

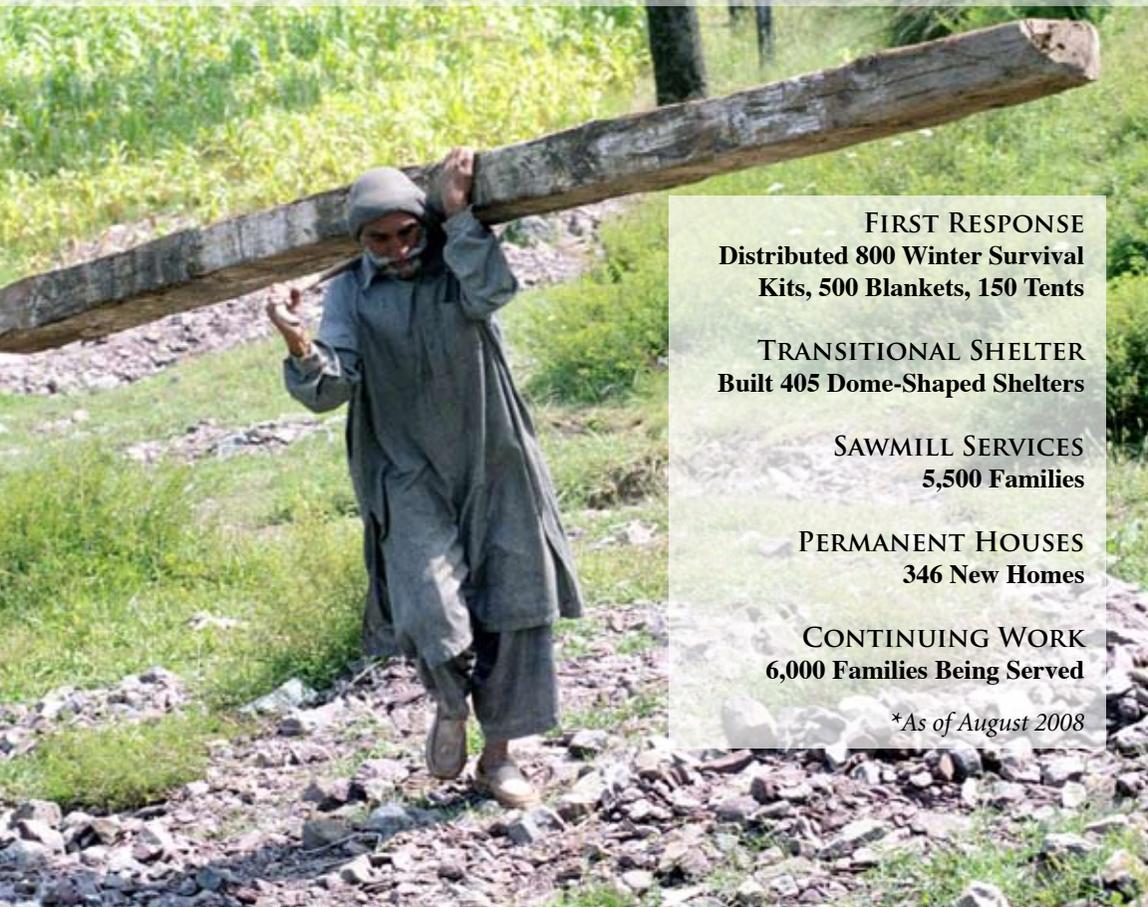
# Pakistan Earthquake

CHALLENGES & INNOVATIONS  
AFTER THE 2005 EARTHQUAKE





# Habitat for Humanity: The Work\*



**FIRST RESPONSE**  
Distributed 800 Winter Survival  
Kits, 500 Blankets, 150 Tents

**TRANSITIONAL SHELTER**  
Built 405 Dome-Shaped Shelters

**SAWMILL SERVICES**  
5,500 Families

**PERMANENT HOUSES**  
346 New Homes

**CONTINUING WORK**  
6,000 Families Being Served

*\*As of August 2008*

# 8:50 am 8th October

On 8th October 2005, at 8:50 in the morning, a magnitude 7.6 earthquake struck Pakistan, India and Afghanistan. The epicenter of the earthquake was located near Muzaffarabad, the capital of Pakistani-administered Kashmir, and approximately 100 km. (60 miles) north-northeast of Islamabad, the national capital. A series of aftershocks followed. The earthquake devastated towns and villages in the harsh mountainous terrain of North West Frontier Province, Northern Punjab and Pakistani-administered Kashmir. Poor communities in remote areas bore much of the brunt of the earthquake. Even before the tragedy, people in six of the nine most-affected districts scraped a living from their small landholdings. Food shortages were common. Literacy levels were very low. Government services had difficulty reaching these remote valleys and mountains at the best of times; a normal winter would leave many communities cut off and isolated for weeks at a time. After 8th October, life became even more harsh.

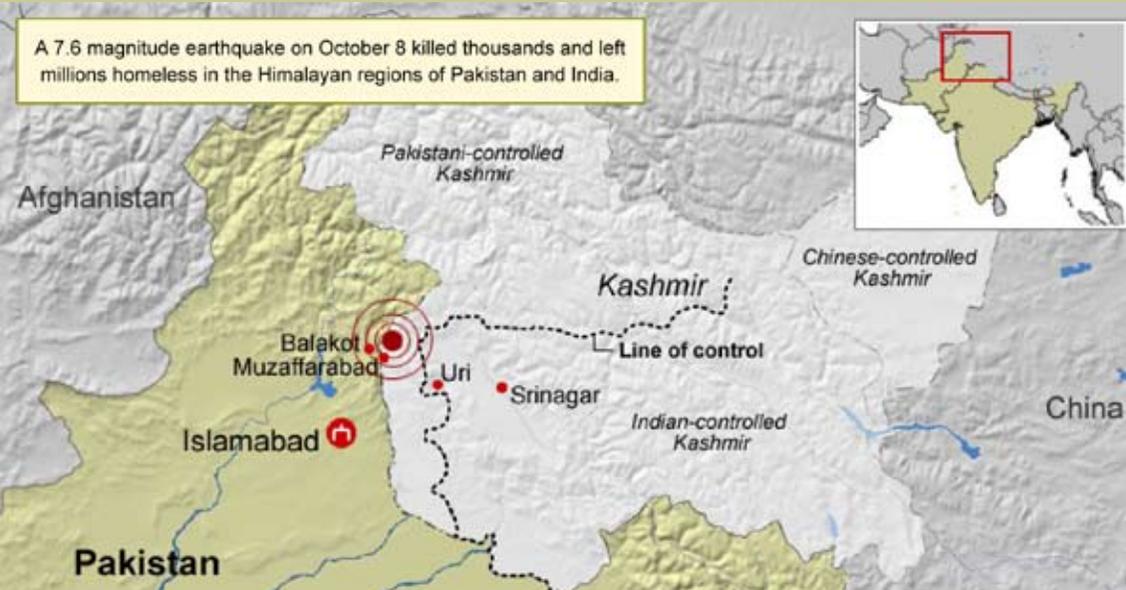


شاه



# The Epicenter of the Calamity

A 7.6 magnitude earthquake on October 8 killed thousands and left millions homeless in the Himalayan regions of Pakistan and India.



Aftershocks and landslides severed roads hampering relief efforts. Some 250,000 people were forced into tented camps. Almost three-quarters of a million people were stranded in the mountains relying on airlifts for food, shelter and medicines. Overall, the Pakistani government estimated that the earthquake had affected 3.5 million people: killing 73,276 people, injuring another 70,000, and rendering 2.8 million homeless.

The earthquake had a devastating impact on housing. Pakistani census data had 788,000 homes registered in the area. The earthquake destroyed at least 400,000 homes, more than half of the total, and left many thousands more uninhabitable.

As relief made way for reconstruction, the challenges of coping with the scale of the devastation and the remoteness of many communities were compounded by more landslides and the approaching winter.







# First Response

Habitat for Humanity International responded to the earthquake with an initial commitment of US\$250,000 to provide technical assistance and support to HFH Pakistan and partner organizations. The Swiss-based International Organization for Migration mobilized HFH Pakistan to distribute US\$100,000 worth of supplies in the immediate aftermath, including 800 winter survival kits, 500 blankets, 150 waterproof tents, as well as ropes, buckets, nails, and tarpaulins to cover leaking roofs.

Habitat for Humanity's target was to build earthquake-resilient permanent homes. But in the meantime, transitional housing was needed for two types of families; those who chose to stay on their land rather than be relocated to tent camps and those families who had been in tent camps but who wanted to return to their villages as winter approached.

At the time of the earthquake, HFH Pakistan had an office in the southern port city of Karachi and was working in Sindh province. Within days, Habitat representatives were in the disaster area. For one month, Habitat worked out of Balakot, a town near the epicenter of the earthquake. Working with representatives of TEAM (The Evangelical Alliance Mission), Habitat staff visited villages and communities around Balakot to understand their needs. One decision was quickly made: HFH Pakistan would move its offices to the country's capital, Islamabad, to enhance its response and to be able to work more closely with the government authorities co-ordinating the rebuilding efforts.



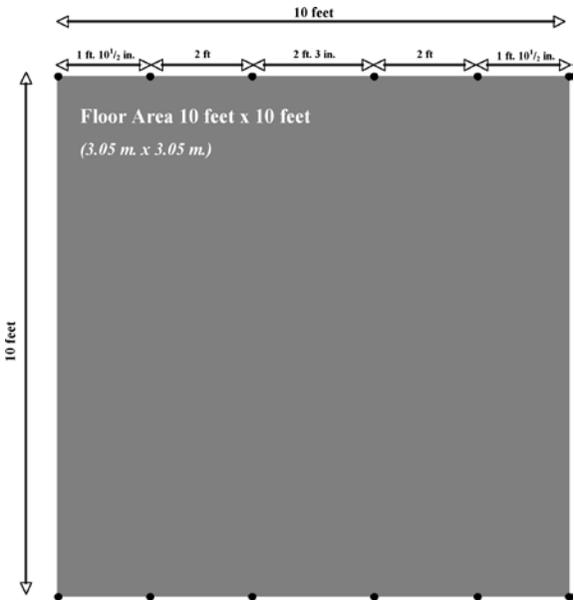


HFH Pakistan looked at the available shelter solutions. Partner Aid International, a Swiss-based development and relief agency, offered a dome-shaped shelter design. The design was adapted to create transitional homes: shelters that could be quickly assembled and which featured materials that could be reused later in permanent houses. The first transitional house was assembled in the village of Thanda Katha on 20th February 2006. The modular shelters were made of metal sheeting paid for by Habitat donors and flown to remote areas by the Pakistani military. Each house provided insulation and protection against cold and wind.

# Transitional Shelter



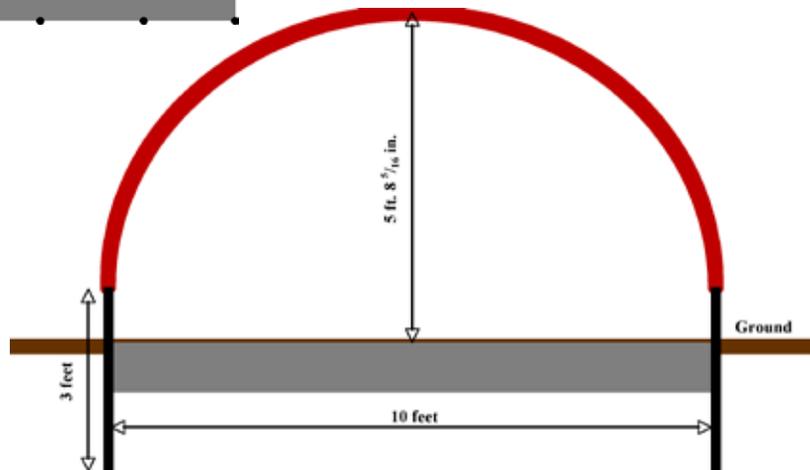




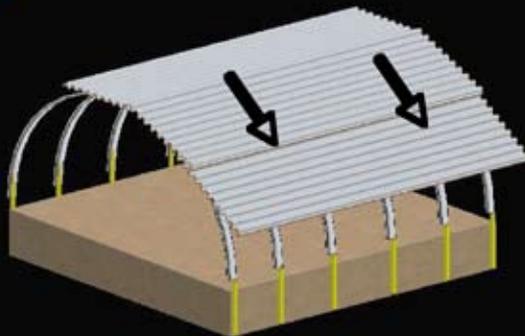
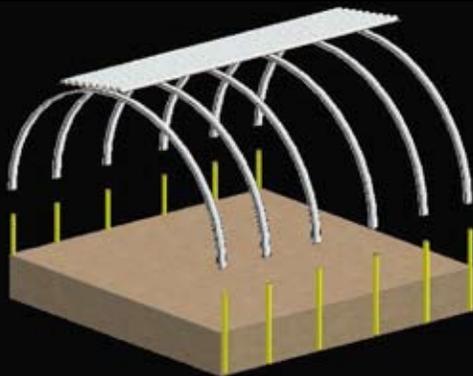
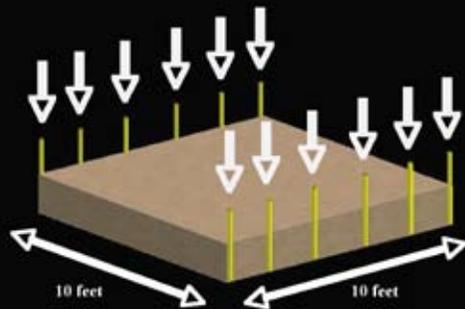
# Construction of

## KEY MATERIALS

- **Steel rebar:** 12 pieces, each 3 feet x 1.2 inches
- **Tubular pipes:** 6 semicircular pieces, each 15 feet 8.5 inches x 1 inch
- **Galvanized corrugated iron sheets:** 8, each 11 feet x 3 feet, preferably 26 gauge
- **Insulation material:** unblown foam is ideal
- **Metal ties:** similar to materials used for tying bales of cotton.



# Transitional Shelter



# Advantages of Transitional Shelters

- **A speedy solution:** a trained team can assemble a shelter in 30 minutes.
- **Cost effective:** a transitional shelter costs US\$200-250, or roughly the same as a tent. But it lasts longer, is more secure and provides better protection in harsh weather conditions.
- **Reusable:** all the materials used to construct a transitional shelter can be reused when a permanent replacement structure is built.
- **Flexible:** if building a permanent home takes longer than expected, family members and their possessions can remain secure in the transitional shelter.
- **Expandable:** if the shelter needs to be used for longer periods, doors and windows can be added.
- **Safe:** the shelter is safer than a tent in case of fire.
- **Earthquake-resilient:** the design is strong and less likely to collapse during the months of aftershocks that follow a major earthquake.







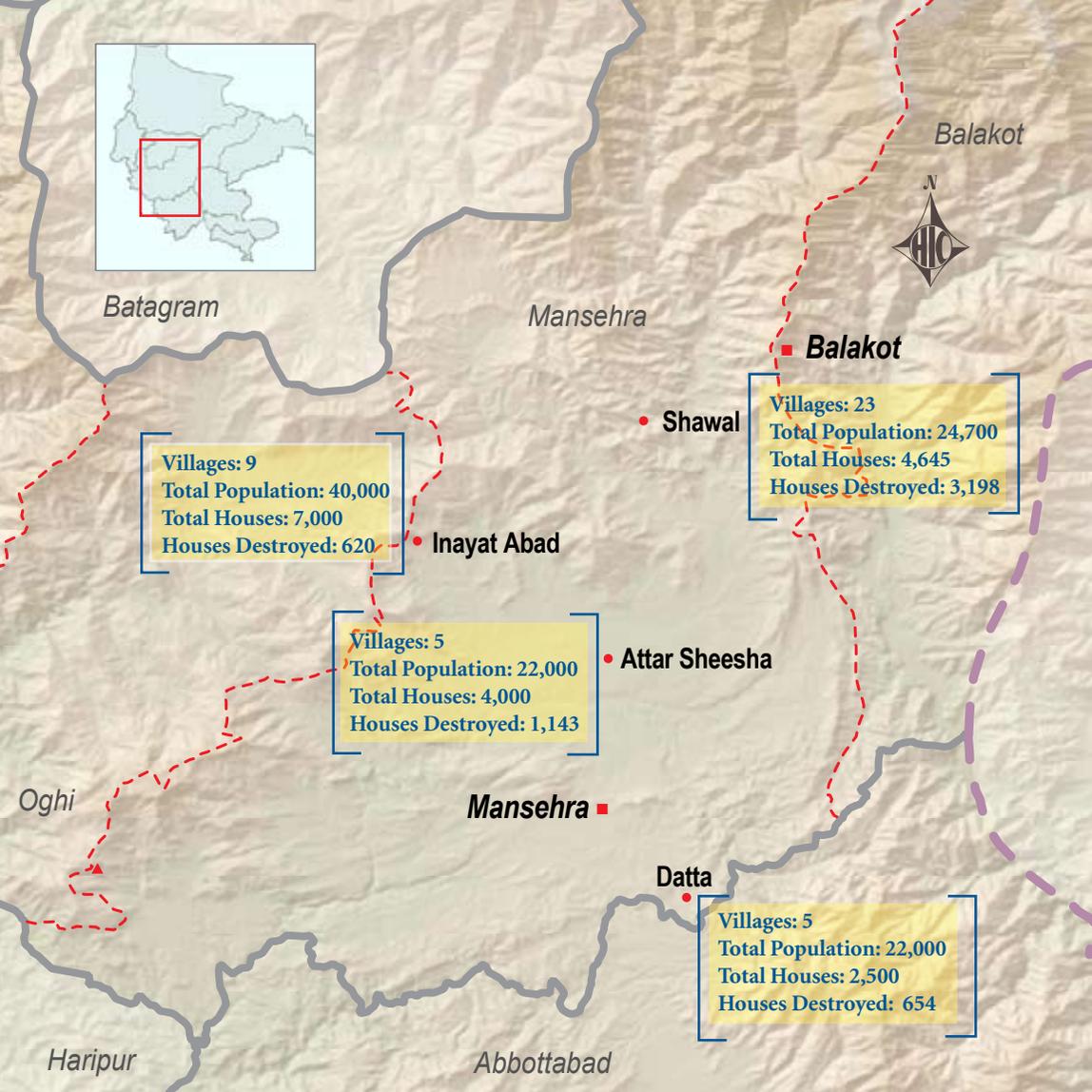


# Training & Reconstruction

In the first phase of its response, Habitat for Humanity provided funding and construction and project management expertise to partners. Within a year, Habitat had moved forward with establishing a long-term program. In this second phase, HFH Pakistan wanted to create more permanent housing solutions in areas further away from Balakot. Habitat for Humanity staff created an onsite technical team to begin training crews to build homes in accordance with new government building codes. Habitat for Humanity staff trained local trainers, certified house designs, and provided training on the proper use of lighter-weight materials, proper linking of superstructures and foundations and other government-mandated standards.







Balakot

Batagram

Mansehra

**Balakot**

• Shawal

Villages: 9  
Total Population: 40,000  
Total Houses: 7,000  
Houses Destroyed: 620

• Inayat Abad

Villages: 23  
Total Population: 24,700  
Total Houses: 4,645  
Houses Destroyed: 3,198

• Attar Sheesha

Villages: 5  
Total Population: 22,000  
Total Houses: 4,000  
Houses Destroyed: 1,143

**Mansehra**

Oghi

• Datta

Villages: 5  
Total Population: 22,000  
Total Houses: 2,500  
Houses Destroyed: 654

Haripur

Abbottabad

Pakistan's Earthquake Reconstruction and Rehabilitation Authority (ERRA) announced a US\$3.5 billion, three-year recovery plan for earthquake-affected areas. Families building their homes to new earthquake-resilient designs were eligible for government grants. In August 2006, the authorities assigned HFH Pakistan to rebuild in four Union Council areas. About 30 percent of the more than 18,000 homes in the areas had been destroyed or badly damaged.

Several factors hampered local people from building their homes to the new government standards. There was a lack of skilled labor. There were shortages of roofing sheets and materials for the upper portions of walls. There was no equipment for cutting the significant amounts of wood and timber that had been salvaged from existing houses.

It was clear that in order to prevent death and injury from another earthquake, a different house would be needed. The design would have to be acceptable to the traditions of local families and would have to meet the new government building standards.

Normally, beneficiaries of Habitat for Humanity programs have to contribute "sweat equity", work on their new home and those of their neighbors. They also have to repay an affordable, no-profit mortgage. Having lost their homes, the victims of the earthquake did not fit the typical Habitat profile. However, many families had started rebuilding their homes, often by hand. The challenge for HFH Pakistan was to organize these efforts into something more effective.

# Habitat Resource Center

To ensure houses would be rebuilt successfully, HFH Pakistan established community-based resource centers in Mansehra and Balakot. The centers served and continue to serve three important functions: they are bases for local Habitat teams to store construction materials; places for members of the communities to come together and decide about their rebuilding programs; and places for people to receive training and advice.

The centers were also distribution points for materials. Designs were tried and tested to ensure they worked and were earthquake-resilient. Villagers would consult about needs and preferences. Families brought along pieces of salvaged timber for cutting and processing. In Pakistan, as in many parts of the world, Habitat Resource Centers become an important focus for creating all kinds of housing solutions.





Habitat  
for Humanity

Centre  
nse



In any earthquake, many deaths and injuries are caused by heavy ceilings falling in. The same was true in Pakistan where many roofs made of heavy timber beams collapsed.

HFH Pakistan adopted the idea of reworking many of the heavy, but salvaged timbers. The wood would be sawed and processed into lighter pieces for the new earthquake-resilient house design.

As many communities were very remote, it was easier to take the equipment to the villages, rather than bring the timbers to the resource centers. HFH Pakistan used mobile sawmills that moved from place to place. At each stop, villagers brought their salvaged timber for cutting into boards and trusses for lighter roofs. Families needed less wood to make stronger homes. And reusing existing materials had another environmental benefit: fewer trees had to be cut down for construction.

Three mobile sawmills, paid for by a Japanese government grant funded through HFH Japan, were in constant use. The mills were taken, often almost dragged, to serve remote villages at high altitudes. Roads were in a poor state or non-existent. Materials had to be taken by four-wheel drive vehicles, tractors, pack animals or human backs.

Whether building a Habitat home or their own home, villagers were welcome to bring their timber for cutting.





# Into Permanent Homes

One of the goals of HFH Pakistan was to turn the dome-shaped transitional shelters, into something larger and more permanent that could be built from existing materials.





# Housing Design

Habitat for Humanity produced a design that focused on the upper portion of the walls and ceilings. The idea was to lighten the structure and reduce risk. Traditional designs built high walls with mud, stones and timbers. The new design involved a three-foot high rock and wood wall, with an upper section of lighter corrugated iron roof sheets, metal side sheeting, and insulation. The design conformed to new government standards.

Habitat provided the roofing and side sheets, technical assistance, and sawmill services. The rest: wood, stones and mud, plus unskilled labor, came from the families.

The estimated cost of a new home, if materials had to be bought commercially, was US\$2,500. By dismantling and reusing materials from the transitional shelters and reusing salvaged timber and wood, the cost was just US\$500.





# The Korean Volunteers

In late January 2007, a 16-strong team of student volunteers organized by HFH Korea spent a week building in the area around Balakot. The students, from Seoul's Myungji University worked on erecting 25 transitional shelters and 15 permanent homes in Batsanger, Ghanoon and Kanshian. They helped lay foundations, and erect wall siding and roofs. They also used the sawmill facilities at the Habitat Resource Center at Balakot to cut wood and timber for 56 families to use in their new homes. HFH Korea raised US\$35,000 from KOICA (Korea International Cooperation Agency) for rebuilding homes for earthquake survivors.







# Reconstruction Continues

HFH Pakistan now works in partnership with villagers, volunteers, local authorities and engineers to create new ways to strengthen traditional construction and promote earthquake-resilient construction. Through the Habitat Resource Centers, Habitat continues to construct and test new house designs in consultation with vulnerable families, partners and governments.

In late 2007, a new phase in HFH Pakistan's work got under way. The Canadian International Development Agency began funding, via HFH Canada, a continuation of HFH Pakistan's work in the Union Council areas. The two-year, US\$900,000 project will see an extension of the mobile sawmill services as well as training out of the Habitat Resource Centers at Balakot and Mansehra. The training includes full-day sessions on introducing to earthquake-resilient home designs and construction techniques for building safely. An estimated 6,000 families are expected to benefit.

# Habitat for Humanity Commitment

Habitat for Humanity Pakistan continues meeting the housing needs of those who lost homes in the devastating earthquake of October 2005. HFH Pakistan continues to serve those in need, especially in rural areas, through a combination of house reconstruction, training and work opportunities. Habitat Resource Centers provide training and sawmill services for free. As families continue rebuild their communities, Habitat for Humanity, its partners and supporters continue to help.

## **The results to date**

- Thousands of families – tens of thousands of individuals—now live in secure and decent shelter in four Union Council areas.
- Families have improved physical security, health and well-being.
- Families are able to focus on agriculture and earning a living rather than housing issues.
- Families have materials from shelters for building or extending permanent homes.



# Acknowledgements

## Principal Donors

With thanks to the principal donors who have supported the rebuilding program in Pakistan.

- American International School, Budapest, Hungary
- Canadian International Development Agency
- HFH Australia
- HFH Canada
- HFH Hong Kong
- HFH Japan
- HFH Netherlands
- Japan Platform
- Kanda University of International Studies Habitat campus chapter, Japan
- Korea International Co-operation Agency
- Kyoto Gaidai Habitat campus chapter, Japan
- SAP Germany



# Habitat for Humanity's Disaster Response Program

The mission of Habitat for Humanity International's disaster response program is to develop innovative housing and shelter assistance models that generate sustainable interventions for people vulnerable to or affected by natural disasters, conflicts and other calamities.

## **Contributors to *Pakistan Earthquake: Challenges & Innovations* *After the 2005 Earthquake***

**Athima Bhukdeewuth**, Graphic Designer,

Habitat for Humanity International, Asia-Pacific office

**Mikel Flamm**, Photojournalist

**Mario Flores**, Director, Disaster Response Field Operations,

Habitat for Humanity International

**Farhan Mall**, Country Representative,

Habitat for Humanity Pakistan

**Peter Witton**, Director, Communications,

Habitat for Humanity International, Asia-Pacific office

***For additional information please contact:***

**Habitat for Humanity International Disaster Response Program**

270 Peachtree Street NW, Suite 1300 Atlanta, Georgia 30303, U.S.A.

[www.habitat.org/disaster](http://www.habitat.org/disaster)

*Published by*



Asia-Pacific office

Q House, 8th Floor 38 Convent Road, Silom Bangkok 10500, Thailand

[www.habitat.org/ap](http://www.habitat.org/ap)