A.7 Fiji – 2012 – Tropical Cyclone Evan

Case study

Keywords: Transitional shelter / T-shelter; Advocacy / legal; Training.

Emergency: Tropical Cyclone Evan, Fiji.

Date: 17-19 December 2012.

Damage: 8,500 houses damaged in the "formal" sector, 177 houses destroyed in the "informal" sector.

People affected: Over 40,000 people affected in the formal sector and over 800 displaced in the informal sector.

Project location: Coastal areas of Western Division.

Beneficiaries: 254 households (approximately 1,250 people).

Outputs: Phase 1: 120 T-shelters, Phase 2: 134 T-shelters (70 complete as of Sept. 2014, 66 for emergency stockpile)

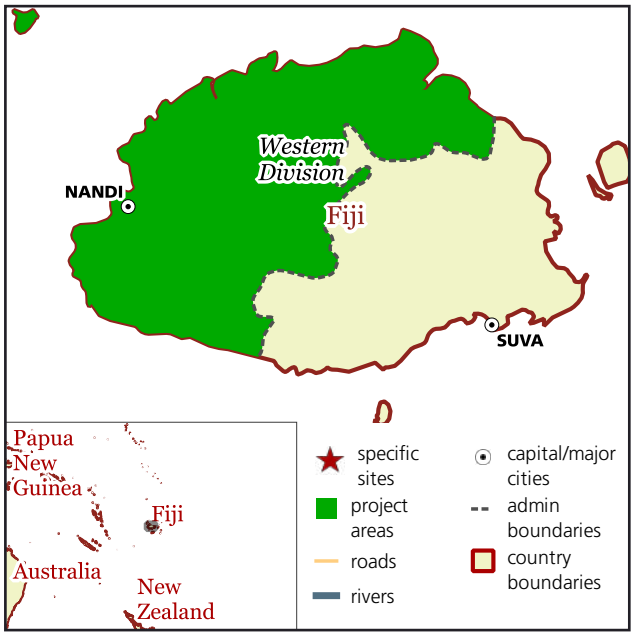
Ocupancy rate: 100% in Phase 1.

Shelter size: 21m² (6m x 3.5m).

Cost: Materials and labour per shelter: 3,200 Fijian dollars (FJD) (US$ 1,800); total project cost per shelter: 5,300 FJD (US$ 2,900).

Project description:

Provision of T-shelters for families living in informal settlements whose shelters had been completely destroyed by the cyclone. Beneficiaries were trained in construction techniques and provided labour. T-shelters had to conform to government specifications as permanent housing in informal settlements is illegal, though the construction work opened the door to discussions on housing rights for the poor.



Emergency timeline:

[a] 17-19 December 2012: cyclone hits Fiji.

Project timeline (number of months):

[1] March 2013: MoU signed with government.
[1-4] Beneficiary selection, local procurement.
[5] Import application.
[6-7] Beneficiary confirmation.
[7] Prefabrication.
[8-10] Construction for Phase 1 complete.
[11] Jan 2014: Funding for Phase 2 secured.
[12-13] Local procurement.
[14-15] Beneficiary confirmation.
[16-19] Prefabrication and construction.
[20] Project completion.

Strengths

✓ The organisation negotiated for official construction in informal settlements, leading to long-term improvements for the inhabitants.
✓ The project had a gender-equality component, since married homeowners signed an agreement for equal ownership.
✓ Family members were trained in basic construction skills, improving local knowledge on safe building practices.
✓ Panels, stairs, doors and windows were prefabricated in a makeshift depot on site, significantly speeding up the construction process itself.
✓ The successful completion of Phase 1 persuaded the donor to provide another round of funding for Phase 2, increasing the number of households supported.

Weaknesses

× The plan did not allow for the delays caused by difficulties in sourcing timber locally and the extra time required to import materials.
× In one case, beneficiaries expected a complete, permanent house to be built, which demonstrated more work needed to be done on communications.

Situation before the disaster

As construction in informal settlements was illegal, homes were built without any regulation. Compounded by the poverty of the inhabitants, the homes were constructed to a very low standard and were extremely vulnerable to natural disasters.

Situation after the disaster

Immediately after the disaster many families moved in with neighbours or family members whose homes had not been not destroyed. The Fiji government census does not cover informal settlements, and since not all the informal settlements in the affected area were surveyed, the true number of people affected was not clear. Some of those people excluded from the post-disaster surveys had lost everything.

Those that stayed on the site of their destroyed homes pieced together shelters that were even more poorly built than their previous homes. Many continued to live under leaking tarpaulins and rusty sheets of roofing iron for up to a year after the cyclone hit.

Shelter strategy

The Shelter Cluster was established in Fiji in January 2013 as a direct response to Tropical Cyclone Evan. A national strategy was agreed whereby the government would address the needs of the 8,500 houses damaged in the formal sector (homes built on land officially classified as residential and following building code regulations) while the Cluster would address needs in the informal sector (homes built illegally, without access to utilities).

A consortium of NGOs documented 177 homes completely damaged in 41 informal settlements in the most affected areas.

Though the government was supportive of interventions to assist those in informal settlements, it did not want to be seen to condone or approve the settlements. Supporting the Shelter Cluster strategy was the first time in Fiji that the government has taken any action regarding shelter in informal settlements.

As construction in informal settlements was illegal, several NGOs signed a Memorandum of Understanding (MoU) with the Fiji Government in March 2013 to allow construction in informal settlements for five months, specifying that structures had to be non-permanent.

The Cluster's advocacy for supporting people in informal settlements was effective, with the Housing Ministry supporting an extension of the MoU for a second round of construction after seeing the positive impacts of the first phase.

Project implementation

In the first month, a survey was conducted by the Cluster, to identify affected families. During the assessment, landowners had to provide consent for the erection of the non-permanent shelters on their land, while potential beneficiaries had to confirm that they had previously lived on the site.

In some cases, where the site itself posed a number or risks, T-shelters could be built in new locations instead.

The organisation was responsible for procurement and construction, with families contributing in terms of labour. Once selected, beneficiaries become "home partners" in the project. This involved beneficiaries agreeing to contribute to the building of the shelter ("sweat equity") and undergoing basic construction training. Family members become part of the construction crew from start to finish.

Four teams made up of four technical staff each were formed, and the shelters were built in batches of three or four at a time, with each structure taking three days to complete.

On-site, a makeshift depot was set-up using materials that would later be used for the last T-shelters. Two teams worked in the depot, producing seven sets of wall frames per day. The other two teams laid foundations as beneficiaries were identified. When the foundations had cured, the two depot-based teams erected the frames.

An example of the poor quality shelters characteristic of the "informal" sector. Photo: Habitat for Humanity Fiji.

The rest of the structure was completed with labour assistance from the families.

Beneficiary selection

Damage from the cyclone was clearly visible and identifying affected families was straightforward. The informal settlements themselves were easily identified against the registry of formal communities managed by government.

Though the beneficiaries had to confirm during the initial assessment that they had previously had a house before the cyclone hit, a check was conducted just prior to construction, in order to confirm that the applicants were still at the shelter location. This involved the triangulation of information from the government district office, photographs taken immediately after the cyclone, the original survey data and information from neighbours.

The project only had funding for a limited number of shelters but the technical team assessed each damaged house and spoke directly with homeowners to discuss whether their house was still structurally sound, or needed certain repairs. Many families who did not qualify for assistance from the project remain in poorly built homes and it is likely that many of their houses will not survive the next severe storm.

While waiting for the T-shelters to be built some beneficiaries repaired their homes to a very basic level while others continued to live with neighbours or family.

Coordination

The organisation was the main actor in meeting shelter needs in informal settlements and, once the

MoU had been signed, was able to work independently in the areas of operation. Some community organisations provided materials that could be used to build one small room, but these were provided without any technical support and there was no formal cooperation with these organisations.

This family used savings to build a proper floor, despite contravening government regulations. Photo: Habitat for Humanity Fiji

No rigid wall linings were permitted, so plastic sheeting was used instead. Photo: Habitat for Humanity Fiji

Technical solutions

The erection of structures that were approved by the Ministry of Local Government, Urban Development, Housing and Environment in informal areas was itself a technical milestone in construction practices in informal settlements.

Though the structure was initially designed with rigid wall and floor lining, the government said that the use of permanent wall and floor lining would constitute a permanent dwelling and banned the use of those components in the early part of the design stage.

Tarpaulin walls were used instead, and floors were designed to be made of raised compacted earth. It was understood amongst Cluster members that homeowners would opt to use permanent wall lining as soon as they could afford it, so the structural frame was designed to withstand severe cyclonic wind loads in anticipation of the eventual replacement of the tarpaulin with a rigid material.

Many families opted not to have the tarpaulin lining because they preferred to use roofing iron they had salvaged from their damaged homes as a more permanent wall lining solution.

Disaster Risk Reduction (DRR)

While the structures could not be classified as providing a completely safe refuge, the T-shelters were designed to withstand the wind load of a Category Four cyclone (175 km/hour winds), with all bottom plates strapped to bearers and all rafters strapped to top plates. CGI roofing was secured with cyclone twisted nails with neoprene washers on every crest. Each shelter was raised 300mm from the ground on a rammed-earth base with treated pine pole foundations.

The most important factor in determining whether the T-shelter design could be used in the emergency or recovery phase of a disaster was the availability of materials, particularly in a remote location like Fiji. In the second phase, in addition to additional shelters for families, 66 T-shelter kits will be prepositioned for later disaster response. This project is probably only one of a few worldwide to preposition shelters with such a high level of structural integrity.

Materials

CGI sheets, posts, and strapping were purchased locally but timber was in such short supply in the aftermath of the disaster that sixteen containers of timber had to be imported, resulting in delays to the project.

Wider project impacts

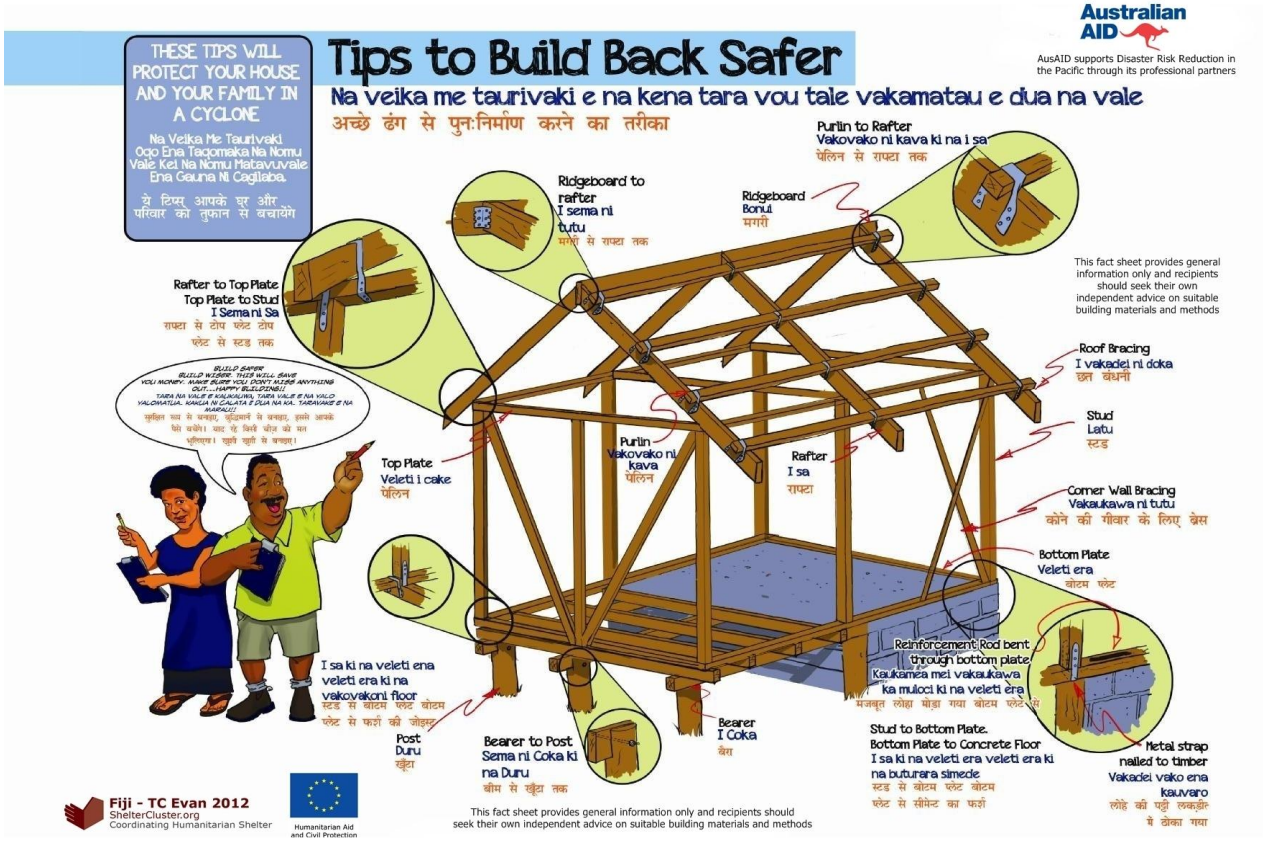
The T-shelters were designed to be portable and could be dismantled with very basic tools in less than a day. Only the pine posts that were embedded in concrete could not be moved. This meant that beneficiaries who might be forced to move out of informal areas will be able to take their homes with them.

The project opened up a dialogue with the government about shelter conditions in informal settlements. The organisation's relationship with the government was strengthened and the government's approval of the project has been a major step towards realising the right to adequate housing. The organisation is also being considered as a preferred implementer of government-funded projects, giving it an even stronger voice to speak up for vulnerable families.

Unprecedented in informal settlements in Fiji is the right to reside and the right to homeownership. These were secured through signed agreements with landowners. In support of women's rights to adequate housing, co-ownership agreements had to be signed between a husband and wife before construction could commence.

Framing components and instructions

Member	Remarks
Pine Post (1m x 15cm diameter)	Embed 60cm in ground, fill with concrete.
Bearers (15cm x 5cm)	Nail & strap to post.
Bottom plate (10cm x 5cm)	Nail to top of bearer.
Wall studs (10cm x 5cm)	Nail & strap to top & bottom plate
Noggins (10cm x 5cm)	
Top plate (10cm x 5cm)	Strap to stud
Rafter (15cm x 5cm)	Strap to top plate
Purlin (7.5cm x 5cm)	Strap to top plate
Facia (20cm x 2.5cm)	Attach to gutter end only
Strapping	
CGI sheet	Nail to purlins with galv. twisted roofing nails
Canvas/tarp wall lining (2m x 17m)	All edges fixed with 2.5x1cm battens and roofing nails
Flashing, gutter & downpipe (7.5cm diameter)	



Part of the project's Disaster Risk Reduction strategy was communicating the Shelter Cluster messages on how to "Build Back Safer".
Graphic: Shelter Cluster Fiji.