



Design of seismic retrofitted Govt. Primary School, Aminabad, Chatorkhand, Ghizar, Northern Areas, Pakistan, 2008

## Vision of AKPBS,P

‘Peaceful and productive communities with secure, healthy, pleasant and comfortable living environment.’

## Programme Overview

Pakistan, with its diverse collection of geographical landscapes, is fairly exposed to natural hazards. The country, especially its northern highlands, falls in a seismically active zone with majority of the population living in high seismic activity area.

The Northern Areas of Pakistan are particularly prone to multiple natural hazard risks such as earthquakes, glacial movements, floods, snow and ice avalanches, rock falls, landslides, glacial lake outbursts and river erosions. These hazards make the lives of local communities insecure and threaten livelihoods by destroying agricultural lands, livestock and habitations.

- The Kashmir earthquake, the most devastating event recorded in the recent history of Pakistan, killed around 87,350 people, injured approximately 70,000 and rendered over 3.5 million homeless.
- 5 Glacial Lake Outburst Floods (GLOF) occurred during the first six months of 2008 in the Gojal, Hunza. These have seriously affected the lives of local communities by damaging roads, bridges, houses and cultivable land. The frequency of GLOF events is likely to increase with increasing climatic changes.

Local experiences suggest that in the Northern Areas people’s lives and health are extremely vulnerable to natural hazards because several lines of evidence show that one or more great earthquakes may be overdue in a large fraction of the region, threatening millions of people.

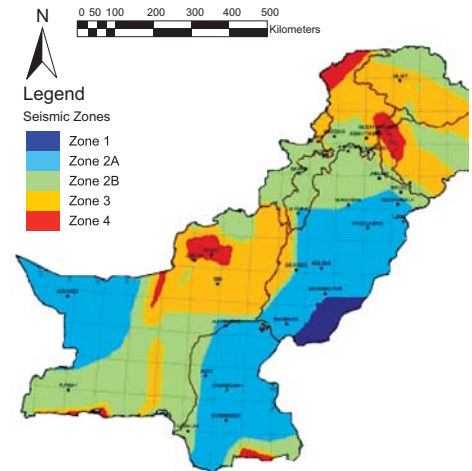
The region consists of more than 150,000 traditional houses of rubble stone masonry or earthen construction. This offers ample evidence of the weakness and high vulnerability of the local people towards natural hazards.

The poor are particularly vulnerable to environmental degradation because of its impacts on their livelihoods and health, and because of their increased exposure to natural hazards.

The increasing number and impact of disasters, the loss of life and property and the challenges that are faced in the aftermath of natural hazards exhibited the need for establishing appropriate policy and institutional arrangements to reduce losses from disasters in future.

The Habitat Risk Management Programme (HRMP) was initiated by the Aga Khan Planning and Building Service, Pakistan in 2007 to serve as a catalyst for Disaster Risk Reduction (DRR).

The Programme was the direct outcome of an endowment fund, titled ‘Fund for Sustainable Built Environment’, which was founded on AKPBS,P’s Alcan Award for Sustainability in 2005, a donation from His Highness the Aga Khan, 49th Hereditary Imam (spiritual leader) of the Ismaili Muslims and Aga Khan Foundation Canada.



Seismic Zoning Map of Pakistan indicates earthquake prone areas. Source: Prof. Sarosh Lodi, Chairman, Dept of Civil Engineering, NED University, Karachi. Building Codes Seminar Presentation, Gilgit, Nov.07

## HRMP Goal

‘Promote safer communities and advancement of sustainable development through reducing hazard risks and vulnerabilities.’





Children at Govt. Primary School Gulmuti, District Ghizar, Northern Areas, Pakistan participating in an earthquake evacuation training.

Schools can play a key role as the nucleus through with risk reduction knowledge and awareness can reach out to other members of the community. This can be done by children reaching out to parents, teachers reaching out to community elders, school management reaching out to disaster management experts and so on.

HRMP aims to build the resilience of communities to hazard risks (both natural and human induced); and to mainstream disaster reduction into development (social, economic, physical and ecological). The Programme emphasizes the integration of risk reduction into development through implementing structural and non-structural risk mitigations.

HRMP has been formulated through consultation with stakeholders at all levels, particularly communities at risk. Stories of affected communities, voices from the fields, indigenous knowledge to adjust and cope with the calamities have shaped the strategies and approaches of the Programme:

- To promote ‘Safe Haven Shelter’ concepts within hazard prone, mountain villages of Northern Pakistan
- To encourage adoption of seismic resistant building practices
- To strengthen lifeline systems through strategic and sustainable land use planning
- To promote cost effective, culturally sensitive and replicable retrofitting techniques for strengthening of existing infrastructure and develop seismic resistant technologies for new constructions
- To raise awareness and enhance disaster risk management knowledge and skills through capacity building programs
- To build the resilience of communities to disasters by training artisans in safe construction, communities in disaster risk management and youngsters in village mapping and documentation works

- To promote gender equity by involving women as decision makers in the planning and implementation of the program activities;
- To disseminate knowledge and information on DRR to other areas in Pakistan and to reflect the best practices to other compatible geo-physical, and socio-economic contexts within the region.

### HRMP Interventions

- Non-Structural Risk Mitigations
  - a. Awareness-raising on Disaster Risk Reduction
  - b. Trainings (female youth in village mapping, and artisans in safe construction/seismic retrofitting)
  - c. Technical advice (retrofitting new constructions and land-use planning)
- Structural Risk Mitigations
  - a. Retrofitting of existing structures (houses and community/public buildings)
  - b. Incremental support for the new construction/reconstruction of disaster resistant houses

### HRMP Activities

In order to materialize its goals and objectives the HRMP facilitates disaster preparedness by following a three-fold methodology:

- i) mapping and analysis,
- ii) development of specific solutions, and
- iii) physical implementation works.

This methodology contains a comprehensive set of activities that constitute HRMP’s implementation strategy.

### Establishment of Village Planning and Development Organizations (VPDOs)

In order to involve the communities in reducing disaster risks, HRMP initiates its projects with the formation of a village based planning and development committee of which 50% women participation is mandatory.

VPDOs play a crucial role in land use and strategic planning of villages, identification and selection of artisans and youth for trainings, participation in design and implementation of risk reduction measures and execution of seismically safe retrofitting and construction works.

The establishment of VPDO’s allows opportunities of active participation and capacity building to each community member, particularly of women. It also sets the foundation for participatory disaster preparedness and response.



HRMP trains local community members, especially women, on hazard mapping and safe construction techniques.

HRMP's fundamental policy is that there is a lot that can be done to prevent a natural hazard from becoming a natural 'disaster'. In 2003 an earthquake struck Iran which destroyed close to 90% of Bam's buildings and killed 26,000 people. Just four days earlier an earthquake of equal intensity had struck California and damaged 40 buildings and killed 2 people.

The structural weakness of masonry buildings is evident: A collapsed building after the Kashmir Earthquake, 2005. Picture courtesy of AKDN's Multi-Input Earthquake Reconstruction Programme (2009)



## Awareness - Raising

Hazard risks are fundamentally local in terms of their impact, as well as their response. Local communities, local infrastructure and local economies are directly affected by disasters. Vice versa, the local communities and authorities are usually the first to respond to any disaster situation. Therefore, it is crucial to enhance the knowledge of local people to reduce vulnerability and adequately respond to natural disasters.

In order to raise awareness amongst communities HRMP focuses on risks and vulnerabilities at the village level. The Programme's awareness-raising activities focus on multiple segments of society, such as community-based organizations, leaders and elders of the community, teams of volunteers, members of union councils, local politicians, school children, and local women to collectively and individually deal with disaster risk reduction and preparedness issues.



HRMP Reconstruction Project:  
Reconstructed house of Mr. Hazarat Shah,  
Gich, Ghizar, Northern Areas, Pakistan, 2008

## Skill Enhancement

More than 80% of the houses in the Northern Areas are of poor structural quality and can be regarded as unsafe. This high level of vulnerability in the built environment can be attributed to a range of factors, perhaps most importantly to the shortage of trained skilled technicians and craftsmen, a lack of knowledge about safe construction practices and the loss of indigenous building traditions.

HRMP's skill enhancement component focuses on training artisans in safe construction and training female youth in village mapping and documentation. The purpose is to build the resilience of local human resource so that they can spur positive change that contributes to self sustenance in the long run.

HRMP's training programmes help locally trained artisans to replicate safe construction practices in nearby areas while increasing their skill set and income.

Simultaneously, the training Programme for female youth supports them to prepare, cope, recover, rebuild, and protect themselves against future disaster threats. The training includes village mapping, architectural documentation of buildings and computer skill enhancement.

## Seismic Retrofitting

Seismic retrofitting under HRMP involves actions for upgrading the seismic resistance of existing buildings. Seismic retrofitting is a cost effective technology to improve the integrity of the existing building. The main items of seismic retrofitting include:

- Strengthening of foundations,
- Strengthening of walls including provision of horizontal and vertical bands or belts,
- Introduction of 'through' or header stones in thick stone walls, and injection grouting etc,
- Roof repairs,
- Modification in the building plan,
- Addition of sections of beams and columns by casing or jacketing etc.,
- Addition of shear connectors, and
- Plinth protections and damp proofing

## Constructions and Reconstructions

In northern Pakistan vernacular buildings are regularly supplanted with modern building materials and construction technologies. In some cases these modern building materials have a negative effect as



Seismic retrofitting in progress at DJ Primary School, Hasis, Ghizar, Northern Areas, Pakistan 2008. The local community is actively participating in the retrofitting work

“The October 8, 2005 earthquake in South Asia was a cruel reminder of just how vulnerable the region’s schools actually are. Over 17,000 school-age children perished in the collapsed schools, approximately 23% of the total deaths and over 20,000 more suffered serious injuries. Over 80% of schools in Pakistan are unprotected from similar risks.

“School safety needs to become a national priority. Policies, guidelines, implementing and monitoring mechanisms are needed. This translates into actions that address identifying resilient school needs, retrofitting existing structures, creating evacuation plans and safe havens, improving community and student awareness through outreach and simulations. Selection of safe sites, design and construction technologies and materials also apply to the larger built environment.”

Islamabad Declaration, School Safety Conference, Pakistan 2008



they are either too expensive or less environment friendly or their behaviour in disasters is not well understood.

HRMP provides options to local communities for upgrading traditional building systems in ways that are cost effective, disaster resistant, reduce vulnerability and are culturally and socially appropriate. The technology makes little use of factory equipment or imported materials and can be easily self-replicated in relatively poor communities.

### Provision of Technical Advice

The Northern Areas of Pakistan consists of more than 150,000 traditional dwellings of rubble stone masonry or earthen construction. This will increase by approximately 5% every year as rapid urbanization has resulted in a growing demand for basic shelter. There is also an increasing demand for public buildings such as schools, health units etc. Construction technologies for new buildings are not well understood and a lack of land use and strategic planning has placed extreme pressure on the built environment.

To address this habitat vulnerability issue HRMP offers technical solutions in three areas:

- Provide innovative and cost effective retrofitting techniques for existing buildings;
- Develop guidelines on seismic safe construction standards for new buildings;
- Advice on land use planning and structuring community-based infrastructures and lifeline systems (roads, irrigation channels, bridges, potable water supply systems, first aid/basic health units, electricity and communication systems)

### HRMP Achievements

- HRMP has attempted to secure the lives and livelihoods of approximately 13,000 people in the Ishkoman/Ponial Valleys of Northern Areas, Pakistan from future disasters, particularly earthquakes
- Seismic retrofitting of 27 private housing units, 4 schools and 1 hospital has been carried out in District Ghizar of the Northern Areas, Pakistan
- HRMP’s land use planning workshops have benefited thousands of people in the Ghizer district and have set the

foundation for future structural risk mitigation works in other earthquake prone regions of Pakistan.

- 13 local female youth have been trained in village mapping, documentation, hazard mapping and vulnerability assessment in three villages of District Ghizar
- 50 artisans (masons and carpenters) have been trained in safe construction trades and seismic retrofitting
- PRA workshops on DRR have been conducted in three hazard prone villages - Gich, Chatorkhand and Faizabad-Ishkoman
- Disaster Risk Reduction awareness raising workshops and safety drills have been conducted in 15 schools in Northern Areas, Pakistan (962 children and teachers participated)
- The Islamabad Declaration on School Safety 2008 - an outcome of a Conference organized by AKPBS,P and Focus Humanitarian Assistance (Pakistan) - urged the government and civil society to dedicate resources for protecting children through safe school planning and construction.

#### Aga Khan Development Network:

1-3 Avenue de la paix  
1202 Geneva  
Switzerland  
Telephone: +41-22-909-7200  
Facsimile: +41-22-909-7291  
Email: [info@akdn.org](mailto:info@akdn.org) Website: [www.akdn.org](http://www.akdn.org)

#### Chitral Regional Office:

Aga Khan Planning and Building Service, Pakistan, Chitral  
Merajuddin House, Near Govt. High School,  
Balach, Chitral, Pakistan  
Telephone: +92-943-412883, +92-943-413547  
Facsimile: +92-943-413531  
Email: [akpbsp.c@akpbsp.org](mailto:akpbsp.c@akpbsp.org)

#### AKPBS,P Head Office:

Aga Khan Planning and Building Service, Pakistan  
310-311, 3rd Floor, Kassam Court,  
BC-9, Block 5, Clifton, Karachi-75600, Pakistan  
Telephone: +92-21-536-1802, +92-21-536-1803, +92-21-536-1804  
Facsimile: +92-21-536-1807  
Email: [akpbsp.k@akpbsp.org](mailto:akpbsp.k@akpbsp.org)

#### Sindh Project Office:

Aga Khan Planning and Building Service, Pakistan  
C-31, Makli Hashimabad Housing Society,  
Makli, Thatta, Sindh, Pakistan  
Telephone: +92-298-77278  
Email: [akpbsp.s@akpbsp.org](mailto:akpbsp.s@akpbsp.org)

#### Gilgit Regional Office:

Aga Khan Planning and Building Service, Pakistan, Gilgit  
River View Road, Opposite FCNA Helicopter Chowk,  
Jutial, Gilgit, Northern Areas, Pakistan  
Telephone: +92-5811-52819, +92-5811-54266  
Facsimile: +92-5811-55890  
Email: [akpbsp.g@akpbsp.org](mailto:akpbsp.g@akpbsp.org)

#### Balistan Project Office:

Aga Khan Planning and Building Service, Pakistan, Balistan  
Abbas Town, Shaheen Manzil, Near Baltro rest house,  
Skardu, Balistan, Pakistan  
Telephone: +92-5831-50965  
Email: [akpbsp.b@akpbsp.org](mailto:akpbsp.b@akpbsp.org)