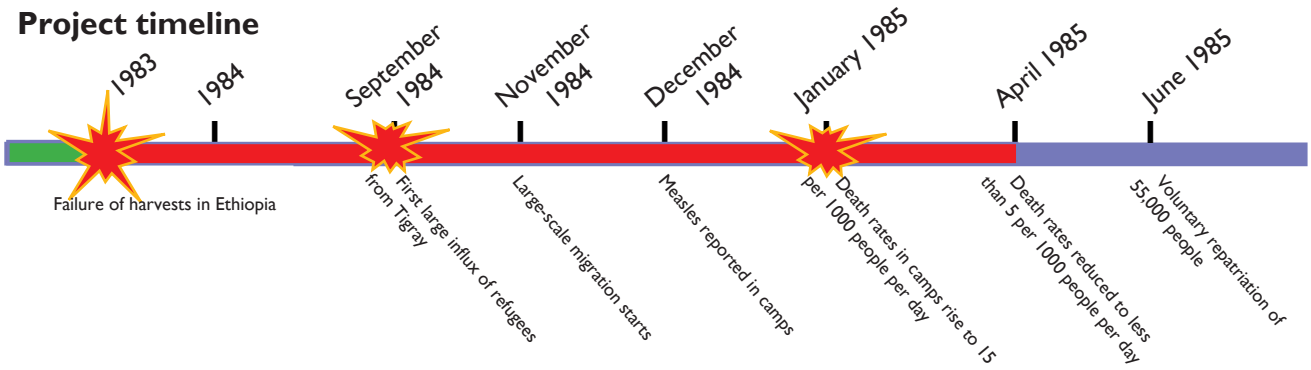
Shelter size:
Various



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.

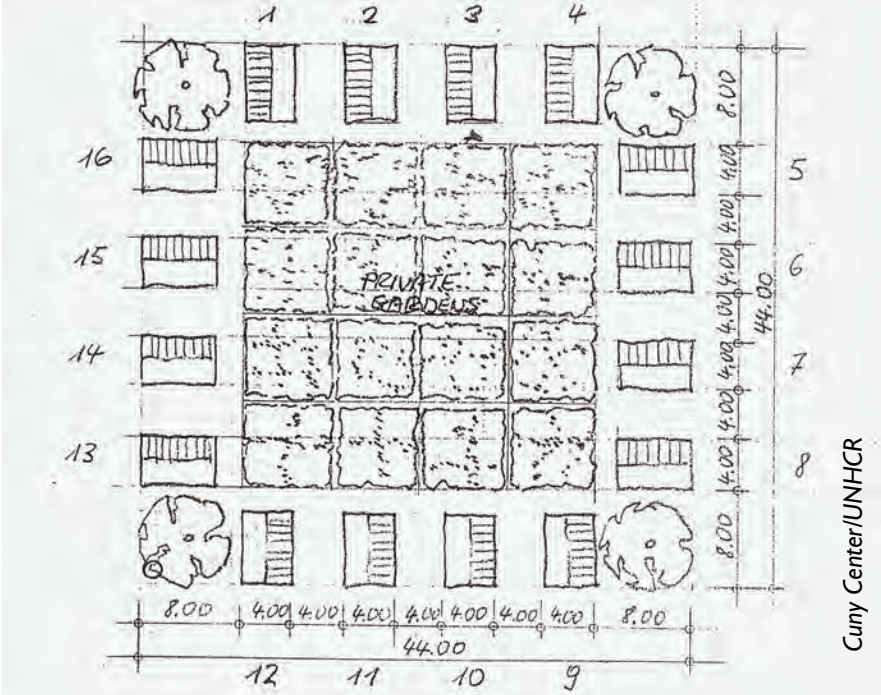
Before 1984, sufficient food had been supplied into Tigray from Sudan. By mid-1984 the Relief Society of Tigray, a national civil relief organisation, stated that the famine had reached crisis levels and that they would lead Tigrayans out of Tigray and into Sudan, where they could receive aid.

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

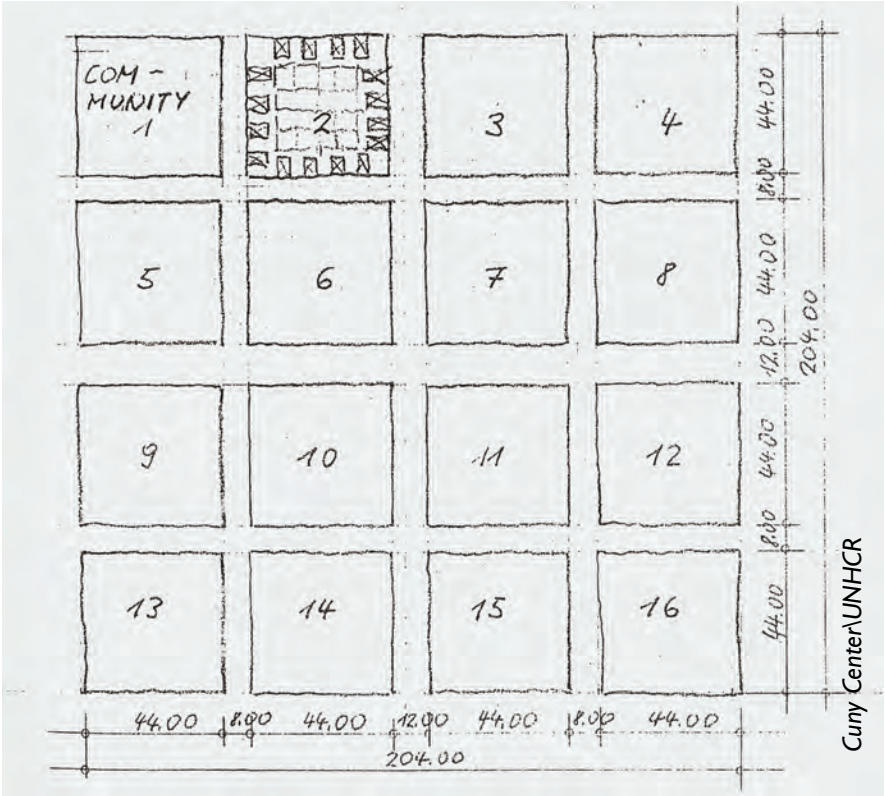
Pressure from the Government of Sudan meant that use of any 'permanent' materials was avoided. Although there were distributions of plastic sheeting, many of the refugees

lived in self-built tukul tents, made from tree branches, grass thatch and cloth.

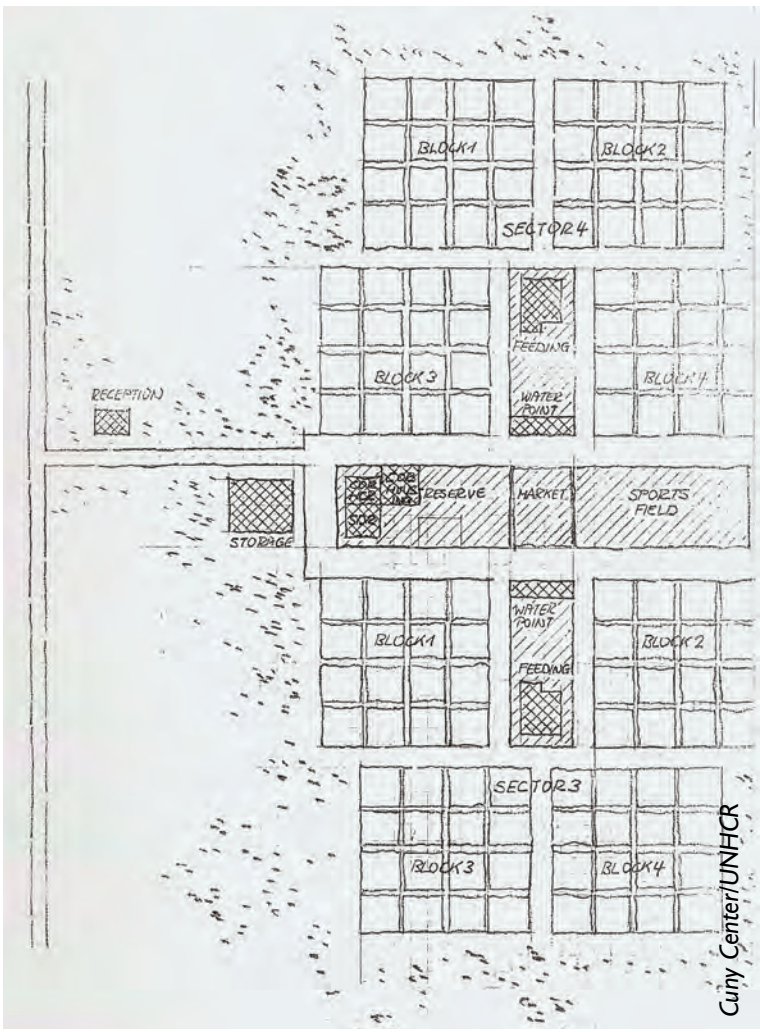
Logistics

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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