

Flood-Resistant Shelter Pilot Project in India

New Shelters Offer Buffer Against India's Floodwaters

Flooding is a way of life in much of rural India, where annual monsoon rains swell the river systems that crisscross large areas of the nation's vast landscape. Years of deforestation, coupled with poor land planning and overcrowding, have left millions of India's rural poor facing recurrent disaster, as flood waters wash away their livelihoods, their material possessions and their homes, most of which are built of a simple mud construction that is highly vulnerable to flooding.

"... when they saw the materials and the quality of the construction they were really happy about it and they really appreciated it..."

Kirtimayi Mishra, female
CRS Project Manager for Disaster
Risk Reduction Innovations Fund

Fighting Back

But many residents in eastern India are fighting back thanks to a disaster risk reduction project launched by Catholic Relief Services in the disaster-prone states of West Bengal and Orissa. CRS' emergency shelter expert worked with communities to identify their vulnerabilities to disasters and to determine priority actions to increase their resilience and protect lives and livelihoods from future catastrophes. The result is an innovative design to make houses more resistant to floodwaters. The design uses affordable, locally available materials like concrete mix and chicken wire for an improved foundation and wall construction and a wind-resistant roof design. CRS has helped villagers build 157 flood resistant shelters in four communities in Orissa and West Bengal using this innovative design.



CRS project participant Sukanti Dalai uses an improved mixture of mud and straw to complete the walls of her home using techniques to make it more flood resistant in the village of Raipur in Orissa state. Dalai and her husband have lost their home to flooding more than a dozen times in their lifetime. • Photo by David Snyder for CRS

The CRS shelter expert, working through local partner agencies, has also trained local artisans how to raise their houses on concrete-coated earth mounds known as raised plinths, making them far more resistant to the long-term water immersion that accompanies extensive flooding. It is hoped that this model will inspire others to replicate the design, including the government, as the need for flood resistant housing is so great in India.

“... This project has been an eye opener for me because I never knew that by using local resources we could build disaster resistant shelters....”

Naresh Kumar Panda, male
Secretary for CRS partner agency
WIHRET (Women's Initiative for
Human Resource Education
and Training)

“Surely it [the flood resistant house] will withstand floods, because from the normal flooding level the house has been raised two feet, so it will not allow the entry of water,” said Dukhiram Dalai, project participant in the village of Raipur in the state of Orissa. “And then the mud has been plastered with chicken wire and given a concrete layer so it will not wash away.”

Saving More Than Homes

This pilot project, launched in 2008, is part of a wider CRS disaster risk reduction effort aimed at breaking the cycle of emergencies and response that has marked recent years in India's most flood-affected areas. Communities are increasing their resilience to disasters through measures that they have identified as most important to protect lives and livelihoods. The flood resistant shelter project is one of three components of a comprehensive disaster risk reduction program in these villages. Villagers are also engaged in community based disaster preparedness to build capacities to mitigate and respond to disasters and to strengthen and diversify livelihood activities, all designed to increase their resilience to the natural disasters they face.

For many villagers like Dukhiram Dalai losing their homes several times in recent years, the flooding creates a cycle of poverty that becomes inescapable, as flood victims seek local money lenders for loans to rebuild, and spend a year or more paying that money back, often simply to lose their homes in the next flood because they can afford only inferior building materials. At age 52, Dalai says he has lost his home 10 – 15 times in his life, and spends an average of 3,000 – 5,000 rupees (\$66 - \$111) each year – more than 90% of his usual annual income as a laborer - simply to rebuild. These costs, in addition to the time required which takes them away from earning their livelihoods, push

people into increasingly lower levels of poverty which results in major setbacks in development gains.

“I thought if I could use concrete pillars the house would be stronger,” Dalai said. “I had the idea, but I did not have the resources.”



A local woman makes a brick of densely packed earth at a small outdoor facility in the village of Langleswar, in the state of Orissa, India. These building bricks are environmentally friendly and are being used on homes built by CRS to be flood resistant.

• Photo by David Snyder for CRS

With the money he expects to save in repairs, Dalai says he hopes to invest in a small business selling fish, earning extra income for his household and perhaps saving money for the first time in his life.

“Now we are sure we will have a proper house, and we will continue to live in this house. The issue of flood resistant housing has been addressed, which is a big problem in this area.”

“I think this is a great project. It has a number of innovative features to make houses more resilient to flood damage for the flood areas....”

Kirtimayi Mishra, female
CRS Project Manager for the Flood Resistant Shelter project



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