

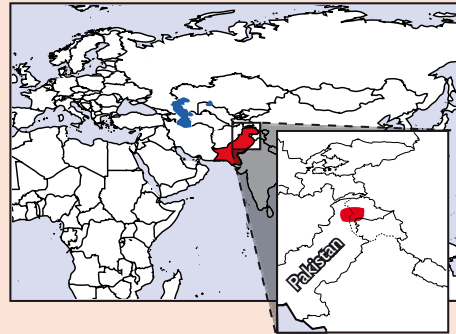
## B.9 Pakistan - 2005- Earthquake

### Overview of the earthquake response

#### Summary

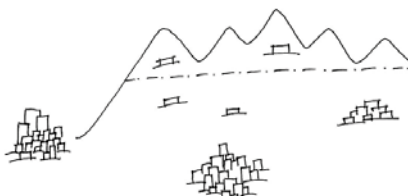
The earthquake in northeastern Pakistan on 8 October 2005 killed an estimated 74,000 people and left over 3.5 million others with damaged or destroyed shelter. The earthquake struck in a mountainous region with winter only months away.

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:

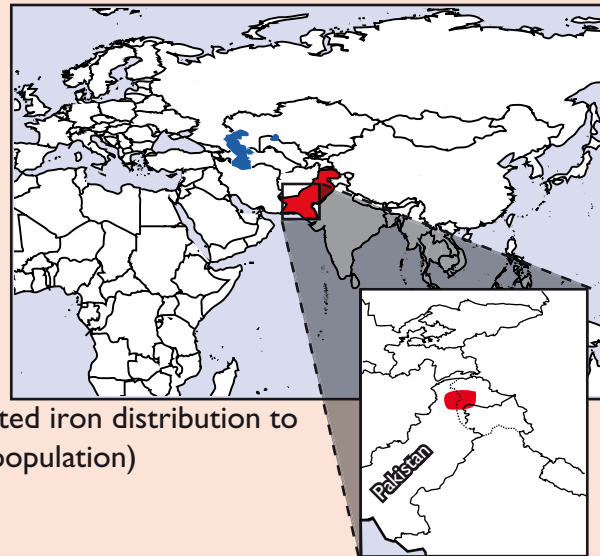
Shelter for 1,125 families, with additional corrugated iron distribution to 657 families (approximately 0.2% of the affected population)

#### 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

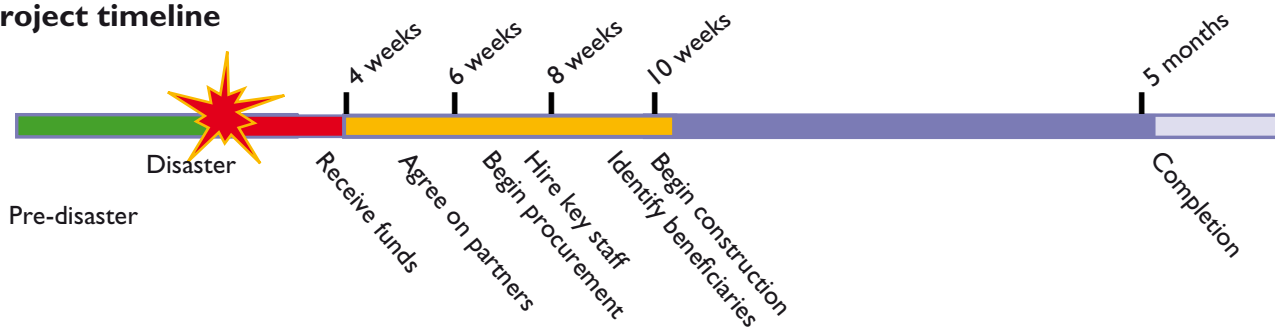
6.5m<sup>2</sup> - 10.5m<sup>2</sup> for people; 2m<sup>2</sup> - 3m<sup>2</sup> for livestock



#### 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

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

X 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.

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

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

W 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.II 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:

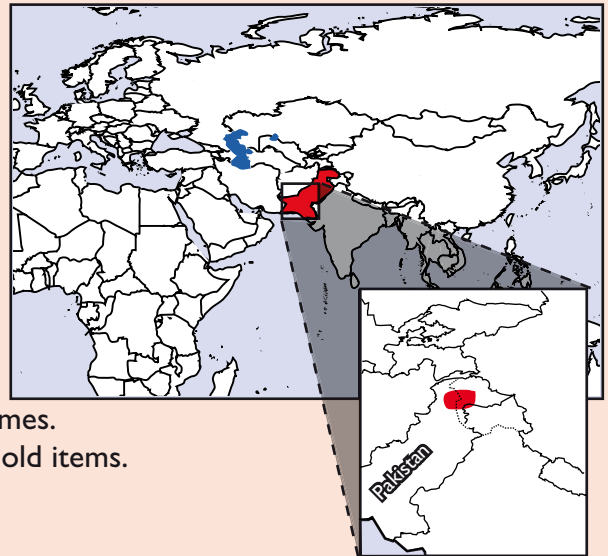
15,900 families were provided with corrugated iron sheets and basic tools to build transitional homes.  
Around 11,000 families received quilts and household items.

#### Occupancy rate on handover:

Unknown

#### Shelter size

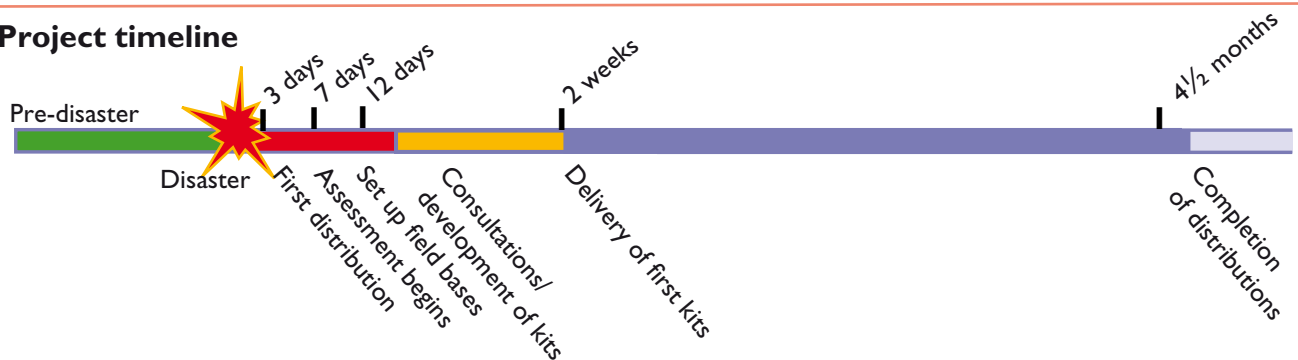
6m x 4m of plastic sheeting and 22m<sup>2</sup> of corrugated iron  
Approximately 18m<sup>2</sup> covered space per family



#### 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

- X An international organisation was able to set up a distribution programme that helped to support over 15,000 families.
- X Beneficiaries were selected on a house by house basis.
- X Materials delivered (including tools and fixings) were selected so that they could only serve to make buildings stronger.
- W 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.
- W 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.

W 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 than five bad quality hammers.

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

W 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