



Homes of hope

Community-led reconstruction in Kalimpong

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“Rather than doing it all ourselves or having everything done for us; things work best when there is equal participation of the community and the organisation.” – Ruth-Marie Lepcha, beneficiary



THE SHOCK OF A 6.9 SHAKE

"We have felt tremors since we moved here 35 years ago, but we have never felt an earthquake so strong."

- Mendo, widow and beneficiary

On the evening of September 18th, 2011, a 6.9 magnitude earthquake struck the border region between India and Nepal. The epicentre of the earthquake was 64 kilometres north-west of Gangtok, the state capital of Sikkim.

The earthquake left a trail of destruction to public, social and personal property. Though the death toll was not very high by Himalayan earthquake standards, the impact was huge for this remote and ill connected region and damage was extensive across Sikkim and adjacent areas of West Bengal. In fact, one family tells the story of how they were just outside their house when the earthquake occurred and watched as their walls crumbled in front of them. It was a miracle that they escaped unscathed.

Recurring landslides aggravated the situation and heavy rainfall and bad weather made the task of relief and rescue workers very difficult. Already remote, access to many areas was completely cut off and immediate humanitarian aid was unable to reach these isolated villages.



REACHING OUT TO THE MOST UNREACHABLE

Initially, CASA planned to support earthquake-affected families in Sikkim. However, a more in-depth assessment (and the fact that the Sikkim government has received central funding) turned them to the equally damaged, but almost totally ignored, damage across the West Bengal border.

Daunting treks took CASA staff and local partners deep into the hills of Darjeeling, West Bengal, as they searched for the worst affected and most needy families. In these remote locations, even news of extensive damage was spread only by word of mouth through local church networks and (in the most well-connected areas) through local media.

As immediate relief, 450 affected families were provided with family relief kits consisting of 5 blankets, 1 pressure cooker, Kitchen utensils, a bucket with cover, hygiene kits and Tarpaulin sheets. Families were identified on the basis of these first hand surveys in cooperation with local panchayats, village level committees and in consultation with the district government. Community participation began from this stage itself for identifying 16 most vulnerable and needy ones for shelter reconstruction assistance was no easy task. The positive outlook of the community was overwhelming. People were actually willing to recommend others who they felt were more in need!

Emphasis was placed on widows, women-headed households and physically challenged people; as well as homes that had received little or no assistance from the Government or other NGOs.



CREATING A HYBRID DESIGN

"The old system of ekra was also good, but adding concrete blocks has added strength against the water damage." - Jan Singh, mason and beneficiary

The extensive surveys revealed that modern reinforced concrete houses had sustained significantly greater damage than traditional 'ekra' construction. Also known as 'Assam type', this is a light-weight wooden framed structure with bamboo mat in-fills. These are then plastered with mud or cement.

With its inherent earthquake resilience qualities, maintaining traditional principles was seen as the most sustainable mode of reconstruction. In these remote areas, where transporting materials is highly difficult, it was also the most cost-effective and practical option. However, disaster resistant features were enhanced to upgrade durability in the face of another disaster.

At first, the idea was to strengthen the foundations, but to retain pure ekra for the superstructure. Yet the feeling among the community was that it shouldn't be the same house that they would have built themselves. Rather, beneficiaries in both villages asked for a small alteration adding ekra walls over a 30 inch high concrete block wall. This would help protect the ekra from the water scouring during the rains (which are pretty heavy in this region).

So the final shelter design was guided by four key principles:

- **Adaptive** to local conditions, practices and community
- **Upgradable** so that family needs may be fulfilled incrementally
- **Environment and eco-friendly** with green construction
- **Demonstrative** of good construction practices.



From traditional ekra with mud plastering and straw roofs... to a hybrid design

A secure and strong under-structure comprised of a Reinforced Cement Concrete foundation (appropriate to the prevailing soil conditions) and plinth beams. This not only ensures strong structural support against earthquakes and landslide threats, but will also support all future modifications and additions to the shelter.

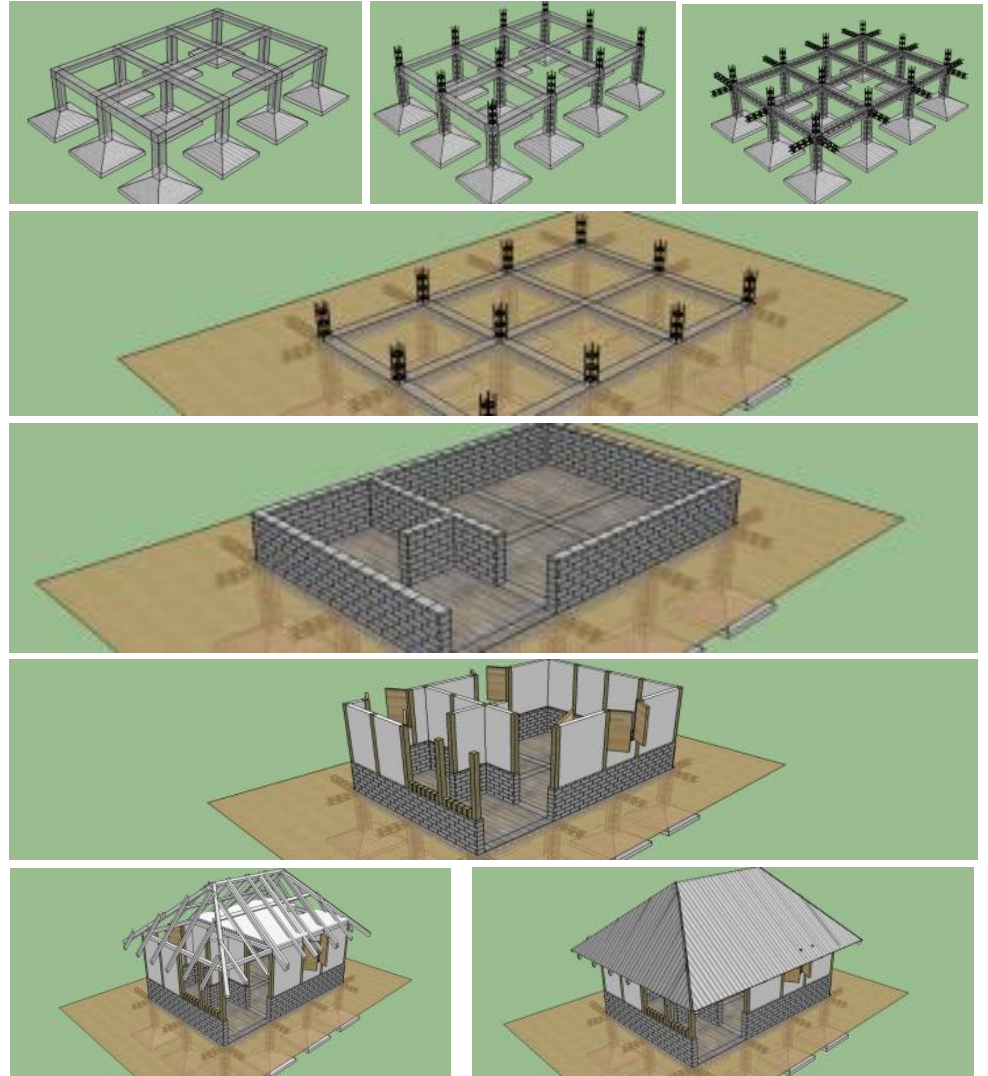
A stable and protected raised plinth on top of the RCC pillar and beam frame that assures stability and safety.

30 inches of brick blocks to protect the ekra walls from future flooding and heavy rains.

Appropriate ekra walling structures complete with sill and lintel bands that provide this shelter resilience against strong quakes and other future threats, at the same time keep the materials local and eco friendly.

A roof comprising of Corrugated Galvanised Iron (CGI) sheets on bamboo mats supported on a strong bamboo frame.

The designs took into account safety considerations such as seismic loads exerted in zone IV and prevailing wind speed velocities of 50 m/s.



The covered area of each shelter was planned as 31.28 Sq metres; well above the minimum floor area required for a 5-person family based on the Sphere standard of 3.5 sq metres per person.

With the use of local materials and technologies, the shelter was designed to be highly sustainable. Not only did it have a low carbon footprint, but also the thermal comfort indoors is high.

Vernacular construction practices were integrated and the design banked on locally prevalent materials and skills. This ensured that dependence on external support was not increased manifold through this intervention.

Perhaps most importantly, the modular design with calculated amounts of material ensured minimum wastage and sped up construction. In fact, it allowed breaking the structure into smaller components. This allowed for manufacturing of components off-site for fast assembly on the plinth at the homestead. This could be done using a small number of masons and made it viable for the project to involve active participation of the beneficiaries themselves – a core component of the project aims.





CONSTRUCTION AGAINST ALL ODDS

Beneficiary participation and procurement committees

“Jis ka ghar ban raha tha, hum log khud involved the. Ye acha hua. Hum ko kafi seekhne ko mila.” (The people whose houses were getting built were themselves involved. This is really good. We got to learn a lot.) – Tek Bahadur, procurement committee member

A Central Procurement Committee was formed to oversee the purchase, transport and distribution of materials. This consisted of local volunteers, beneficiaries and members of the implementing agencies (CASA and DISHA). In this remote location, this was useful as it allowed for planning for smaller head loads to be carried from a central point at the road head. Considering the long treks this required, checking the materials first was a necessity.

Joint procurement committee meetings were conducted twice – once in Kalimpong town and once in Pochuk to explain and debate the design and process. Smaller meetings within the two villages taught the members how to check and receive the materials.

It was decided that components like cement, steel, CGI sheeting and sand were to be transported from the nearest town; whereas timber, stone, aggregate and bamboo were to be procured locally by each family. Masons, carpenters and workers were also to be arranged by the community.



Pre-fabrication

"The notion of pre-fabricated houses and pillars was very new. People did have questions at the beginning, but then they understood and used them exactly as planned."

- Nalam Lepcha, local partner

Considering the location, a 'Shelter in a Kit' strategy was adopted. This meant that in these far flung areas, the design could be assembled on site within just 5-6 days on a stable foundation and using a minimum number of masons.

Pre-fabrication also helped ensure quality control. The pillars and beams were all produced at a central location in each of the two villages. This helped ensure that reinforcement binding, casting and curing happened as per standards. Training workshops for the masons and house owners facilitated quick learning on the techniques of assembling these components on site. A combination of modular technology, centralised fabrication, training and appointment of local monitors within the community helped ensure quick and high quality construction.

"The community is usually narrow-minded. They would complain about the cost of the foundation saying, 'karcha zyada aya zameen ke neeche' (the cost was greater under the ground); but they now understand its benefit."

- Songdem Lepcha, Volunteer



Building their houses themselves

"We used to make the houses ourselves in any case. This process was good as we got training and learned to make the houses safer and stronger." – Johann Lepcha

The communities also took the lead in the construction process. All able family members took part in material procurement, worked as masons, labour or electricians; while continuing their usual work in agriculture or animal husbandry.

Training programmes taught the people how to create the strong foundations, properly cure the blocks for maximum strength and put together the entire structure.

Innovation could be seen everywhere, including in the simple block making apparatus that were fashioned locally out of timber – single and in sets of three.

Local masons brought locally adept ekra skills to the table, though the original technique of the area was slightly changed. Usually, matured bamboo is cut and used directly without drying. This keeps it green and the stickiness of the sap allows the mud plaster to stick to it. This time, cement plastering was used so the bamboo was dried.

"I'm 52 years old and I've never seen help like this!"
– Tentshering Lepcha



Working through the monsoon

“The water shortages are usually so intense that people had to carry jerry cans up the hills in order to cure their blocks. In that way, the monsoon was a blessing.”

– Nalam Lepcha, Staff Member, DISHA

Expectations of a heavy monsoon onslaught after the summer of 2012 meant that the project timeframe had already been extended up to December. Yet, the spirit of the community and the strength of the local partners meant that work continued all through the monsoon rains! Everyone agreed that this would help secure and properly use the materials. Volunteers from within the community and from DISHA (Local partner) were initiated for day to day supervision of work. It was also decided that CASA staff will visit fortnightly to the area for monitoring of the progress of the work as well as to make necessary payments to the workers.

Money left over for extras!

The procurement through local vendors and community involvement significantly brought down the expected costs. For example, timber could be procured at almost half the market cost per cubic metre. This allowed for the provision of a little extra and each house was furnished with a solar panel. In this power-starved region, this was a much appreciated insight.



HOMES THAT SPURRED LIVELIHOODS

Through the course of the intervention, there was also scope to improve construction skills and gain additional livelihood scope. Daily household needs were able to be met from the wages which they earned during construction. This meant that the money that they earned from growing ginger and broomsticks could be saved. Ten families were actually able to open Fixed Deposits of Rs. 5,000 with Axis Bank, thanks to these savings! All the beneficiaries have also already planned to construct additional rooms to accommodate more family members.

In the village of Longcel, one young girl has spurred an inspiring story. A driven student and consummate achiever, Manju Bahadur (the younger of two sisters in this family) spends most of her time in Bakrakot (a town five hours away) since there is no high school nearby. Her elder sister Mamta is married and her parents are young grandparents in the village.

Manju had observed that in Bakrakot, several families earned additional income by setting up a shop. Using her own earnings from producing stone chips during the project, she has started a small shop for her parents. Once a week, they take the bus to a wholesale market in the closest towns to stock up on soaps, shampoos, candy and other small items. They can earn up to Rs. 300 a week. It has also been a boon for the community at large; for being able to access day-to-day items at close range is a really new phenomenon.

"Now we are looking at expanding the store further and adding more items to sell!" – Kamali Bahadur, beneficiary and store owner



INSIGHTS AND LESSONS

Varying sizes according to need

"People ask why do all the houses get built exactly the same and of the same size? Don't we need to vary it according to the family size and need?"

- Nalam Lepcha, DISHA staff member

The varying family size and need means that larger families have already begun to expand their houses. At the same time, the smaller room, which was designated as a kitchen, has been mainly used as a store. People have reverted to a makeshift kitchen outside which is slowly being built up as permanent one. Anticipating and incorporating such variation into the scope remains a challenge.

Greater training over more time for long-term change

"If you work like this involving the community, there is less chance of corruption. However, members need to be selected carefully. They need to really understand what they are doing, not just sign the paper."

As a local volunteer, Songdem Lepcha talks about some of the challenges. For example, twice the materials were dropped off on the main road, rather than at the closest point as instructed. Since this was a new concept, some of members needed more training in order to take on the responsibility and actually supervise day-to-day construction. This might have also prevented some of the deviations that took place from the original design. For example, most used nails instead of J-hooks. An on-site prototype model could have been constructed with the community that showed the techniques and addressed any challenges hands-on.



Simplifying technology for community-led processes

"We believe in community participation and catering to community needs, but we can't compromise on technical quality." - Ranjan Pandey, CASA staff member

The concept of pre-fabrication, in particular, was totally new for the community. Handling the heavy beams and joining the 16 reinforcement bars together at once was difficult for the community to handle. Simplifying the technology or having an engineer on-site throughout the entire process would be helpful for the next time.

Difficult terrain, difficult conditions

Maintaining time frames and schedules in these conditions was a real challenge. Some donor flexibility and understanding of the circumstances would be helpful in adapting to the changing on-ground situation from day to day.

An unbeatable community spirit!

"Such processes can only work when there is mutual trust and active community participation. Despite all the difficulties we expected, everything worked out so well."
- Ranjan Pandey, CASA staff member

