

A.17 Malawi - 2009 - Earthquake

Case study:

Country:

Malawi

Disaster:

Earthquake

Disaster date:

December 6th and 20th 2009

No. of houses damaged:

6,000

No. of people affected:

24,000

Project target population:

2,400 people (rural and urban)

Government construction guidelines also developed.

Shelter size:

New build houses - 45m²

House repair - 20m² to 40m²

Materials Cost per shelter:

House construction (including labour) approx 2,400 USD

Repair grants were 310 USD / household


Project timeline

18 months - – Project completion

3 months - – Project start

December 6th and 20th 2009 - Earthquake

Project description

The project provided materials, cash grants and training to build and repair houses. The project led to national guidelines on safer house construction that were adopted by the government. The project also provided psychological support, hygiene promotion, sanitation facilities for households and schools, and disseminated better building practice.

Strengths and weaknesses

- ✓ Strong links with communities, government, and other organisations enabled access to the affected communities.
- ✓ Communities and local government were responsible for developing the selection process that was managed and implemented by the communities.
- ✓ International links provided access to technical support and specific assistance, especially during the first phase of the emergency.
- ✗ The national organisation lacked the technical experience to implement large scale shelter programmes and had to rely on external support, especially during the first phase of the programme.
- ✗ The organisation was the main, and often the only, provider of assistance after the earthquake. Deploying and sharing the resources of other ongoing programmes was a challenge in terms of personnel, vehicles, office space, and finance and administration systems.

- ✗ The projects had to be implemented within a short time to coincide with the dry season, to meet donor requirements, and to meet the expectations of the community. This created a constraint in terms of time available for staff development and training, maintaining quality assurance, and the timely resourcing of the programme, such as the purchase of equipment and access to funds.
- The recovery programme was able to engage with other initiatives that were running prior to the earthquake, such as housing and urban planning projects, and disaster risk reduction planning and preparedness. Through the support of an international agency, partnerships were formed with government and other stakeholders to develop a disaster risk reduction strategy to assist reconstruction.

Before the earthquake

Malawi is one of the lowest income countries in the world, with many households having cash income below one US dollar per day. The population is mainly rural, living in scattered communities focused on agricultural activities. Land is allocated through traditional authorities. In urban areas property and land is bought or rented.

Traditional houses are built from wattle and daub with thatched roofs. While lacking durability, these dwellings were largely undamaged by the earthquake, provide good thermal comfort, and are constructed using local materials. All other buildings are of brick and block construction.

At the low-income end of brick construction, houses are built with un-burnt brick and mud mortar. Where there are sufficient resources, bricks are burnt using locally sourced firewood.

To economise on the use of bricks, walls a single brick thick were often built. These walls are not earthquake resistant. Additionally, the position and size of doors and windows and the type of un-braced roof construction, added to the structural failing of the buildings.

Houses are generally constructed over a period of time, as families gain the resources to purchase the required materials.

In rural areas most households owned the houses they lived in. In the urban areas many were tenants and had less opportunity to build or repair their homes.

Issues of public health were greater in the urban area. Latrines in the rural areas were generally constructed using local materials, whilst in urban areas many were built of brick, but were no longer usable.

After the earthquake

The first earthquake on the 6th December destroyed and damaged thousands of houses, hundreds of schools and public buildings, cracks appeared in the ground and the levels of the earth altered in some locations.



The project led to the establishment of national guidelines on safer house construction and had a strong training component. Photo: Jamie Richardson

The number of deaths and injuries were relatively low but, as this part of Malawi had never experienced an earthquake, the population was traumatised by the event and was fearful of going back to their homes.

On the 20th December there was another earthquake.

In some areas near the town of Karonga, the land is lower than Lake Malawi, and there was the natural fear that the earthquake may cause fissures that would lead to flooding. This community moved to an area of high ground where the government and other agencies established a temporary camp.

In the first months after the emergency most households slept in temporary shelters outside their houses. There was a limited distribution of tents, but for most, temporary shelters were constructed using local materials such as timber and thatch.

Implementation

One of the guiding principles for the project was that householders, communities, and government were responsible for providing safe and adequate housing. The organisation would provide support where there were gaps in skills, knowledge, and resources.

The following parallel activities were implemented:

- Construction of new houses
- House repairs
- Construction of latrines
- Training of hygiene promoters
- Training of artisans
- Beneficiary dissemination workshops
- Guidelines for safer house construction

Two project officers were appointed to manage the urban projects and the rural projects and both shared resources and staff.

Guidelines for safer house construction

During the emergency phase of the response, an international shelter specialist assisted. This expertise led to the organisation taking a national lead in shelter and allowed an alliance to develop with government, other agencies and non-government organisations working in housing and shelter. This group was given the responsibility by the government to produce guidelines on house construction to assist the recovery process. The guidelines were produced as a manual and as a series of posters.

It was recognised that information should be made available nationally to reduce the risk of all hazards, including earthquakes. The guidelines would be the start of a process to create national guidelines and standards for construction.

Construction of houses

The Government of Malawi had already produced designs for rural housing and these designs were adopted and modified to improve structural performance.

Every beneficiary was given a range of designs to choose from. They were given the possibility to make further modifications so long as these met the design guidelines.

Both householders and artisans were provided training to ensure that important construction details and methods were implemented. The organisation provided construction supervisors to monitor and assist the construction process.

Cash grants were provided to the householder to purchase materials and pay for labour. Payments were made in tranches aligned with the phases of construction. The householder was responsible for the construction.

The houses were constructed using locally made burnt brick, mud and cement mortar, timber for the roof structure and joinery, and iron sheeting for roofs.

House repairs

The construction supervisors, with the householder, surveyed the houses to identify the repairs and produce a prioritised schedule of work and an approximate budget.

The householder was paid a grant in two phases to carry out the work. Repairs focused on strengthening each element of the structure.

Hygiene promotion and sanitation

The urban part of the recovery programme identified a need for better sanitation and hygiene practice. In addition to house repairs, 250 household latrines and school sanitation facilities were constructed.

Selection of beneficiaries

The project targeted the most vulnerable within the communities. Vulnerability criteria were collaboratively identified.

Community groups were established to identify beneficiaries, to



Houses were built through cash grants. Cash was transferred by mobile phone. Families were encouraged to purchase work in groups to obtain lower prices. Photo: Jamie Richardson

process the application, and to have officers from government and the organisation verify the applications. An appeals process was established to allow for the review of an application.

This method of selection empowered the communities, allowed government to have responsibility for the administration of the recovery process, and enabled the organisation to provide support and monitoring of the process.

Technical solutions

There were many constraints in terms of available materials, financial resources, skill level, and cultural aspiration. This led to the choice of brick construction.

Proper brick bonding, the use of lintels to brick openings, the bracing of roofs and methods in connecting the brickwork, were not previously applied. The position and size of door and window openings was addressed, as was the design of unsupported masonry such as gables and internal partition walls.

Cash transfers

The transfer of funds provided a challenge in the rural areas, and was implemented through a partnership with a mobile phone company.

Beneficiaries were given a phone and funds as credits were transferred to their phone. These credits could be exchanged for cash through the phone company's outlets, or exchanged for materials at specified hardware stores.

Logistics and supply

Beneficiaries were encouraged and supported to buy materials in groups. The suppliers could then maximise efficiency and minimise rates charged by delivering in quantity. The organisation provided four wheel drive vehicles for transport when required.

Local suppliers were used for all materials other than the doors and windows, which went out to tender and were purchased in the capital.

Materials list

Materials	Quantity
Timber 1" x 8" (25x200mm)	17
Bricks (230 x 115x 75mm)	8400
Wire mesh	25 m ²
Chlorodine (Anti-termite treatment)	1l
Cement	22 bag
Reinforcement bars 12mm x 12m	17
Supporting plain bars 6mm x 6m	5
Solignum (timber treatment)	1l
Damp proof course	3
Quarry stones for the ring beam	3 Tonnes
Timber 2" x 3" (50x75mm)	16
Timber 2" x 4" (50x100mm)	3
Timbers 2" x 6" (50x150mm)	25
Wire nails 2" (50mm)	5Kg
Wire nails 3" & 4" (75,100mm)	7Kg
Wire nails 5" & 6" (125,150mm)	15Kg
Roofing nails	18Kg
Galvanized ridges	5
Iron Sheets 28 gauge x14' (4.3m)	28
Sand for pointing, plastering, flooring	8 Tonnes
Cement for pointing, plastering, flooring	26 bags