A.21 Pakistan – 2012 – Floods

Case study

Keywords: Core housing / progressive shelter; Cash / vouchers; Site planning; Training.

Emergency: Monsoon floods, 2012, Pakistan.

Date: 7-11 September 2012.

Damage: Approx 635,000 homes damaged or destroyed in total. Approx. 145,000 houses destroyed in Jacobabad. Kashmore: 117,000.

People affected: 4.85 million people were affected by the floods. Jacobabad: 940,000 people. Kashmore: 851,830.

Project location: Jacobabad and Kashmore districts, Sindh province.

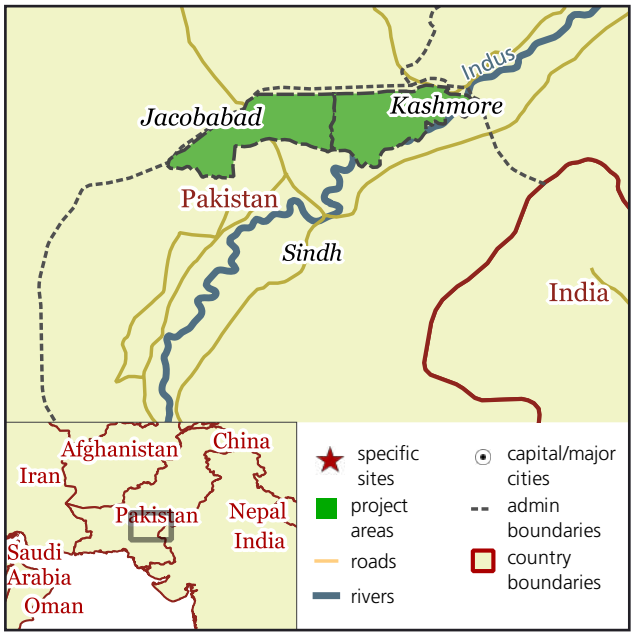
Beneficiaries: 1,000 households (7,000 individuals).

Outputs: 1,000 shelters, and disaster resilience training.

Ocupancy rate: 100%.

Shelter size: 20.4 m².

Cost per shelter: US$ 350 for materials and labour. US$ 443 including project costs.



Project description:

The project provided 1,000 vulnerable families with safe, resilient and locally adaptable shelter.

The shelters were built with some materials and skilled labour provided by the organisation, and with beneficiaries providing some unskilled labour and salvaged or no-cost materials.

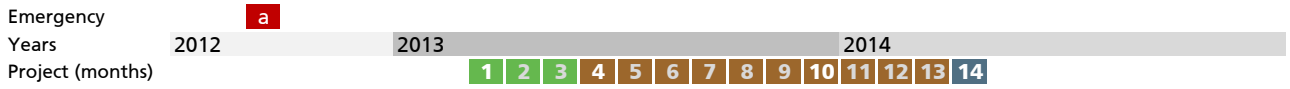
Community members not receiving direct shelter assistance were included in the DRR trainings for mapping hazards and improving shelter construction techniques.

Emergency timeline:

[a] 7-11 September 2012: monsoon flooding.

Project timeline (number of months):

[1-3] March 2013: Planning period.
[4-9] First phase of construction.
[10-13] Second phase of construction.
[14] April 2014: Project concluded.



Strengths

- ✓ Local ownership and leadership of the project were promoted through beneficiary-implemented reconstruction.
- ✓ Solutions to reduce flooding risks were based on traditional and cost-effective methods.
- ✓ The shelter design adopted local best practice of thick mud walls to reduce heat during the summer.
- ✓ The inclusion of non-beneficiaries in construction trainings meant that the design was replicated by other families.
- ✓ The purchase of bamboo from other provinces reduced initial logistical delays and ensured that all beneficiaries received their materials.
- ✓ As part of a multi-sectoral programme that included WASH, the project helped to accelerate a transition from relief to recovery.

Weaknesses

- × Construction targets were delayed due to families prioritising harvesting their crops over working on their shelters. This had been predicted as part of the contingency plan, but had a greater impact than expected.
- × The banking system was unreliable and delayed cash transfers. A second bank began operating towards the end of the project and the organisation was able to switch banks.
- × Increases in the cost of materials, caused by bamboo shortages, were not foreseen. Fortunately the higher costs were offset by exchange rate changes.


Construction of the mud toe. Photo: ACTED.

Situation before the disaster

Before the 2012 floods, the majority of the population in the target area lived in either mud houses called "kacha" or straw structures called "chappar".

Kacha mud houses are built with two layers of lime-stabilized plaster, render, and cane mats ("chicks"), with wooden poles as girders.

Chappar houses use wooden poles or bamboo for the wall and roof structures, with the walls fortified with reeds, often without mud plaster.

Mud-layering and chappar structures are usually built by the families themselves, while mud-brick houses require a mason. Wealthier households lived in more permanent brick structures with cement mortar.

Jacobabad and Kashmore are districts which have been repeatedly affected by recurring floods (including the 2010 and 2012 floods), exhausting the coping mechanisms of the affected communities. As a result, development indicators were worse than the national average.

Situation after the disaster

The organisation's post-flood assessment of 11 worst-hit Union Councils (a local administrative division) showed that the monsoon floods damaged 75% of the houses, of which two-thirds were fully destroyed. Only 20% of the houses were undamaged, with a remaining 5% of households living in temporary shelters as a result of previous disasters.

The high rate of destruction appeared to be related to a major gap in the knowledge and practice of disaster-resilient construction techniques. In the target areas, 63% of shelters were katcha mud houses.

At the time of the assessment, those whose housing had been damaged were living in a number of different situations: 32% of families were reportedly living in the open air, 27% were living in damaged houses, 6% with host families, 6% in temporary shelters, 5% in tents and 4% in public buildings. Shelter was ranked as the most immediate need by the majority of those affected.

Shelter strategy

The shelter cluster strategy focussed on two areas: technical requirements for shelters, and training to improve construction techniques.

Technical requirements

Shelter size had to meet Sphere standards, ranging from 200 to 250 sq ft. (18m^2 to 23m^2) depending on family size. The shelters had to be safe and incorporate a number of Disaster Risk Reduction (DRR) elements, such as strengthened roof and wall structures and elevated platform foundations.

"After the 2011 flood my family was forced to live in a straw hut with little protection or privacy. After building our new shelter, the winter has not impacted on our health. I don't fear the rainy season anymore". Beneficiary

Families whose house had been completely destroyed could receive material or cash support up to a limit of US$ 375 per shelter. Beneficiaries were asked to make their own contribution through no-cost materials, e.g. mud or salvaged materials, labour, and a limited amount of cash.

The shelter design had to allow for adaptations, such as extensions, or the addition of sanitation facilities or kitchens. Vernacular construction techniques were recommended so that communities could build and reconstruct houses using familiar materials and construction processes.

Training

In contrast to 2010, a focus was placed on transferring knowledge about DRR techniques to the community. Trainings to improve shelter safety and durability were coordinated by the Shelter Cluster. Trainings had to be practical and 'on site', with a standardised curriculum in local languages. They were also to be made available to those who were not receiving direct shelter assistance. The involvement of women was considered important, particularly as women are traditionally involved in plastering the walls of their homes.

Project implementation

Following the selection of beneficiaries, the communities were trained on disaster risk-mapping exercises, to identify areas less prone to flooding as construction sites. Landlords were engaged in the process to decrease the risk of disputes over land rights.

The elevated areas identified through community mapping were always within a limited geographical range and relocation to these areas was entirely voluntary. If the beneficiary did not wish to relocate, or if there was no suitable elevated ground nearby, they were encouraged to either construct a raised platform or to raise the floor level of their dwelling.

The project team consisted of a project coordinator, a team leader, a civil engineer, eight sub-engineers and four community mobilisers. The organisation aimed for a gender balance amongst staff members,

Demonstration of side-wall bracing. Photo: ACTED.

partly to ensure the participation and inclusion of female beneficiaries.

Once beneficiaries were selected, the organisation distributed tokens which could then be redeemed for materials from the organisation's warehouses.

Beneficiaries were expected to provide unskilled labour while the organisation provided two skilled workers for around two days to lead the shelter construction.

The organisation paid the skilled workers with bank cheques, but these were problematic since many were unable to cash them due to inter-bank problems.

Beneficiary selection

Families whose houses had been completely destroyed and who were living in emergency shelters, straw structures or severely damaged mud structures were given priority in shelter assistance. Beneficiaries were selected using a score-card method, based on a previous assessment carried out for a WASH intervention.

The WASH assessment included shelter considerations to prevent over-surveying of beneficiaries, and to save time and resources.

Priority was given to households which were more vulnerable to socio-economic deprivation. Project staff then visited each of the selected beneficiary households for final verification and confirmation.

Coordination

The data analysed for the project was collected by the organisation's specialised assessment unit, along with cooperation from other organisations in the area and data provided by the Sindh Provincial Disaster Management Authority (PDMA) and by the Shelter Cluster, on damages, losses, and needs.

The project was part of a more general programme of response to flooding in the Sindh area in 2010, 2011 and 2012.

The shelter design was influenced by technical discussions within the Shelter Cluster during February 2013, and project activities followed the Monsoon Humanitarian Operational Plan and Cluster strategy.

Technical solutions

The shelter design used local practices and familiar materials with targeted improvements to make the shelters more disaster-resistant.

The structure of the shelter was built out of bamboo poles, which were pre-treated by the supplier for termite-resistance.

A prefabricated window and door were also provided, and stairs or a ramp at the door was provided to ease access for the elderly and disabled.

Disaster Risk Reduction (DRR)

Several DRR measures were included:

Beneficiaries were encouraged to build a raised platform made of several layers of pressed soil to protect the base of the structure from flood water.

Walls were fortified with a trellis and plastered with a mix of mud and straw, both of which were beneficiary contributions.

The roof has a 1-foot-high (30cm) incline with 1-foot-long extended eaves. It was built from bamboo, plastic tarpaulin and wooden slats (called "chicks") covered with mud plaster.

The girder was made of two bamboo poles, supported by two pillars made of three bamboo poles each and a central vertical support.

The eaves protected the wall from being soaked and weakened by rain while the plastic sheet on the roof provided waterproofing protection.

The final layer of plaster on the walls as well as on the roof is a 1-part lime to 5-parts mud mix which weather-proofs the shelter and prolongs the life of the structure.

The community was mobilized to identify potential construction sites based on areas of increased resilience to disasters as part of a disaster risk-mapping exercise. The training also focussed on DRR techniques. This was a significant change in strategy compared to the 2010 response, where capacity-building was not prioritised.

Materials

The materials for the shelter were procured in Punjab province, the primary supplier of bamboo in Pakistan. Other materials, especially sand and gravel, were sourced in Sindh province.

Wider project impacts

Some key components of the shelter construction strategy were also adopted by the wider community, such as construction on a raised platform, and installing eaves to prevent rain from soaking and weakening the walls. The use of lime in construction also increased.

The use of tarpaulins for roofs was adapted by other villagers, who used spare plastic bags as a makeshift cover.

Bill of Quantities

Item	Quantity
Bamboo, 2.5" diameter, anti-termite treated, various lengths 9ft – 17ft	71 pcs
Lime (10 % of Mud)	2 x 20kg bags
Chicks (Size 17ft x10ft)	2pcs
Tarpaulin sheet one piece (17ft x 20ft)	1 pc
Cotton Rope 3mm	4 pcs
Steel nails 4"	1kg
Nails 6"	1kg
Steel rivets 9"	9 pcs
Door	1 pc
Window	1 pc
Beneficiary contribution: sticks, straw and mud for plastering, clay.	-