

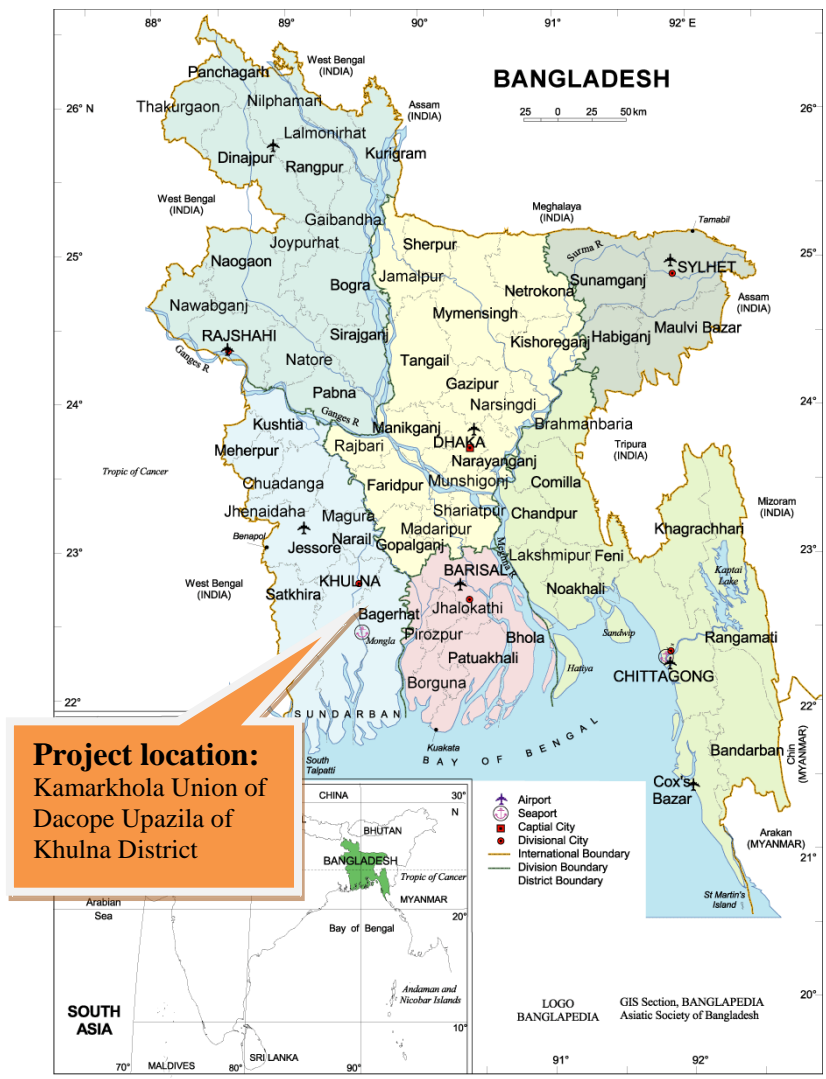
Owner-Driven Housing Reconstruction, Khulna, Bangladesh

Implementing agencies :	Bangladesh Red Crescent Society (BDRCS) http://www.bdracs.org/home.php (accessed: September 2013)
Technical support by:	International Federation of Red Cross and Red Crescent Societies (IFRC) http://www.ifrc.org/ (accessed: September 2013)
Donor:	Hong Kong Red Cross Society http://www.redcross.org.hk/en/disasterrelief_prepared/international_projects/ip_appeal_update_detail.html?year=2009&id=409 (accessed: September 2013)
Context/Crisis:	Cyclone Aila, 2009
Location:	Dacope sub-district, Khulna district, Bangladesh
No. of houses:	155 new houses
Cost:	BDT 52,853 (about US\$652) excluding additional investments by beneficiaries
Type of post-disaster project:	Owner-driven reconstruction of housing destroyed by Cyclone Aila
Date completed:	July 2013

1. Context of the Project

Cyclone Aila struck the coastal areas of south-western Bangladesh on 29 May 2009, less than two years after the extensive devastation caused by Cyclone Sidr. More than 3 million people were affected in this densely populated country by the huge cyclone that impacted 11 coastal districts. In addition to the impact of very strong wind, a storm surge of more than 6 metres caused widespread devastation. Nearly 200 people were killed, thousands injured and displaced, and nearly 550,000 houses were destroyed or damaged (BDRCS, 2011; Hong Kong Red Cross, 2009).

The low-lying coastal plains of the vast riverine delta of Bangladesh were protected by dykes built since the 1960s. Mostly made of piled and compacted earth, the dykes were weakened by successive cyclones and human interventions for aquaculture, particularly shrimp farming. Since the recent Cyclone Sidr in 2007, very little maintenance was done. Thus when Cyclone Aila hit, many sections of the dykes collapsed or were breached, causing extensive inundation by saline water. Many communities took refuge on parts of the dykes that were still above water and lived in makeshift shelters without basic services for more than two years. Due to the delay of the government to repair the dykes, a capital-intensive process presenting obstacles in this resource-strapped country, the widespread inundation impeded reconstruction during this extended period. Even after repair, some sections of the dykes collapsed again, causing further delay.



Some of the most severely affected areas were extremely remote and even in normal conditions were difficult to access. Dacope sub-district (*upazila*) in Khulna district was such an area, which was also among the most affected areas. Thus while BDRCS and other agencies provided relief and other support, the actual reconstruction could only begin in late 2011 after the dykes were repaired.

(Fig. A: Map of Bangladesh showing location of Dacope sub-district)



(Fig. B: A view from Dacope showing its low-lying coastal environment)

2. Basis of Selection

In a context where most post-disaster housing reconstruction tends to be donor-driven, this project represented a unique example of owner-driven reconstruction. Its location was very remote and vulnerable, and therefore it offered lessons on project implementation in such difficult contexts.

In this project, housing was integrated with a range of community infrastructure and other components, thus extending beyond only housing reconstruction. This integrated approach also offered valuable lessons on how to address the diverse needs of a disaster-affected and vulnerable community.

3. Agency Roles

The international Federation of Red Cross and Red Crescent Societies (IFRC) received US\$ 0.45 million funding from Hong Kong Red Cross Society, which in turn funded the Bangladesh Red Crescent Society (BDRCS) to implement the project.

BDRCS implemented the project with the help of 25 volunteers, some of whom were from the community and others from BDRCS's registered volunteer roster. Technical support was provided by BDRCS-IFRC engineers, and training on housing and community infrastructure was provided by BDRCS and IFRC staff. Beneficiary selection was guided by the Vulnerability and Capacity Assessment (VCA) tool and also the local government authorities assisted in beneficiary selection.

<i>Key Project Professionals</i>	
<p>MD. Adith Shah Durjoy <i>Manager-Humanitarian Response and Preparedness</i> <i>IFRC Dhaka</i></p>	<p>Mannan Ali Shaikh <i>Youth Volunteer</i> <i>Bangladesh Red Crescent Society (BDRCS)</i> <i>Khulna Unit</i></p>
<p>“I have been working at IFRC since the last six years, and I worked for GTZ and ActionAid before. I studied for a Masters in Environmental Science at Khulna University and since then worked in the field of natural resources and ecosystems management, which led me to work in the disaster management field.”</p> <p>“After Cyclone Sidr in 2007, we provided contractor-built housing, which provided us with lessons leading to the adoption of an owner-driven approach in this project after Cyclone Aila. We carried out extensive consultations with cyclone-affected</p>	<p>“I am from Khulna district and worked as a Youth Volunteer with BDRCS in this project. I was involved in all stages of the project.”</p> <p>“This area has a water problem due to salinity intrusion. That is why we prioritised improving the water supply by installing Pond Sand Filters and rainwater tanks.”</p> <p>“People were expecting us to build complete houses for them, but our budget didn’t allow that. If we did that, we could have supported less people.”</p> <p>“We selected the most vulnerable people as beneficiaries. There was some interference by local powerful people who wanted their</p>

<p>communities and understood that they would be able to build their own houses with our support.”</p> <p>“The project beneficiaries are happy, as on top of shelter, we provided many other forms of support to build their resilience.”</p> <p>- Interviewed on 22 August 2013</p>	<p>followers to get housing support, but we managed to overcome that tactfully. Because we provided so many forms of support other than housing, the whole community has benefited.”</p> <p>- Interviewed on 27 August 2013</p>
<p>(Photo)</p>	<p>(Photo)</p>

4. Reconstruction Process

As mentioned earlier when describing the project’s context, reconstruction of embankment was delayed by more than two years due to dyke failure in the cyclone and consequent inundation of vast areas, and the slow process of repairing the dykes. BDRCS provided relief and other support to the disaster-affected and displaced communities, and this period allowed project planning by reviewing the lessons from previous projects and identifying the neediest and most vulnerable households by using IFRC’s Vulnerability and Capacity Assessment (VCA) toolkit. A list of beneficiaries for housing and livelihood support was prepared in consultation with local government authorities. Additionally, extensive community consultations were carried out on reaching agreement on the owner-driven housing reconstruction approach and the types of community infrastructure that would be appropriate.

Because of the remoteness and rural nature of the area, building materials had to be procured from cities such as Khulna and Dhaka. Much of the transportation was done by boats. However, because of the owner-driven approach followed, local construction workers were employed by the beneficiary households, which helped support the disaster-affected local economy. BDRCS volunteers, beneficiaries and construction workers were provided training by BDRCS on ‘Participatory Approach for Safe Shelter Awareness’ (PASSA), based on the PASSA training manual developed by IFRC.

Beneficiary households were given a set of building components, a sanitary latrine and a rainwater tank, and a grant to purchase other building materials and employ construction workers. The building components were provided first and after a raised earthen plinth was built and the components installed with BDRCS’s technical support, the grant was released for completion of the house. Most beneficiaries contributed extra money and in some case salvaged materials from previous houses to build the house so that it met their needs and preferences.

5. Project Features

The project aimed to bring people displaced by the cyclone and subsequent prolonged inundation back to their villages after the damaged dykes were repaired and supported

them to recover from the impacts of the disaster. An integrated recovery and reconstruction process leading to long-term community development was followed. The main elements of the project included:

- **Housing:** Each beneficiary household was provided a set of building components including six reinforced concrete (RC) posts, eighteen pieces of corrugated iron (CI) sheets together with four ridge pieces, screws, washers, nails and wire for fixing them, and timber and bamboo for the roof frame. A sanitary latrine with walling materials for privacy (see Fig. C) and a 1000-litre capacity rainwater tank (see Fig. D)



(Fig. C: Sanitary latrine with walling materials for privacy was provided to each housing beneficiary household)

were also provided to each household. Each household was given BDT 10,000 (about US\$125) to buy additional materials, particularly walling materials, and pay construction workers. Household members assisted in the construction of houses and employed construction workers from the community.



(Fig. D: 1000-litre capacity rainwater tanks were provided to housing beneficiary households)

- **Water and Sanitation (WatSan):** Because of the salinity, particularly after the cyclone, groundwater was not suitable for drinking. Even in normal times, this coastal area faced problems of drinking water due to climate change induced sea

level rise and consequent salinity intrusion. Therefore alternative drinking water sources including rainwater were promoted in the project. Two Pond Sand Filters (PSF) to purify rainwater collected in a pond was repaired, which had been provided by the government before the cyclone, and six new PSF was built (see Fig. E). four community rainwater tank was also built (see Fig. F). These facilities catered to the whole community beyond the 155 households that had received housing support and individual rainwater tanks.



(Fig. E: New Pond Sand Filter built in the project)



(Fig. F: Community rainwater tank)

Similarly three community toilets and bathroom consisting of six chambers (three male and three female) were built to serve the whole community (see Fig. G). Each male and female section had a bathroom chamber, latrine chamber and a children's latrine chamber (with a smaller toilet pan).



(Fig. G: Community toilet/bathroom)

- **Livelihoods:** From the 155 beneficiary households that received housing support, 107 very needy households received BDT 10,000 (about US\$125) as livelihood assistance, combined with training from the local government sub-district headquarters on livelihood development in fisheries, poultry, livestock and agriculture. All the households in the community were given saplings of fruit trees to plant on their homesteads to generate income. Importantly, livelihood support was provided through a cash-for-work program for excavating earth and raising the playgrounds of two schools above flood level and four roads of a total length of more than 1200 metres.
- **Disaster risk reduction (DRR):** Trees were planted on the sides of the newly constructed risk roads to stabilise the slopes and prevent erosion. These roads also served as dykes (see Fig. H), so stabilising them protected them from collapsing as the dykes had done in the cyclone. A household level awareness campaign on understanding cyclone early warning and evacuation was conducted. The Cyclone Preparedness Program (CPP), a large volunteer network of BDRCS, was extended to the area by providing training and early warning dissemination equipment to community volunteers.



(Fig. H: Roads such as this were built through the cash-for-work program and also served as dykes)

- **Health services:** Support for community health was provided by a medical team through promoting health awareness and education. Existing government health service facilities were renovated and improved.

5. Success Factors

In this project, the success was linked largely to the integrated process within which factors relating to housing and community infrastructure played an important part, as discussed below:

- **Owner-driven approach:** Unlike the typical donor-driven contractor-built approach followed by most agencies in post-disaster housing reconstruction projects in Bangladesh, the owner-driven approach in this project was a strong factor contributing to its success. With the building components and grant money provided by BDRCS, together with the beneficiary households' own resources, they were able to build houses as they preferred (see Boxes A and B). They were also able to control the construction and monitor the quality of additional materials. BDRCS engineers and volunteers supervised the construction to ensure further quality. This led to beneficiary satisfaction and avoided attribution of blame to the implementing agency.

Box A

Yusuf Ali Sikdar worked as a sharecropper and lived with his wife and two sons in Joynogor village, Dacope. After receiving housing support from BDRCS, he built his house with mud walls, which was a local building tradition. He dug a fishpond on his homestead and used the earth to build the walls. He spent an extra BDT 10,000 (about US\$125) from his own savings to build the house. A significant part of this money was spent on labour for digging the pond and processing the earth.

Yusuf also spent money to buy two extra CI sheets of the same green colour as those given by BDRCS and built a larger house than what would have been possible with the BDRCS sheets. He also bought some cheaper CI sheet to build a front veranda. He used nylon rope to tie down the roof of his house. "I am scared of another storm, so I am trying to keep my new house safe," he said. Yusuf was happy for the support he received, as he expressed: "They [BDRCS] saved us; without Red Crescent we would not have survived. We never had a CI sheet house in this area and now I own one!"

- Interviewed on 26 August 2013

(Fig. 1: Photos of Yusuf, his house/ no floor plan)

- **Good quality building components:** BDRCS ensured that the building components provided were of a very high quality. The components made of reinforced concrete

(RC) including the posts and latrine slabs were produced in a local open area, but the materials – cement, sand, rods and aggregate – were all procured by BDRCS in cities, Dhaka or Khulna, where generally the best materials could be found; only materials of very good quality were chosen.

Each household was given six RC posts, instead of four as originally planned, so that the house could be sturdy. Each post had the dimensions 100mm x 100mm x 3800mm so that they were strong and had steel reinforcement rods extended at one end for attaching the wall plate and rafters. The post design included a 380mm long T-footing, so that it could be anchored securely in the ground. Four reinforcement rods and twenty two closely spaced stirrups inside the posts made them strong.

The CI roofing sheets provided were also of high quality, among the best available in the country. Their thickness, 0.42mm, provided better resistance against wind; generally rural houses did not use CI sheet thicker than 0.30mm, and often much less, making them prone to easy lift-off in storms. The sheets were galvanised with a green pigment to prevent rusting and to reduce daytime heat gain. All the houses were built with a hipped roof (*chouchala*) for better wind-resistance than gable roofs.

- **Comprehensive community infrastructure:** Infrastructural support was provided at two levels: (a) Individual beneficiary household level combined with the housing support, including a rainwater tank and latrine and (b) Whole community level, including PSFs, rainwater tank, communal toilet/bathroom and cash for work for communal infrastructure development. This allowed targeting the neediest and most vulnerable households with intensive inputs and at the same time catering to the wider needs of the community. Some of the community facilities were also used by housing beneficiaries, especially the bathroom, as most houses did not have bathing provision (see Box B). Attention to details contributed to the project's success, such as solar-powered lighting in the community toilet provided safety for women at night; small toilet pans in the children's chamber of the community toilet made it user-friendly. Good quality of construction and materials was ensured for all the infrastructural components through supervised procurement and construction.

Improvement of existing practices was undertaken instead of introducing alien concepts. People drank surface water from ponds because of salinity of groundwater, and the PSFs built in the project helped purify the water. Again, people generally collected rainwater to avoid drinking groundwater, but did so in randomly placed small containers leading to loss of extra water. A large rainwater 1,000-litre tank to collect water flowing down from roofs allowed avoiding such loss and storing the water for dry periods.

Box B

Moyna Begum lived in Joynogor village in Dacope with her husband and two small children. Her husband was a fisherman, and he was injured in Cyclone Alia and became disabled. Moyna's previous house, made of palm leaves (*golpata*) was washed away in the cyclone and her homestead was flooded for nearly three years by water from the storm surge that came with

the cyclone. During that time she and her family lived in a plastic tent on a nearby dyke. “It was a time of great difficulty”, narrated Moyna. They had to bathe in the salty water, which was everywhere, and there were no toilets or other services. They could not earn much income in that situation and depended on relief from BDRCS and other organisations.

Moyna’s household received housing support from BDRCS, but no livelihood support as they were able to earn some money from fishing. Together with the building components and the BDT 10,000 (about US\$125) from BDRCS, she added another BDT 6,000 (about US\$75) to build this house. She bought extra CI sheet, though not as good as that given by BDRCS, to make a front veranda. She paid a carpenter (*mistri*), and she and other household members and neighbours helped him build the house. “It took us five days to build the house as some of the parts were ready-made [CI sheet, RC posts, framing, etc]”, she reported. She also bought a solar panel for electricity as there was no national electric supply in this remote area.

The household was given a sanitary latrine and rainwater tank, but as there was no bathroom or water supply, she and her family went to the nearby communal toilet/bathroom for bathing, which Moyna did not mind. “We are happy with the house and the quality of the CI sheet and RC posts given by Red Crescent [BDRCS] and all their support,” expressed Moyna.

- Interviewed on 26 August 2013

(Fig. J: Photos of Moyna, her house/ no floor plan)

- **Integrated approach:** Integration of housing with a range of community infrastructure and welfare components was important. Again, in this remote area, people had negligible access to medical facilities; therefore support for improvement of health services was crucial.
- **Benefits of DRR elements:** Because this was a remote area, communities there in the past did not benefit from a localised early warning system, although BDRCS’s Cyclone Preparedness Program (CPP) had an extensive network in coastal areas. Extending this network to the area, together with training of local volunteers and community awareness-raising ensured that the community would be safer and better prepared in future disasters. Structural elements also contributed to DRR: building roads that provided income to the community also doubled as dykes to mitigate flooding. Where housing support was provided, it was ensured that plinths were raised by



(Fig. K: Raised house plinths were built to protect from flooding)

a metre or so above the ground level to protect the houses from flooding (see Fig. K).

- **Livelihood support:** In this impoverished and remote area affected by a prolonged disaster, it was essential to revive livelihoods for the success of the project. This was addressed at two levels: Firstly by providing support to the most needy and vulnerable households, and secondly, providing support in the form of a cash-for-work program that benefited the wider community. The outputs of the cash for work program – playgrounds and roads raised above flood level – benefited the entire community.
- **Extensive experience:** The Red Cross movement was a longstanding body in the humanitarian field with extensive experience in post-disaster housing. Its large global network and access to human and material resources allowed implementing this project in a professional and sensitive way. BDRCS was well-known and respected in the project area, and hence communities and local authorities there welcomed its support and extended full cooperation.

6. Project Challenges

Such a remote location obviously presents challenges, especially after a disaster such as this with a prolonged impact. Beyond that, the context itself had its own constraints, some of which included:

- The coastal areas of Bangladesh such as this one were exposed to climate change impacts. The flat low-lying terrain made it particularly vulnerable to sea level rise. In such a situation the sustainability of projects like that of BDRCS was severely threatened.
- Bangladesh had an overall poor level of infrastructure and transportation, isolating areas such as this which were at a distance from the main cities. There was thus a tendency for people to migrate, which again had implications for the sustainability of the project.
- In a context of widespread impoverishment, security was a key challenge. For example, beneficiaries feared theft of their rainwater tanks installed outside their houses. Some of them had already lifted the tanks onto the veranda (see Fig. L) closer to the house to keep them safe. Thus there was a need for rigorous surveillance of the community infrastructure provided in the project, adding to the community's workload.

(Fig. L: This rainwater tank was brought onto the veranda to keep it safe from theft)



7. Key Lessons Learnt

This project clearly demonstrates that even in very difficult circumstances, success can be achieved in post-disaster reconstruction projects. Some of the key lessons from the project include:

- The owner-driven approach offers distinct advantages over donor-driven housing projects. The approach is more effective if it is backed by strong quality assurance and supervision by the implementing agency.
- The importance of integration of housing with community infrastructure, instead of only building houses, was underscored in this project.
- The project offers a lesson on how a two-pronged approach can utilise a limited budget to address the needs of the neediest people as well as the wider community.
- Reconstruction as a way of addressing entrenched vulnerability was demonstrated in this project. The houses built in the project, and the community-wide initiatives, made the beneficiaries and their community more resilient to future disasters.
- The strategy of procuring materials from reliable sources and transporting them to the project area where such materials were not available, backed by supervision and quality control during construction, offers a lesson on working in remote isolated locations.

8. Conclusion

This project was notable for its owner-driven housing, rare in the post-disaster housing reconstruction field, thus offering the possibility of understanding the value and effectiveness of the approach. The integration of housing with community infrastructure was its other strong point. The ability to achieve success even where the odds are overwhelming was clearly demonstrated by this project.