

D.6 India - Andhra Pradesh - 1977 - Cyclone

Case study: Materials distribution and training

Project type:

Distribution of building materials
Training support

Disaster:

Cyclone in Andhra Pradesh, India

No. of people displaced:

3.4 million people in total; 20,000 in the administrative area where the NGO was working. Virtually 98% in areas affected by the tidal wave.

Project target population:

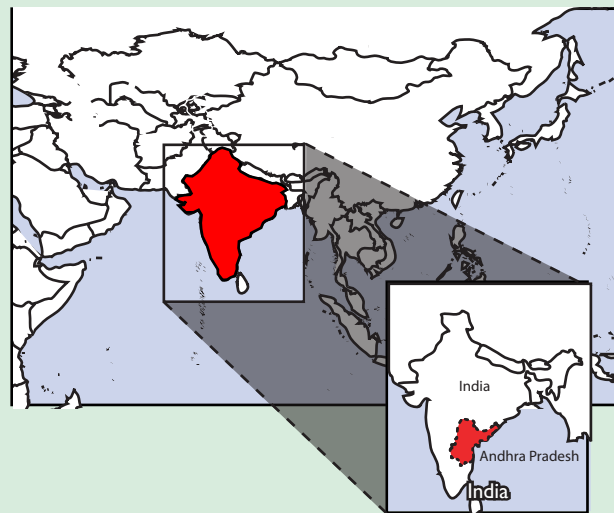
2,000 households

Occupancy rate on handover:

Not known

Shelter size

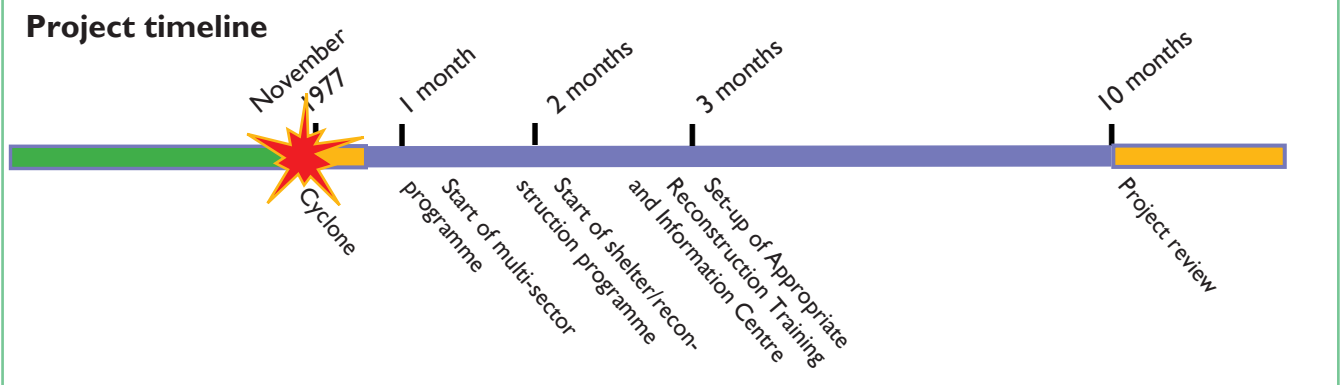
25m² (constructed from distributed materials)



Summary

The distribution of basic kits of local materials, supplemented by materials for strengthening cyclone resistance, was supported by the inter-organisational creation of a special centre to provide technical training and information. The project was timed, and in some cases postponed, to ensure that labour was not diverted from agricultural tasks and to ensure the availability of appropriate materials.

Project timeline



Strengths and weaknesses

- X Where recoverable materials were available, affected communities were able to reconstruct sufficient shelter for themselves.
- X Livelihoods, and the recovery of the rice crop and paddy fields, were recognised as being of primary importance to long-term sustainable recovery. The shelter construction schedule was adapted accordingly.
- X Traditional materials choices and traditional building methods were supported and strengthened.
- X Using inter-agency coordination to set up a specialised technical training centre created a neutral forum where all actors could get information and could receive evaluations of their progress without bias.

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- W Resources were wasted, and beneficiary dependency encouraged, by the distribution of materials where affected populations had already rebuilt their own shelters in the first phases.
- W Gaps in coordination prevented a systematic and equitable response to all affected areas, and in some cases resulted in the provision of inappropriate housing types and response methodologies that were damaging to the recovery process.
- W The promise by some organisations that 'pukka' houses for the beneficiaries would eventually be constructed actually held back the process of recovery in wider ranges of affected communities.

Before the cyclone

The affected population was predominantly rural, farming rice and keeping livestock to supplement their income. The affected areas were all low lying and were intensively cultivated.

The vast majority of the population lived in houses made of traditional materials. Common materials were bamboo and palmyra leaf thatch (made from a certain type of palm tree). Before the cyclone there had been official encouragement to make houses 'pukka' - made using reinforced concrete. Pukka housing was also preferred by much of the population and displayed a higher social status.

Some of the faith-based and local organisations that were involved in the emergency response had been working in the area since at least 1969. Many of the larger international organisations were new to the area.

After the cyclone

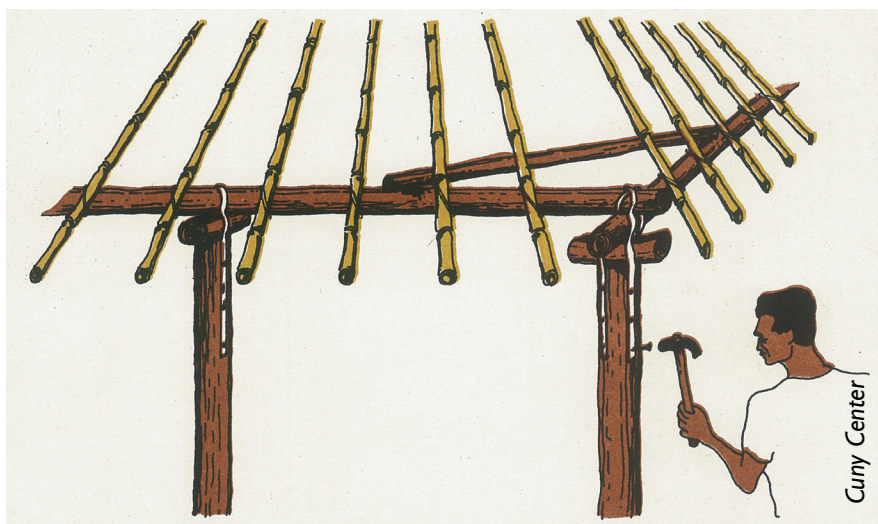
The cyclone created two different areas of damage: an area damaged by a six-metre tidal wave that travelled as far as 24km inland at its furthest point; and an area damaged by high winds reaching over 270km/h, all along a 50km stretch of coastline.

In the areas affected by the wind alone, many of the materials from the destroyed houses were still lying nearby. About 90% of the surviving population very quickly built their own shelters using this material and removed the need for 'emergency' shelter support.

In the areas affected by the tidal wave almost all of the original housing materials had been washed away, so the survivors were in need of shelter materials.

The local government distributed poles and palmyra thatch during the first few days, with aid agencies joining in later. The NGOs had started programming in the health and medical sectors, but quickly changed their focus to shelter.

The local government requested that the humanitarian organisations construct pukka housing for all beneficiaries and offered 50% matching funding to all organisations who chose



Safer shelter techniques - strapping columns to beams

to do so. There was also pressure from the government and from international donors (and from within some organisations) to start construction immediately, using outside contractors or non-local volunteer forces if necessary.

It was recognised that the tidal wave had left dangerous levels of salinity in many of the communities' paddy fields, and that the greater need was to recover what was left of the previous rice crop, and then to unblock irrigation canals and flush out the paddy fields. Some feared that the large labour force needed for the immediate construction of concrete housing would divert efforts from the agricultural efforts and, in doing so, block long-term recovery. Therefore, a two-pronged strategy was advocated and involved:

- supporting the beneficiaries in their own reconstruction, and on a schedule of their own choosing, through the distribution of materials and technical support; and
- encouraging the adaptation of the reconstruction schedule to the agricultural calendar.

Selection of beneficiaries

Lack of capacity by the local government, combined with the large number of newly created organisations looking to help and 'adopting' random villages, made beneficiary selection problematic. Selection was also made more complex by the fact that some communities were displaced into local towns or large villages, but were still travelling back to their original locations every

day to tend their farms.

Tensions rose over the course of the response, due to the different levels of support given to communities affected by the tidal wave and those affected by the high winds. Additional tensions arose between communities who had made agreements with different aid organisations, which had different types of programme methodologies.

The NGO initially targeted the most vulnerable members of each village for the materials distribution, asking the local Rotary Club to work with the villages to select 20 of the most vulnerable households from each village, according to agreed-upon criteria.

Land rights / ownership

Affected communities were aided on their customary locations, although some agencies constructed shelters in the early stages of the emergency in grid patterns near the affected villages, without full consideration for land ownership questions. By December 1977, the local government was insistent that those who had fled to the towns or cities at the beginning of the emergency should be strongly encouraged to return to their villages and not remain permanently in the towns.

Technical solutions

Basic kits of traditional materials were distributed to the communities. It was recognised that in some cases distribution would have to be timed to take into account both the agricultural work cycle and the time needed to cure the bamboo for construction.



Shelter design elevation showing cross-bracing

The initial construction efforts were evaluated three weeks into the programme. Based on the evaluations, improvements and additions were made (cross-bracing and the protection of the housing posts below ground level) in the guidelines and prototypes.

Based on the interest of a wide range of shelter actors and the local government, an Appropriate Reconstruction Training and Information Centre (ARTIC) was established to give advice and conduct evaluations for the various ongoing shelter programmes. ARTIC was funded and supported by a loose consortium of major INGOs and local partners. ARTIC not only worked directly in

consultation with the various organisations, but also produced booklets on safer housing construction for local distribution.

The design of the model house that the NGO provided to the beneficiaries was square, with a pyramid-shaped roof of a 45-degree slope to be both wind-resistant and to allow water runoff from the palmyra thatch. A ring beam and aluminium strips to bind the joints were added to the cross-bracing. The wooden posts were treated for infestation and rot and were sunk 1m into the ground. The palmyra thatch was attached to the roof using traditional sewing methods, despite the sewing materials' lack of great strength.

The architect hired by the NGO felt that because parts of the roof had actually blown off, this had reduced the internal wind pressure and had saved the larger structure of many of these types of houses during the cyclone.

Implementation

Direct implementation was done by the families themselves, with technical assistance from local carpenters. The beneficiaries were also responsible for shelter quality and for any adaptations of their shelter. The NGO, and later ARTIC, provided technical information through direct field visits, training of local carpenters, the development of booklets and posters, and in one case the production of a short play to impart important construction messages.

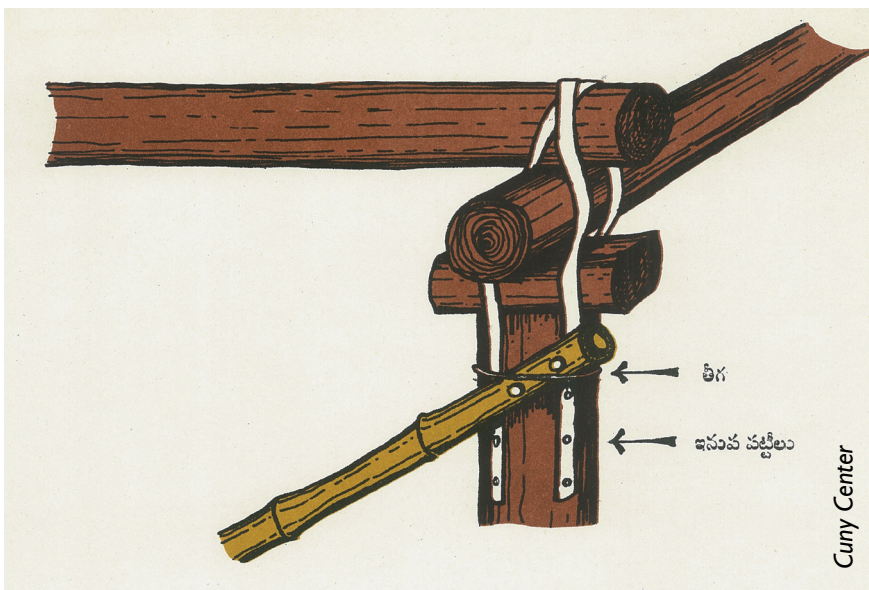
Logistics and materials

Similar sets of materials were initially provided by the local government in the first stages of the emergency. This delivery was taken over by the NGOs, and was augmented with the materials (bamboo, metal straps) necessary to make the shelters cyclone resistant. One of the arguments for delaying the reconstruction was that the materials used in traditional construction were strongest or best for use as construction materials. In the case of bamboo, this would have needed to be bought some weeks in advance and then cured before use.

Materials list

The following list shows the main materials provided and the ones that were of most value in the construction of adequate and cyclone-resistant structures.

Materials
Wood posts
Bamboo bracing
Wood roof frame
Palmyra leaf roofing material
Metal binding straps
Plastic sheeting (used to protect wood posts below ground level)



Connection detail