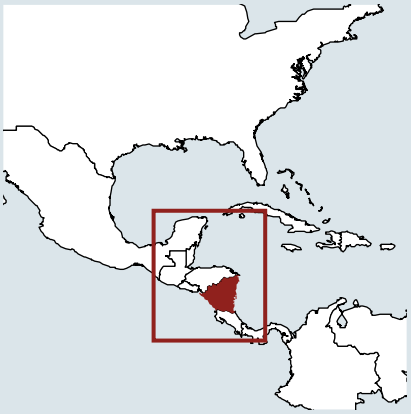
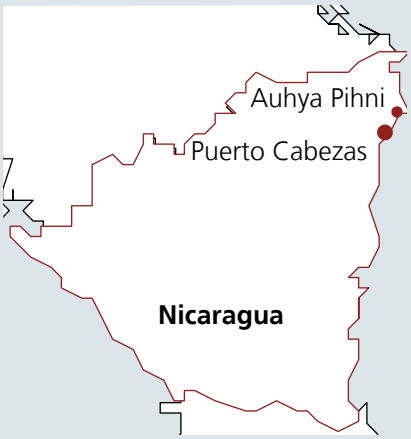
A.19 Nicaragua – 2007 – Hurricane

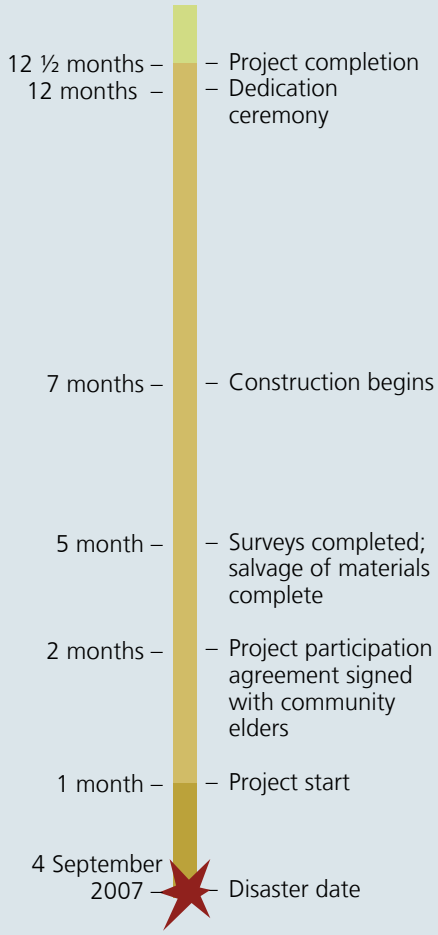
Case study: **Keywords:** Non-displaced, Construction materials, Core housing construction, Site planning, Training.

Country:
Nicaragua
Project location:
North Atlantic Autonomous Region
Disaster:
Hurricane Felix
Disaster date:
4th September 2007
Number of houses damaged destroyed:
7,895
Number of people displaced:
35,100
Project outputs:
150 core houses
50 community members trained in carpentry skills.
Occupancy rate on handover:
100 per cent
Shelter size:
30m²
Materials cost per shelter:
US$ 1,400
Project cost per shelter:
US$ 2,000





Project timeline

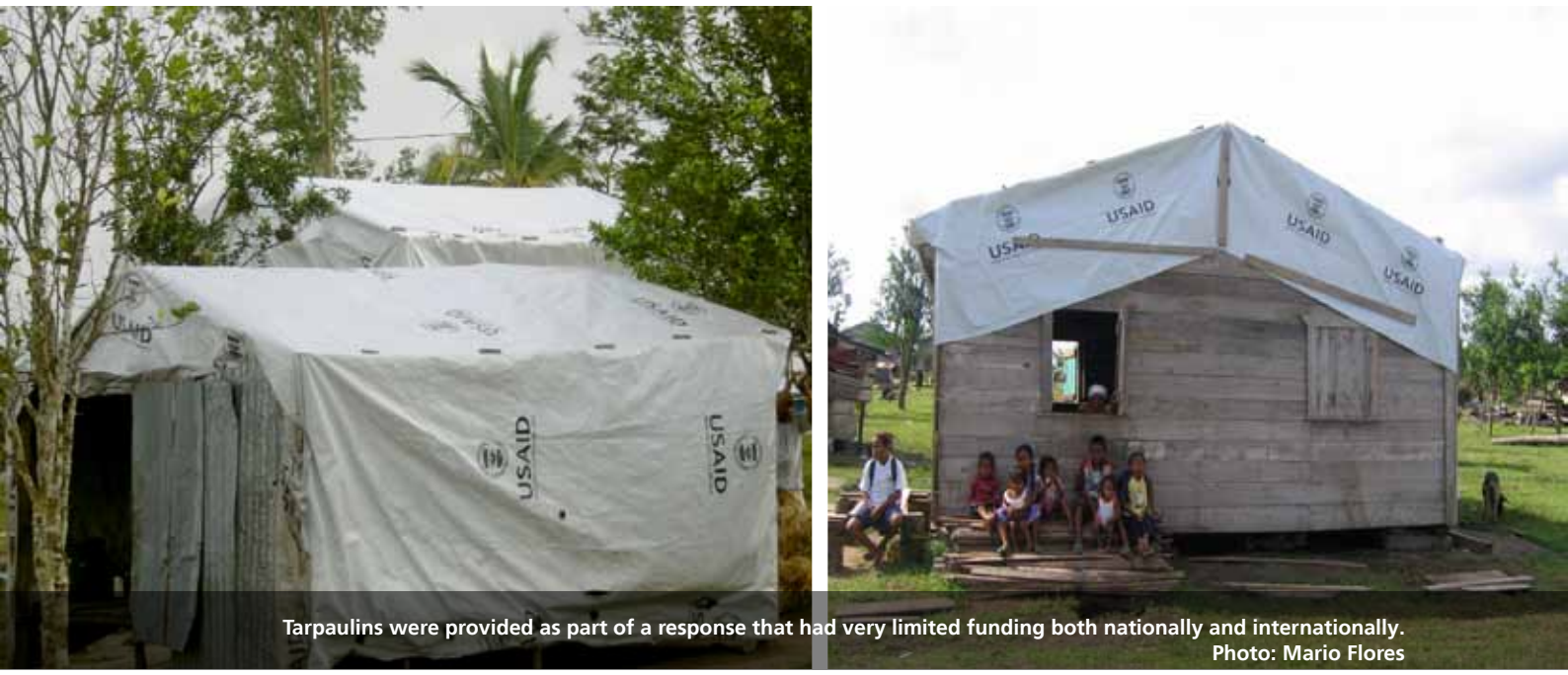


Project description

This project was implemented in the context of a poorly funded response and recovery operations for the 2007 hurricane in Nicaragua. The organisation chose to focus its limited budget on providing improved shelter conditions for nearly the entire population of one of the most affected villages. The project included physically re-planning the settlement, building 150 new core houses, and training community leaders and work crews.

Strengths and weaknesses

✓ The engineering design of shelter solution was of high quality.
✓ The reconstruction project enabled the settlement layout to be rationalised and improved.
✓ The carpentry skills training component provided livelihood opportunites.
✓ The shelter project addressed almost 100 per cent of shelter needs in the Auhya Pihni community.
× The project scale was limited (less than 2 per cent of the affected population) and did not address the needs of the majority of affected people.
× The project did not include improveming sanitation facilities. Some families rehabilitated latrines in parallel to the shelter intervention but many remained substandard.
× By choosing to concentrate all of the support in only one village, the village selection process became pressured.
- There was a strong pre-existing level of organisation in the affected community, facilitating communication.
- The project entailed the use of ethnic language interpreters, leader orientation techniques, knowledge-transfer and community training methodologies to avoid cultural and language barriers with the target population.
- Having a local church partner with insider knowledge of local power-brokers was crucial. The fact that the church was respected helped to legitimise the introduction of labour agreements between the implementing organisation and the beneficiaries.



Tarpaulins were provided as part of a response that had very limited funding both nationally and internationally.
Photo: Mario Flores

Before the hurricane

Auhya Pihni is a settlement located 55km north-west of Puerto Cabezas, comprising indigenous Miskito people. The settlement is within the autonomous RAAN region, and has its own tribal laws.

The project village is one of ten Miskito communities who possess approximately 150,000 hectares of land. Traditionally Miskito people live in large houses with their extended family. The size of the extended family has reduced over time, with the village community playing a similar role. Kinship in the community remains matrilineal.

Lands are communal, and a Council of Elders acts as a decision-making body. The person with the position of Justice within the council served as the chairman of community leaders. These leaders have the final say in decisions affecting the community.

Most of the inhabitants survived on unstable, sporadic sources of income, and many of the families were living in extreme poverty before Hurricane Felix struck.

The water table at the site is very close to the surface and the part of the settlement located close to the river is prone to flooding.

According to the 2005 population Census, 65 per cent of households did not have access to basic water and sewage disposal, while nearly half of households had no toilet and 7 per cent shared their latrines with other families.

After the hurricane

On 4th September 2007, Hurricane Felix, a category five storm, hit the north-east coast. Winds of 260 km/h caused widespread devastation. In the provincial capital city of Puerto Cabezas, the hurricane caused severe damage to houses and services, cutting off all communications. The hurricane caused over 160 deaths.

Nearly 8,000 houses were destroyed and smaller settlements such as Auhya Pihni were completely obliterated. The day after the hurricane the government declared a ''national state of calamity".

Neither the government nor the international community were able to commit the funding to respond to the overwhelming shelter needs.

Some tarpaulins were provided as emergency shelter by relief agencies to enable families to stay in their houses and prevent further displacement. Many families combined the sheeting with reclaimed materials to make shelters.

Selection of beneficiaries

Surveys were conducted by a group of Nicaraguan NGOs to select a community. Meetings were also held with local authorities, influential church leaders and elders from the Miskito community.

The community of Auhya Pihni was chosen, and 150 families were selected as beneficiaries out of a total of 167 households.

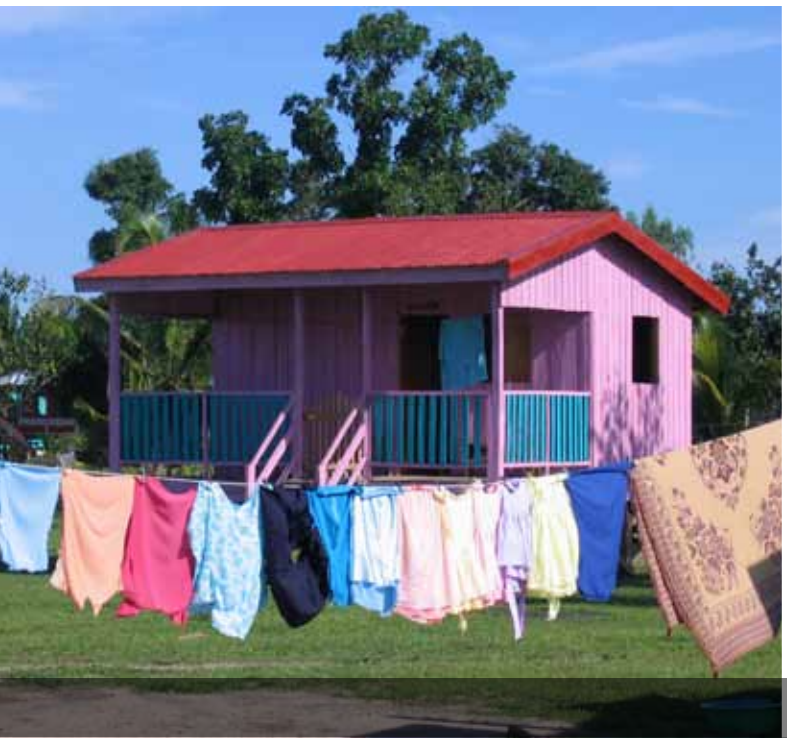
Implementation

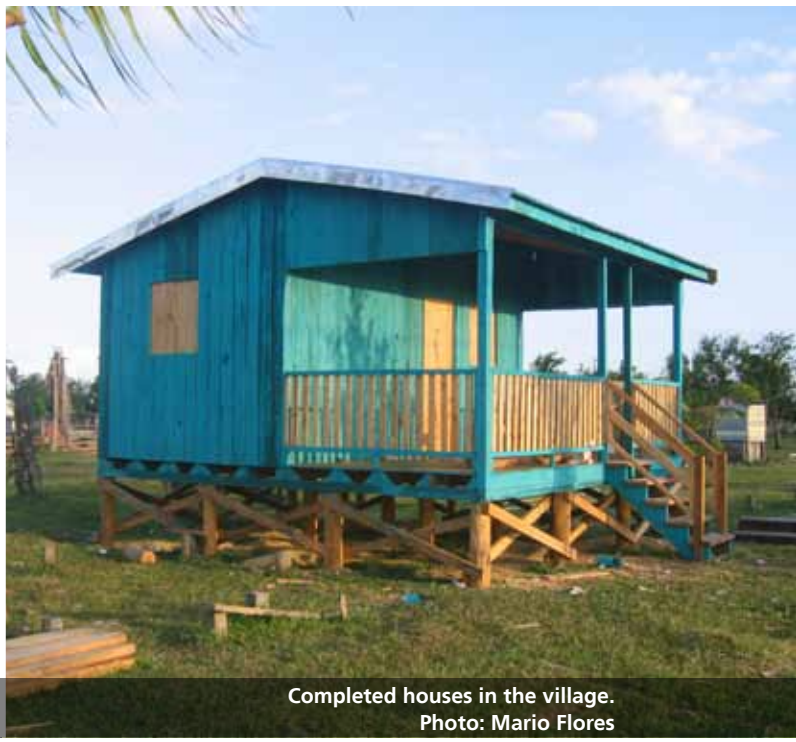
Following previous organisations' unfulfilled promises of assistance, the community were initially distrustful. However, once the first two model houses were built, trust improved.

To build the shelters, local labour was hired from the affected community to support skilled carpenters brought in from Puerto Cabezas and other towns.

A processing centre for timber was established within the community, and homeowners were paid to support the production and fabrication of construction elements, including posts, wood frames and rafters.

Through its external networks, the local church was able to provide power tools. Community-owned timber processing equipment was also made available.





Completed houses in the village.
Photo: Mario Flores

Workers involved in the project were trained in carpentry and home construction by the organisation. Some were trained in the production of wooden doors and windows, which included the use of woodworking machines.

To build the houses, the organisation established six construction teams, each led by a community leader.

Coordination

Due to lack of funds and the limited number of organisations operating, there was very little inter-agency coordination. Overall, local coordination with the church and local authorities was good.

Technical solutions

The house design followed a local design, using familiar materials: timber for most of the house components and corrugated galvanized sheeting for the roof.

The final design and covered area (30m²) was agreed with the community representatives through a process assisted by architects from another local organisation.

The design included three simple disaster risk mitigation features that were new to the community:

- elevating houses on stilts to reduce the risk of flooding
- cross-bracing supporting posts
- metal straps to reinforce connections of wooden elements
- a strengthened structural design
- use of twisted roofing nails to better secure roofing sheets.

The goal of these incremental changes was to build stronger structures with better tied down roofs.

Sanitation

Before the hurricane, most households either had or had previously used latrines. The organisation did not get involved in latrine construction, but another organisation was able to build latrines for 35 per cent of the households.

There was some disagreement between the two organisations about the low level of coverage, but budgetary constraints prevented further work.

Logistics

Approximately 10 per cent of the timber was salvaged from damaged houses. The quality of materials was approved by the homeowners and the project engineers to ensure that their use would not weaken the houses.

The community initially rejected the use of pine to build shelters, because they wanted a more durable housing solution.

The forest had long been a significant source of livelihoods for this community. Before the hurricane, a community organisation had been established with the support of an international organisation to manage the local forest resources. As a result, the forestry resources were well managed for the use of this project, minimising any negative environmental effects.

The organisation was able to purchase the timber at a discounted price from this community organisation who put the money into a community fund for community projects.

All timber came from within 10km of the village and was transported by river.