

Project

Project name

Country	<b>Viet Nam</b>
Region/town	<b>Dak Koi commune, Kon Ray District, Kon Tum province</b>
GIS data (WGS 84)	
Project type	<b>Post-disaster reconstruction</b>
Typology	<b>Individual housing</b>
Approach	<b>Self-help / contracted construction</b>
Beneficiaries	<b>Local population affected by typhoon Ketsana 2009</b>
Climate	<b>Tropical</b>
Special constraint	<b>Storm / flood</b>
start / end of project	<b>15.12.2010 – 30.10.2011</b>
Country GNP	<b>USD 650 / cap in 2005</b>



### Partners

Organization (donor)	Swiss Red Cross (Swiss Solidarity)
IO/NGO partners	Vietnam Red Cross (VNRC)
GO partners	Dak Koi Commune, Kon Ray District, Kon Tum Province

### Context to project

Initial Situation	In September and October, 2009 Kon Tum Province had been hit by both typhoons Ketsana and Mirinae and earlier tropical depressions, but damages by Ketsana were strongest. The most affected districts in Kon Tum are Dak Glej, Kon Ray and Tu Mo Rong. 50 people are reported dead while 409 houses have collapsed, 1.312 others are without roofs, damaged or flooded. Agricultural damage is also high with 3173 hectares of rice fields flooded. A great amount of local roads and bridges have been damaged leaving some of the communes inaccessible by vehicles for weeks.
Goals, Beneficiaries	The goal of the project was to reconstruct 40 destroyed houses in the typhoon affected villages of Dak Koi commune of Kon Ray district. Besides housing reconstruction the project included a component for recovery of lost economic assets livelihood recovery component for 400 households as well as improvement of health conditions of the villagers through improved access to safe drinking water, sanitary latrines and hygiene promotion
Implementations / Results	40 houses complete with a sanitation annex (septic tank latrine) were built as per plan and handed over to the beneficiaries by July 2011. 420 households in the same villages received financial support to replace lost economic assets. Piped water supply to main village rehabilitated, 27 additional household latrines constructed, hygiene promotion campaigns successfully held.

### Reference data (comparative)

Land plot (per house unit)	Min 150 m <sup>2</sup>	Garden	Approx. 95 m <sup>2</sup>
Ground floor (incl. walls)	55.0 m <sup>2</sup>	Floor (incl. walls)	55.0 m <sup>2</sup>
Occupants max.	6 persons	Occupants min.	2 persons
Total house area	35-40 m <sup>2</sup> (excluding sanitary annex)	Surface / occupant	+/- 6 m <sup>2</sup> /cap
House volume (outside dimension)	140 m <sup>3</sup>	Volume / occupant	+/- 23 m <sup>3</sup> /cap
Number of rooms	2-3 rooms	Occupant / room	0.5 cap/room
Heated area	na	Heated area/occupant	na
cost /unit	5'495 USD (including sanitary annex)	cost/occupant	916 USD/cap
cost/m <sup>2</sup>	135 USD/m <sup>2</sup>	cost/m <sup>3</sup>	39 USD/m <sup>3</sup>
Total housing cost	5'554 USD	Self help (beneficiaries)	68.3 USD/cap
Community development projects cost	206'400 USD	Comm. Dev. cost/occupant	860 USD/cap

### Approach to results

#### Initial Situation

Private houses were completely destroyed or damaged in a way that they couldn't provide safe accommodation anymore. Rural population with limited means for self-help (the most vulnerable: elder people, single mothers, families with many children, poor community members, families with completely destroyed houses) suffered the most from the impact of the typhoons. For several reasons these people couldn't provide themselves with shelter.

#### Approach

The house construction was carried out with a participatory approach to ensure a strong acceptance among the beneficiaries. The project team organized workshops in order to allow the beneficiaries to contribute to the design of their houses. Two different house designs each in two different sizes were developed. Within the basic designs individual adaptations and preferences were possible according to beneficiaries' ideas and needs. Families up to 3 members were entitled to get a 45 m<sup>2</sup> house and families with 4 and more members 55 m<sup>2</sup>. This included the toilet, shower and kitchen with around 10 m<sup>2</sup> depending on the design. The size of the houses was fixed on the base of the common building cost in Kon Tum province in comparison with the expected budget ceiling.

The house design is including a day area (open space for living); cooking area; night area (bedroom); outside hygiene area; outdoor living area (veranda). In terms of construction material the houses show little variation to the traditional houses in the project area with the exception of the stronger and storm-proof way of construction: walls are built of red clay bricks, with a stone masonry plinth, a wooden roof truss, red clay roof tiles and metal windows/doors. Due to the strong involvement of beneficiaries and the community the house design meets the cultural, social and physical requirements of the residents.

The houses were constructed with a focus on storm safety. Especially the foundations were improved by increased depth as well as an additional ring beam and the wall thickness was doubled compared to traditional building habits, not least for temperature regulation purposes. The connections between roof and walls were strengthened by connecting the different construction parts with steel bands.

The house designs and especially the aspect of storm safety took inspiration from the following house design handbooks recently developed for the improvement of houses under storm conditions: "House design handbook European Mission/ Development workshop France" and most important by the "Handbook on Good Building design and Construction of the UNDP International Strategy for Disaster Risk Reduction", both of which were already available in Vietnamese language.

**Problems/Constraints**

The project area was difficult to reach as the dirt road leading to the valley had also been destroyed by the flood. In order to conduct the project an auxiliary bridge was built to transport construction materials across the river. During rainy season transport was interrupted repeatedly.

The area is inhabited by ethnic minorities. The local government considered them as lazy and backward. To work in a participatory way seemed difficult at first. However, the generally expressed doubts whether the beneficiaries would contribute to the work was unfounded in the end. Their cooperation was very good and they clearly appreciated the opportunity to take ownership, in spite of initial hesitations.

The ethnic groups initially had expressed the wish to have their houses rebuilt in the ancient style, out of wood. Currently almost no such houses can be seen in this specific project area. An initial calculation showed that the price of wood was unaffordable by any standards. The area had been the scene of remorseless logging and only very small patches of forest remain. The project however temporarily used the traditional meeting house as a storage space and contributed some funds afterwards for its rehabilitation.

**Lessons learned**

The direct construction with beneficiaries supported by local craftsmen was possible even in this remote area. However due to the very remote area the implementation costs were much higher than in comparable projects because of the difficult material transport.

The additional hygiene and livelihood components proved beneficial to address the needs of the entire community and not only of those who had lost houses in the disaster.

The comparatively high quality of the houses sparked many discussions, not actually at population level, but rather among other Red Cross construction projects. The quality was seen by many as being too high compared to the population's living standard. In hind sight the SRC agrees to some extent and would most probably choose a simpler design under similar circumstances. Nevertheless, the houses are safe, provide good living conditions under the extreme climate (heat, long rainy season) and will withstand heavy storms.

**Evaluation**

100% of the houses have been constructed as planned and their quality was found very good during the post-construction assessment. All beneficiary families were satisfied with the project results and had taken full ownership of the houses.

**Legal framework**

**Politically attached to**

Kon Ray District, Kon Tum Province

**Type of ownership**

Completion (handover) certificate to each beneficiary; all plots and houses are property of the beneficiaries



## Construction information

### Construction

<b>Structure</b>	Foundations	Rock foundation with foundation bracing beam
	Walls or columns	Double brick wall
	Facade	Plastered and painted
	Roof	Wooden tiled roof
	Typhoon protection	Deeper foundations. Double wall thickness. The roof connected to the wall bracing beam. Four small beams hold the tiles firmly.
<b>Materials</b>	Floor surface	Paved with ceramic tile
	Walls	Outside wall constructed with double brick, inside wall with single brick
	Doors	Glass metal door
	Windows	Glass metal window
	Ceiling	No ceiling available, done later by beneficiaries
	Thermo insulation	No
	Roofing	Wooden tiled roof
<b>WatSan</b>	Water	Equipped pipe and taps for separate use
	Toilets	Toilets are connected to septic tanks
	Waste water	3 chamber septic tanks provided in individual plots
	Rain water	No
<b>Equipment</b>	Heating system	No
	Electricity connection	Connected by beneficiaries
	Telephone connection	No connection
	Cooking facilities	Kitchen place provided

**Total**

**100%**

## Urban planning

<b>Distance to</b>	Health centre	In average 15 km
	Education facilities	In average 2 km
	Income activities	Mainly farming
	Public transport	No

### For further information

Involved SHA construction group consultants	
Other involved SHA consultants	
Author / Contact:	Juerg.frei@redcross.ch
Recommended Institutions:	
Recommended partners:	
Recommended books/reports:	
Relevant other projects (links):	
Annex	



Relevant illustration





