CASE STUDY

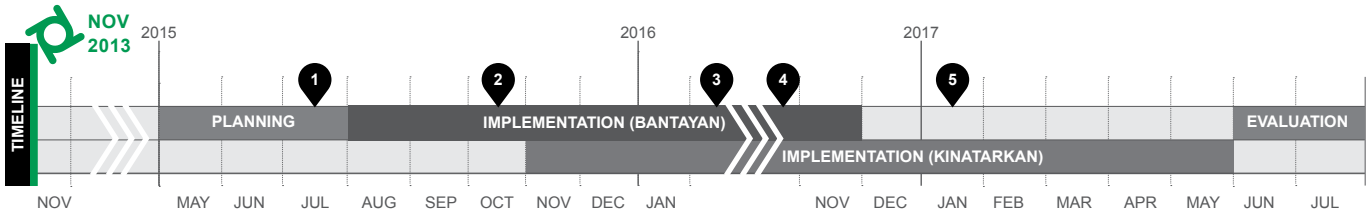
PHILIPPINES 2015–2017 / TYPHOON HAIYAN

KEYWORDS: Core housing, Disaster Risk Reduction, Construction techniques

CRISIS	Typhoon Haiyan (Yolanda), 8 Nov 2013
TOTAL PEOPLE AFFECTED	**3,424,593 households** (16,078,181 persons)
TOTAL HOUSES DAMAGED	**1,012,790 houses** (518,878 partially damaged and 493,912 totally destroyed)
PROJECT LOCATIONS	Municipality of Madridejos on Bantayan Island and Municipality of Santa Fe on Kinatarkan Island
PROJECT BENEFICIARIES	**1,200 households** (6,480 individuals, 52% female)
PROJECT OUTPUTS	**1,200 core houses and sanitation facilities** **380 workers** engaged in the construction process (including 36 master trainers and 288 workers trained) **234 workers** obtained a TESDA certification **260 workers** participated in a workshop on safety and rights in the workplace
OUTCOME INDICATORS	**90%** of beneficiaries implemented safe construction techniques **80%** of craftsmen applyed the skills acquired in the training
SHELTER SIZE	**17.5–21m²** for the core living space (24m² including bathroom)
SHELTER DENSITY	**3.5m²** per person (average household size of 5.4)
MATERIALS COST	**USD 2,642** per house (including bathroom and sanitation system)
PROJECT COST	**USD 5,160** per household

PROJECT SUMMARY

The organization targeted 1,200 of the most vulnerable households on two islands in North Cebu hit by Typhoon Haiyan. It provided long-term earthquake- and typhoon-resistant core houses through a cash-based and owner-driven approach. Houses were made partly of timber and partly of interlocking compressed earth blocks (ICEB) procured from local suppliers. The project provided training in disaster risk reduction measures, safe construction techniques, financial and project management, thereby strengthening community cooperation and support mechanisms.



1. Jul 2015: **Pilot phase completed. First 15 houses and 6 model houses built on Madridejos, training of trainers and workers conducted.**
2. Oct 2015: **Review of model houses.**
3. Feb 2016: **Materials procurement and transportation completed.**
4. Oct 2016: **Construction of 593 houses on Bantayan completed.**
5. Jan 2017: **Construction of 607 houses on Kinatarkan completed.**

STRENGTHS

+ High beneficiary participation with an efficient support and monitoring system.
+ The conditional cash transfer approach, the flexible house design and the inclusive implementation process empowered beneficiaries and fostered a sense of ownership.
+ Effective targeting process and do-no-harm approach.
+ The project was multisectoral and addressed crosscutting issues.
+ Cost-effective, durable, structurally safe and comfortable construction technique.

WEAKNESSES

- Small scale project compared to the level of needs.
- Some families could not finance the transport of materials, so the organization had to cover the costs.
- Many households could not extend their houses with good-quality structures.
- Some families needed a lot of support and monitoring in the construction process.
- Professional logistics and procurement expertise was recruited late.

For an overview of the situation before and after the disaster and the national shelter response, see A.23 in Shelter Projects 2013-2014 and A.8 in Shelter Projects 2015-2016.

SITUATION AFTER THE TYPHOON

Many international humanitarian actors responding to Haiyan focused on the islands of Leyte and Samar. However, within the three municipalities of Bantayan, Madridejos and Santa Fe in northern Cebu, 93 per cent of the houses were either totally or partially destroyed, due to their poor workmanship and maintenance. Even though the population was exceptionally resilient and proactive in rehabilitating their houses, many people lacked the financial means and the technical know-how to rebuild without external support. Insecure land tenure rights, as well as very limited livelihood options, made it even more difficult for vulnerable families to recover. Almost three years after the typhoon, only about one per cent of the government housing for people in coastal danger zones had been achieved, and none had been initiated in the target areas.

PROJECT IMPLEMENTATION

Many houses in the project locations were irrevocably damaged. As such, although repair and retrofitting would have reached more people than building anew, it would not have been very effective. Therefore, the organization decided to focus on the most vulnerable and build 1,200 core houses with sanitation facilities on two remote islands: Bantayan and Kinatarkan. The project was implemented with conditional cash grants and close technical coaching of the beneficiaries, including both theoretical and on-the-job trainings in earthquake- and typhoon-resistant construction techniques.

The project team was composed of an international technical delegate supported by a local project manager (architect) and a local construction manager (engineer), plus four local field engineers. A local WASH team implemented the sanitation components of the project. A social team was also recruited including a social delegate and a team of four community mobilizers. The technical and social teams were supported by a chief delegate and a finance and administration delegate.

The targeted households led the construction of their own house, including the procurement of some of the materials, the hiring of workers and the supervision of works. In many cases, women managed the construction, since men were usually working elsewhere. The organization supported the beneficiaries with bulk procurements, financial and management training, monitoring and the establishment of bank accounts. Each barangay was split into groups of 7 to 10 households, based on their geographical proximity. The groups worked together, shared information and gave each other support throughout the construction process.

The cash grants for materials and labour costs were split into four tranches worth 10–35 per cent of the total construction costs and transferred to the beneficiaries' bank accounts after all members in the group had reached the same construction step and certificates of completion were issued. This reduced financial management burden and ensured mutual support between group members. Five per cent of the total amount was disbursed after all works had been completed. The workers were supported and supervised by master trainers and field engineers, who gave practical support and monitored each stage of the works. Once all construction stages were completed, a final inspection was conducted.

CORE HOUSES

Two basic core house options were selected, both developed on locally rooted, simple and cost-effective designs that beneficiaries could choose from:

- Hybrid structure made of ICEB (Interlocking Compressed Earth Block) and timber;
- A full-timber structure.

Mostly for durability and aesthetic reasons, all beneficiaries chose the ICEB-timber version. This was a cost-effective construction method (only USD 60 more costly than the timber house), structurally more resistant and environmentally friendly than other building methods, and using locally available materials. The decision to use the ICEB technology was mainly based on structural safety and durability considerations and was verified by engineering calculations. The model met the specific requirements of the donor on spatial standards and safety (from earthquake and typhoon), while keeping the costs as low as possible.

The design was developed from a common rural house – which usually includes a main private room and an adjoining room used as communal space – and was flexible to allow people to make extensions or adjustments according to their needs (e.g. the design and position of the windows/doors/porch). In compliance with national regulations on accessibility, adjustments in construction were provided when a family member had a physical disability.

A year and a half after the typhoon, many houses were in very poor structural conditions. For this reason, repair and retrofitting assistance was not an option, although this would have reached more people because of the lower costs.

The project provided core houses with light-weight extensions, based on a common rural design. The houses included a gutter and a water tank for rainwater collection.

The construction was owner-driven and implemented via conditional cash transfers. People could choose between a full-timber house or a hybrid ICEB-timber structure.

TARGETING

Prior to the start of the project, the organization conducted a comprehensive mapping of the target area and existing actors. The selected barangays were not covered by any other actor and were mainly rural or peri-urban, which was in line with the housing design chosen by the organization. Within the targeted communities, the organization provided shelter to 29 per cent of the population and covered the most vulnerable households in the areas.

COMMUNITY ENGAGEMENT

Reconstruction committees were established to provide feedback and inputs throughout the project. On Bantayan Island, communities used weekly listening desks and feedback boxes. On Kinatarkan Island, the organization conducted community meetings and periodic feedback meetings with the beneficiaries to address construction issues and concerns.

The committees were also responsible for community-wide projects, implemented in the target areas with the aim to reduce community tensions between the housing beneficiaries and the rest of the population.

The combination of the people's involvement in the construction process and the cash modality led to the substantial reduction of construction time per house (three to four weeks) compared to initial estimations based on organizational benchmarks (six weeks).

LAND TENURE

Most households had no legal status or proof of ownership. To address this, the organization contracted a local development NGO with extensive expertise in solving land rights issues for fisher folk communities. The NGO developed a land tenure map and supported over 1,000 households in securing proof of ownership or by creating usufruct agreements with the landowners for a minimum of ten years. Households located in an unsafe zone – or where no agreement with the landowner could be reached – were supported for relocation to host families or smaller group resettlements in communal or private plots identified by the local stakeholders. The regular exchange with the local government was also important for the clarification of land issues.

As part of its exit strategy, the organization contracted an environmental NGO which developed a legal training to help families secure their land rights after the expiration of the usufruct contract.

TRAINING AND DRR COMPONENTS

Thanks to the training component, unskilled workers gained additional skills for future livelihood opportunities. 234 construction workers obtained a certification through a widely recognized national organization. To qualify for the certificate, the workers had to contribute to the construction of several houses and participate in the training for at least six months. In addition to the certificate, workers received a construction starter toolkit and participated in an entrepreneurship seminar. More than 80 per cent of the trainees obtained this certification and could thereby improve their job opportunities beyond the project. Furthermore, 72 per cent of the community members who implemented additions to their houses considered the safe construction techniques taught in the training.

Based on an international study on Disaster Risk Reduction and Management, the organization carried out a stakeholder consultation on Bantayan Island. A wide range of DRR measures were suggested to increase the resilience of the communities, some of which were adopted for the project (e.g. the Safe Shelter Awareness trainings organized for all community members).

TECHNICAL SOLUTIONS

According to the calculations of an independent engineer, the core structure of the house was expected to last a minimum of 20 years and was built to resist seismic loads of up to 7.2 on the Richter scale and up to 200km/hr wind load. The buildings fulfilled the requirements of the National Structural Code and took into account a safety margin for construction skills and management. While tests were conducted on the materials, a full-scale test of the house performance was not done.

The compressed earth blocks had a ratio of 90 per cent limestone to 10 per cent cement. Widely spread in the region, this technology was already in use in the Visayas prior to the project. It can achieve high strength without requiring specialized skills and resources. The blocks were also very cost-effective, being produced mainly with local materials.

The adjoining room was made of lightweight materials with a coco-lumber structure and amakan walling. Termite treatment and protection of the coco lumber were critical to ensure durability. This part was also designed to be typhoon- and earthquake-resistant, but was expected to last less than 10 years. The coco lumber and walling could be easily replaced or adapted. In fact, many families changed some of the design or built extensions for small kitchens and dining areas.

MATERIALS AND SUPPLY

Materials were mostly procured directly by the beneficiaries, who organized themselves into groups for joint purchases. However, the ICEB blocks and other materials needed in big bulks (sand, gravel) were purchased by the organization, who negotiated with suppliers in order to fix best prices and to ensure adequate supply. Due to the limited capacity of some of the supply companies (especially for coco lumber), the organization put the families in touch with new suppliers. This ensured timely delivery of materials and spread the benefits through the local market. The organization's engineers conducted quality checks of the purchased material and advised the households to pay the suppliers only once all materials had been delivered in the required quality.

The activities on the remote Kinatarkan Island required a more complex and costly logistics set-up than initially planned, as no transport facilities, electricity nor hardware stores were available. At the time of preparing the project, the organization had an agreement with suppliers to deliver the materials to the island. However, once the companies realized the cost implications, they pulled out, so the organization had to organize transport and distribution on the island on its own. This included the construction and management of a warehouse, a makeshift jetty and specialized maritime transport solutions, causing delays and requiring increased resources. Additionally, some beneficiaries were not able to cover the transport costs for the materials, and the organization had to increase its contribution.

A significant challenge was the official ban on coco lumber and limestone, which resulted in shortage of supply and increased costs of the two main construction materials. Additionally, one of the main suppliers of ICEB went bankrupt halfway through the project, so the organization had to search for a new supplier. Although these challenges caused delays, the project was completed within the overall timeframe.

A "Beneficiary Guide and Construction Handbook" with 3D drawings was used to show the households how to build their new house.

Courtesy of the organization

The adjoining room was made with a structure in coco lumber protected with a termite treatment, and an amakan walling. This could be replaced or re-design, so some families could built extensions for small kitchens and dining areas.

EXIT STRATEGY

As this project was the last for the organization in response to Haiyan, the phasing out was planned gradually for one barangay after another. Project staff were trained to increase their chances to find another job. The certified training component and the links with local organizations (especially with regards to legal advice for land tenure rights) also contributed to a smooth exit.

Additional employment support for the workers was provided through their organization into groups and the linkage with a local construction workers' NGO. This NGO advocated for issues related to workplace safety, rights and minimum wages, whilst supporting the workers to sign contracts within their communities. The lead organization facilitated this linkage and coordinated the establishment of local chapters of the NGO at the municipal level.

WIDER IMPACTS OF THE PROJECT

The knowledge and skills gained by the trained workers, beneficiaries and the larger community contributed to the construction of safer houses and were expected to continue to do so in the future. Assessments showed that around 80 per cent of the local workers applied the knowledge acquired in the training courses in other work. The skills also increased the local adaptive capacities within the community and led to improved job opportunities. As a result, the project contributed to empowering people, improving their livelihoods and fostering a sense of pride and self-worth.

The project also improved beneficiaries' land tenure security. Beyond the target households, the organization initiated procedures to clarify the rights of groups whose land was claimed by large landowners. After termination of the project, the Department of Agrarian Reform took over this responsibility.

Finally, as a result of the successful use of the ICEB technology in the project area, the national government also began to consider the promotion of this building technique for its reconstruction projects.

STRENGTHS, WEAKNESSES AND LESSONS LEARNED

STRENGTHS

+ High beneficiary participation, combined with an efficient support and monitoring system, resulted in high productivity and decreased the construction time.

+ The conditional cash transfer approach – coupled with training and technical assistance – **empowered the beneficiaries** who could manage the construction themselves. **The flexible house design and inclusive implementation process also fostered a sense of ownership** and commitment among the beneficiaries.

+ The most vulnerable households in very remote locations were reached thanks to an **effective targeting process.** Community involvement and the focus on do-no-harm principles **minimized conflicts over the provision of houses** to only the most vulnerable families.

+ The project was multisectoral and **addressed various crosscutting issues** (land tenure, gender, capacity-building, livelihoods, water and sanitation) to ensure its sustainability through the combination of both "hard" and "soft" components. This was also possible thanks to a **strong partnership with civil society groups and local organizations.**

+ The hybrid construction system was **cost-effective, durable, structurally safe and provided a comfortable living environment.** It was chosen by all the beneficiaries.

Core houses were built to resist typhoons and earthquakes and have an expected lifespan of 20 years for the core and 10 for the extension.

WEAKNESSES

- The project could only reach a relatively low number of beneficiaries compared to the needs (29% of the total affected population in the targeted municipalities and about 0.12% of the total in the country), mainly because of its high costs. However, the project covered 100 per cent of the most vulnerable households affected by Haiyan in the project area.

- Because of lack of financial resources, **some beneficiaries were not able to finance the transport of the building materials,** causing the organization to increase its contribution for transport costs.

- Many households were not able to extend their houses with good-quality structures, due to their limited financial means. Though they did apply the safe construction techniques learnt in the trainings, they were unable to use stronger materials and techniques that implied high costs (e.g. concrete). For some, even the maintenance or finishing works on the house – such as painting and protective coating – was limited to the exterior wall.

- Although the project intended to be owner-driven, **some families needed a lot of support** for monitoring the workers and the house construction process, and more encouragement to make design decisions about their house, based on their particular needs and wishes.

- Professional **logistics and procurement expertise was recruited late.** This was needed from the outset, considering the high logistical challenges encountered.

The project was implemented on a remote island, which caused several logistical challenges, especially after suppliers decided not to deliver to the island.

LESSONS LEARNED

- **The formation of groups of families** who built their houses together resulted in positive outcomes in terms of production, quality, community cohesion and solidarity.
- The transfer of knowledge through a **combination of technical assistance, theoretical and on-site practical trainings and close monitoring** was important to ensure effectiveness and a real enhancement of capacities. Trainings should be linked with livelihood opportunities and, where possible, the **collaboration with local associations and/or national technical training institutes** should be encouraged, to open opportunities for workers.
- **Comprehensive feedback mechanisms** with an effective response management demonstrated the importance to not only focus on the outputs, but also on the approach and the processes.