Background
On 15 August 2007, an earthquake of 7.9 on the Richter scale struck the Peruvian coastline with endless aftershocks and small tsunamis. The earthquake struck Ica, Huancavelica and Lima, however, the most significantly affected communities were Canete, Chinch’a, Pisco and Ica. The earthquake caused not just physical damage to houses, schools and community infrastructure but also the death of 593 people. 131,393 families were directly affected.

Although the rural areas of the entire province assessed suffered severe loss, with 90% of houses either totally or partially collapsed, the urban area that was most damaged was the city of Pisco where about 75,000 houses were made uninhabitable.

The coordinated action of the Red Cross Red Crescent Movement responded to the emergency needs of families, assisted vulnerable populations in the rehabilitation of their houses while improving quality of life and helped strengthen the Peruvian Red Cross.

A three phase programme
In times of disaster, the International Federation of Red Cross and Red Crescent Societies (IFRC) aims to save lives, protect livelihoods and strengthen recovery.

In Peru, the IFRC’s response and recovery operation occurred in three phases: emergency, early recovery and rehabilitation. The shelter response programme reflected these different stages of reconstruction.

The third phase of the operation was completed through a comprehensive participatory rehabilitation programme. Thus most activities were carried out involving the beneficiary families and PRC volunteers in order to build local capacities while implementing the programme.

It required concurrent action from the families, communities, cooperation agencies and Red Cross Red Crescent Movement. Activities took into account an environmental impact assessment, the opinion of community members and outcomes from regular operational team meetings. The most important achievement of the programme has been the change in the way community members interact and support one another. Individuals are now empowered to lead their own development.

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During the emergency, the combined action of the Peruvian Red Cross (PRC) and the IFRC provided emergency relief to 19,891 families, exceeding the original target of 7,500 families (37,500 people), with shelter and basic non-food relief items.

2
During the second phase of the operation, 6,308 transitional housing facilities were built by the Peruvian Red Cross, the IFRC and Partner National Societies (PNS) reaching 6,008 families (families with more than five members received two modules), of whom 1,028 were provided by the IFRC mainly in the province of Pisco.

3
In the third phase of the operation the International Red Cross and Red Crescent Movement rebuilt and repaired 36 community facilities such as health centres and schools. In cooperation with the beneficiary families, Red Cross Red Crescent built 761 seismic resistant houses for vulnerable families in 13 communities.
The affected communities faced two major constraints. First, the coastline experienced sudden temperature shifts with extremely high temperatures during the day and very low temperatures at night. These dramatic temperature shifts increased peoples’ health risks as they did not have roofs over their heads. Secondly, the lack of legal land title and undocumented occupancy of land was a major challenge. This was because the legal procedures to ensure land ownership as part of the government’s long-term recovery programmes took a long time.

Therefore, it was crucial to provide a fast-build, climatically adapted transitional shelter solution to enable better living conditions while reconstruction activities began.

Construction was carried out with the assistance of the beneficiary families. When a family had more than five members, additional materials were provided. Approximately 30,040 people were reached by the combined Red Cross Red Crescent’s efforts in this sector.

The structure of the shelters was made of timber tied together with very resistant plastic sheets to withstand the regular sand storms. The exteriors were made out of reinforced straw mats (a technology widely tested and improved by research centres) that provided shelter from weather conditions. The size of the modules was 6 by 3 meters and 2 meters high. The modules were designed and built to be dismantled and reassembled elsewhere if necessary, which allowed people who did not have a land title to be assisted though this programme.

The community played an integral role in building their own shelters, whether these were temporary or permanent.
The recovery and reconstruction phase was launched in early 2008 with the following objectives:

- Provide safe and secure housing
- Promote earthquake-resistant construction technologies
- Address families’ land tenure issues

The IFRC chose three implementing partners with recognized shelter expertise: Pontificia Universidad Católica del Perú (PUCP, national University), Emergency Architects (an international NGO) and PREDES (a national NGO). These organisations were able to build according to different design and construction technologies, as long as they contributed to the programme objectives stated above.

The provision of safe and secure housing required improvements in building components, namely the quality of materials, design and construction techniques. These techniques were based on indigenous knowledge and respected the cultural background of the population while making them disaster-resistant. The adopted earth-based methods were both environmentally friendly - as the preparation required low energy for production and produced minimum waste - and relatively low-cost in comparison to the equivalent of cement brick buildings. Furthermore, since the basic component of the walls was soil, they provide natural thermo-insulation from extreme temperatures.

Roles and responsibilities were defined as follows with PREDES, one of the implementing partners:

**Implementing partner**
- Organise the construction work (phases, material supply chain, labour, etc.)
- Handle logistics
- Technical supervision
- Capacity building of beneficiaries
- Planning and organising a participatory design workshop

**IFRC**
- Beneficiary selection
- Social mobilisation of beneficiaries to ensure full participation at all stages

**Beneficiaries**
- Identification of two people per family that will contribute to the construction of their house, provision of stones and sand for foundations, land clearing, reception and unloading of construction materials, making straw mats.

**Municipality**
- Facilitate transport by providing vehicles/trucks to offload construction materials on site
- Provide building permits for clusters of fifty houses

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**Houses built with improved adobe and structural bamboo with La Catolica University**

**Beneficiaries cutting straw which is mixed with earth to produce adobe blocks. Livelihood activities and skills development started.**

**Reinforced adobe blocks and bamboo construction with PUCP**

**Improved quincha construction with PREDES.**

**October 2008, pilot houses built in Toma de Leon were handed over.**

**June–September 2008, agreements with implementing partners are signed**

**August 2008, capacity building on permanent housing construction.**

**December 2008: construction of permanent houses starts.**

**Beneficiaries cutting straw which is mixed with earth to produce adobe blocks. Livelihood activities and skills development started.**
Materials and designs were tested at the Pontificia Universidad Católica del Perú (PUCP) laboratories to guarantee their seismic resistance. Techniques included:

- **Improved adobe reinforced with geogrid** used by the IFRC and the PRC in the district of Independencia (Pisco) and in the districts of El Carmen and Chinchu Baja (Chincha).
- **Improved quincha** used by the IFRC in Humay in Pisco; the Spanish Red Cross in San José de los Molinos (Ica) also used this technique in Independencia (Pisco).
- **An earth-cement block (ECB) technique** used in the district of San Clemente (Pisco).

The construction of safe and secure houses has allowed the local transfer and development of skills which beneficiaries will be able to use in the future to enhance the community capacity for disaster resilience and reconstruction. Training was integral to the programme and each family designated two people to work with the programme who were either members of the families or community members supporting a family unable to provide labour. After the acquisition of building technologies from IFRC partners, the communities themselves lead the building process with logistical, financial and technical support from the IFRC. Additionally, the IFRC led 29 courses and workshops for 997 beneficiaries. As a result, civil engineers, construction workers, local government personnel and architects have increased their knowledge in subjects such as seismic-resistant building.

Houses were equipped with water and electric installations, a sanitation solution (latrines) and an improved kitchen that consumes less fuel. It also emits less pollution as it has a chimney that prevents smoke from remaining inside the house and the design of the kitchen increases the heat-use efficiency. Cooking spaces are segregated from sleeping spaces, thus providing safer houses.

The construction process was challenged by difficulties accessing the target areas, so logistics and transport issues were solved with assistance from the communities and cooperation from suppliers. The total number of houses built by IFRC with its implementing partners is 592.

**“Two years after construction, some families have rented out their shelter or still use it as a small shop to make a living. Basically, people have kept them for different purposes. Over the months the word ‘shelter’ became one of the most popular words of the Peruvian coastline.”**

The coordinated work with the community ensured the success and sustainability of the people-centred reconstruction process.

**October 2009, a Participatory Programme Review (PPR) was carried out at final stage of programme.**

Capacity building workshops organised on earth-based technology used.

**MILESTONES OF THE RECONSTRUCTION PROGRAMME AND SHELTER PROVISION**
Addressing land and property

The housing programme included activities aimed at addressing the widespread land tenure issues. Workshops were carried out by the PUCP with the booklet series My propriety and I (Mi propiedad y yo—ISBN 978-612-45504-0-9) to provide guidance on the formalization of property ownership in rural areas.

A thousand copies were distributed among target communities and institutions working in housing rehabilitation in southern Peru. Part of the series was reproduced by the United Nations Development Programme (UNDP) for their workshops with municipalities around the country.

The IFRC and other members of the Healthy and Safe Housing Group worked together in developing new strategies to achieve a solution for holistic rehabilitation. They supported the development of a website that published lessons learned and documentation from the Peru earthquake. They also assisted the government and the national administration in the design of a voucher programme to support rural housing.

Rehabilitation: getting communities back on their feet

The reconstruction phase of the programme was a means, not an end in itself. The assisted self-help housing programme enabled community members to self-organize in the clean up of plots, the building of foundations, and the transportation of gravel and other construction materials. The construction process also enabled people to define their own priorities and provide mutual support to each other to that the most vulnerable were not left behind.

In addition to housing, the Red Cross Red Crescent Movement rebuilt 13 schools with support from the Belgian Red Cross, and repaired 19 schools in Chincha, Ica and Pisco with support from the Spanish Red Cross. The Spanish Red Cross also equipped ten schools with modern furniture and computer rooms and distributed 3,000 school kits. More than 60,000 students and teachers benefited from this support. Additionally, the Belgian Red Cross provided equipment for seven health centres. They also repaired one of the health centres and built a new maternity room in the centre. Four community centres were also constructed, two of them by the IFRC and the other two by the Spanish Red Cross.

In addition to the sanitation solutions delivered by the rehabilitation programme, the IFRC, in coordination with partner organizations such as the Peace Corps, provided training to communities in water and solid waste management. Targeted communities were also given support for growing green areas and planting trees. There is also an opportunity for the local Peruvian Red Cross branches to continue risk reduction-related training in line with Strategy 2020, the framework guiding the IFRC in its goal of increasingly saving lives and changing minds in the next decade.

Beyond reconstruction: improved quality of life

The IFRC worked alongside the communities to support livelihoods and address endemic problems. Since the beneficiary families’ economy depended on seasonal agricultural activities, the programme helped provide them with a supplementary source of job income from construction and other activities. The IFRC introduced home-based activities for women and supported 13 workshops in handicrafts, bakery and domestic business management for 338 people. Working in partnership with community leaders, local authorities and other cooperating organizations, the IFRC also supported local fairs and monthly markets promoting goods locally produced.

The programme created a ‘domino effect’ as the activities also impacted families that were not directly assisted by the programme. For example, all community members now benefit from the vibrant public spaces and social infrastructure that was not in place before.

In another example, communities previously faced common problems removing debris in the streets as local authorities were not able to cope with the scale of the solid waste. In response, the community decided to recycle the waste in a creative manner: roads reinforced with earthquake debris have been created on the outskirts of town where only sandy slopes existed before. This has improved access to these areas for elderly and children who were not able walk on the sandy slopes into town before. Another initiative is now underway to reuse old adobe bricks to pave pedestrian paths.

The recovery operation has also helped to enable the legal registration of pre-existing community organizations and their capacity building. For example, local women’s associations and water distribution committees have participated in training sessions on teamwork, meeting management, leadership, collective decision making and formal note taking. As a result, more than 3,600 people are working together in the communities to clean and recover community spaces for collective social purposes.

Houses built with improved quincha in Bernales with PREDES
In the early recovery phase, it is good practice to define a community introduction protocol where the roles and responsibilities of each party are defined, and expectations are discussed and agreed upon.

The use of well-established local partners is a way to secure a project’s sustainability and replicability. The combination of NGOs with construction expertise and a National Technical University have allowed knowledge transfer to local communities. Clear memorandums of understanding on construction monitoring and supervision are necessary.

Assisted self-help projects are based on the idea that in times of disaster, people in the local community play an integral role in building their own houses, but that they need financial resources to successfully rebuild, as well as qualified technical expertise to make their homes disaster resistant. Quality control is assured with constant monitoring and project supervision.

Improved indigenous technologies can be low-cost and environmentally friendly. These technologies also enable people to acquire knowledge on how to build safer houses.

A holistic approach to settlement reconstruction entails much more than just construction. The approach must also consider land ownership, legal status, community services and the development of public spaces.

Although shelter clusters were not formally activated, the IFRC took a proactive role in promoting institutional collaboration, inter-agency coordination and policy development. This helped to ensure an equitable reconstruction process to serve the needs of the most vulnerable.

For the Red Cross Red Crescent, reconstruction means much more than providing the house keys and saying goodbye. It means that a family feels ‘reconstructed’ after losing it all: it means feeling useful and self-confident after going through pain and fear, re-establishing confidence in the community they live in, connecting with neighbors and relatives, and having the sense of a brighter future for their kids and bringing them them up in a safe environment. This is what the community of Bernales was aiming for and was willing to fight for.

Resources

For more information on the IFRC shelter and settlements programme, please contact:

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