



2005-2010 PAKISTAN EARTHQUAKE HOUSING RECONSTRUCTION



POLICY SUMMARY

ERRA's Housing Programme Objective:

Provide financial and technical assistance to affected home owners in AJK and NWFP, in reconstructing or retrofitting their damaged houses, using a home-owner driven, but assisted and inspected construction regime.

1. Ensuring Owner-Driven Housing Reconstruction

(homeowners in charge of rebuilding their own homes)

Providing an enabling environment to builders and homeowners, through:

- Prior training, information, education and communication campaigns.
- Rebuilding with familiar methods and easily accessible materials- ensuring sustainability and cultural preferences in design.
- Providing technical assistance during construction.
- Promoting the use of own labour, salvaged material, and additional resources such as hired trained craftsmen, etc.
- Ensuring building materials supply chains.
- Facilitating the opening of bank accounts, etc.

2. Assisted and Inspected Reconstruction and Retrofitting

- Mobilizing a large number of assistance and inspection (AI) teams for house-to-house outreach
- Disbursing cash grants in tranches, linked to stages of construction and adoption of seismically acceptable standards.
- Tranche disbursement through Banks after progress / quality validation.
- Resources for forming the AI teams and their management structures to be procured through partnership arrangements.

3. Ensuring seismic safety

- Having in place a review and approval mechanism for reconstruction guidelines, structural designs, and training curricula, through the development of reference minimum structural design standards that meet internationally accepted requirements for low cost earthquake resistant housing, such as:
 - Having thinner walls
 - Having lighter roofing
 - Having well connected structural systems
 - Excluding the use of kacha-type construction
- Construction and planning to take into account the results of seismic micro-zoning

4. Ensuring uniform assistance packages-across all programmes and funding sources- and Maximising Outreach-through optimized designs & implementation mechanisms

- Coordinate multiple reconstruction initiatives & standards for equity: ERRA will ensure:
- Application of uniform policies across the board
- Ascertain application of seismic-resistant design standards.
- Ensure full spatial coverage

- Reduce risks of beneficiary double counting of being missed out.
- Provide Cash grants for core housing unit which may not necessarily be proportionate to the replacement value of loss.
- Reconstructing only where necessary-through damage assessment that distinguishes against set criteria, between houses needing reconstruction and those only needing economically feasible restoration / retrofitting.
- Replacement of a destroyed house with a new seismic resistant core unit.
- Restoration and strengthening of damaged house to seismically acceptable standards,
- Rebuilding in-situ – addressing land ownership & availability issues, minimizing relocation costs
- Relocating only where necessary – ie: where risks or hazards remain very high due to
 - Seismicity
 - Topography
 - Soil conditions
 - Other environmental factors
- Enhance program sustainability through parallel efforts on rehabilitation of livelihoods, and physical and social infrastructure

5. Ensuring the judicious use of grants; reducing and managing conflicts and grievances; avoiding socio-economic distortions, inequities and disparities

- Damage assessment criteria to remain consistent across all affected districts. Eligibility criteria to include land title / ownership criteria; in case of tenants include agreements / authorization from owners to rebuild the house
- MOUs to signed with beneficiaries to ensure the judicious and best possible use of the grants, and application of seismic-resistant structural standards.
- Developing and putting in place participatory and inclusive grievance redressal systems.

DAMAGE

ACTIVITIES

- Over 611,000 houses damaged and destroyed (463,000 destroyed, 148,000 damaged). over 80% housing destruction in many villages.
- 30,000 sqm km affected, over 73,000 killed, over 125,000 seriously injured. Severe trauma experienced.
- 18,000 families lost their land due to landslides or left living at extremely high hazard.
- The FRC and ERRA coordinate relief and early recovery activities within 6 months to start reconstruction at the start of Spring 2006 including restoration of access, communications and markets.
- Pilot implementation of the IASC cluster system.
- High rate of complete destruction due to vulnerability of local construction types and lack of seismic detailing in engineered construction in the area.

RESULTS

- Owner driven shelter programme supported with government financial assistance and technical and material assistance from NGOs. 3.5 million people successfully accommodated. No second wave of deaths in the first winter despite severe climate.
- Over 140 organisations participated in shelter cluster coordination along with armed forces, government.
- Shelter support to enable people to stay at origin. Less than 10% moved to IDP camps from hazardous areas.
- Extensive housing debris removed and sorted for salvage within 6 months.
- Preliminary damage and needs assessment carried out within 3 months of the earthquake.
- Housing Reconstruction and Rehabilitation Strategy prepared in time for the first spring building season, based on a broad consultation process.



Chela Bandi village, north of Muzaffarabad, land lost in sliding, severe damage to village, all residents left homeless.



Community moving debris and salvaging materials by hand. Programmes enabled communities to take initiative and start recovery as early as possible.



Traditional stone unreinforced masonry walling with heavy timber and mud roofs. The majority of this type of house collapsed completely.



Reinforced concrete frame buildings were not designed or constructed adequately for earthquakes. Low levels of knowledge, skills or quality control.



The collapse of reinforced concrete and masonry buildings in small towns was as extensive as the damage to weak traditional construction,



The impact of high loss of life and trauma caused many people to change to improved building techniques and to take responsibility for their family's safety.

CHANGE IN HOUSING

ACTIVITIES

- Pre earthquake housing was predominantly unreinforced stone masonry housing with heavy mud and timber flat roofs, many in deteriorated condition.
- 75% destroyed, 25% damaged required significant change for reconstruction to avoid rebuilding vulnerabilities. Extensive salvage materials available.
- Unreinforced masonry not approved by ERRA for reconstruction funding assistance.
- ERRA technical support promoted a range of alternatives including in local materials to optimise salvage and local skills.
- ERRA introduced international best practice in conventional materials and technologies.
- Safer building options promoted in principles not fixed designs to allow families to flexibility to adjust according to site, budget and other criteria.

RESULTS

- ERRA approved a range of 8 construction types, ranging from low to medium cost.
- Over 95% compliant with ERRA standards.
- 55% of houses constructed in new technologies, 45% in improved traditional techniques.
- Improved local technologies more economical in use of materials, 50% reduction in timber required.
- Over 90% change to hipped pitched roofs with potential for rainwater harvesting.
- ERRA standards applied to the government financial assistance leveraged compliance in owner funded construction also. Total estimated over 2 bn USD.
- New construction in the affected areas after ERRA programme continues to adhere to ERRA standards in both improved traditional and new technologies.

DAMAGE ASSESSMENT, INSPECTION, CERTIFICATION

ACTIVITIES

- ERRA damage assessment and inspection carried out by three major partners Army, PPAF, UN-HABITAT all subject to common agreements for consistency.
- Three categories: 1 completely destroyed, 2 partially damaged, 3 minor damage.
- All eligible households sign an ERRA MOU for cash assistance for repair and reconstruction. Cash assistance on equitable basis not compensation based.
- Cash disbursed directly to individual bank accounts
- All new houses inspected at plinth and lintel level, cash assistance tranches subject to stage certification.
- Over 600 Assistance and Inspection (AI) teams provided technical guidance during construction as well as carrying out formal inspection.
- Centralized and transparent information management.
- Success by balancing incentive, support and penalties.

RESULTS

- 611,000 houses assessed as damaged and completely destroyed and registered for ERRA financial assistance.
- Comprehensive damage assessment carried out in 3 months across vast areas. Assessment teams included Government, technical and community representatives.
- Over 500,000 new bank accounts opened.
- Over 1.5 million site inspection visits, including plinth and lintel level certifications.
- Over 2000 inspectors including Army and civilian engineers, supported by information management.
- Copies of all documentation retained by household for transparency. Over 30,000 grievance cases addressed.
- Information management system based on national identity card and developed to form the basis of national cash assistance programmes in future.



Pre-earthquake housing in the affected area unreinforced masonry, large extended family dwelling built on steep slopes, often multi storied.



Large quantities of timber and stone in salvage from traditional buildings. Good quality big section size timber valuable for building, not consumed as fuel.



All properties comprehensively assessed with head of household details recorded in a robust centralized database to support financial management.



House owners present at site for damage assessment. No incentive for owners to increase damage to change from damaged to fully destroyed category.



Mason in front of his own new home in confined masonry. Masons built their own houses very well from high earnings due to reconstruction business.



Improved local technology using locally available materials and salvage. Timber frame with stone and mud infill. ERRA approved technology feasible for many.



Army Engineering Assistance and Inspection (AI) teams in training to ensure consistency in inspection criteria and application of ERRA standards.



UN-HABITAT Assistance and Inspection engineer advising mason, houseowner while construction is underway, to clarify standards required for certification



Houses compliant with ERRA standards but reflecting individual choice in design



Entirely different housing culture established through ERRA reconstruction, and continuing in new post ERRA construction,



Final formal ERRA inspection at lintel level not roof level. Sample roof level completion survey carried out showing over 80% full completion end 2009.



House owner (MOU holder) signs inspection form for confirmation of decision and receipt for financial assistance. All households responsible individually.

TRAINING AND TECHNICAL SUPPORT

ACTIVITIES

- Housing Reconstruction Centres established at district level across the affected area, resource and training.
- Partner Organisations allocated to each union council (sub district unit) to provide field level support.
- Cascade system designed to ensure scale, speed, quality and consistency in training and technical support activities. Support by NSET Nepal.
- Training and skills development prioritised in ERRA strategy for reconstruction and sustainability.
- Training focused on practical skills and field presence of engineers to continuously track issues and support.
- Training was carried out in all ERRA approved technologies for new construction and for retrofitting.
- Formal training was supplemented by on training on model and demonstration buildings, and on site for masons as follow up, reminder and to correct details.

RESULTS

- 11 Housing Reconstruction Centres established.
- 27 Partner Organisations established mobile team technical support in 232 union councils
- 20 Master trainers and 200 NGO engineers trained.
- Over 200,000 attend technical training sessions including over 24,000 trained comprehensively as master masons in hazard resistant construction.
- Over 400 government officials trained, building capacity, institutionalising knowledge and practices.
- Extensive field documentation, research and development supported training curricula and information materials and mainstreaming,
- Over 95% compliance with ERRA standards shows technologies were appropriate and technical training and awareness activities were effective.

SOCIAL MOBILISATION, ORGANISATION, AWARENESS

ACTIVITIES

- Social mobilisation ensured direct engagement by ERRA representatives with affected communities.
- Introduction of ERRA programme, policies, terms and conditions, and safer building awareness in the community as early and widely as possible.
- Formation of village reconstruction committees to organise community collective action in reconstruction and to support the individualised financial support strategy. Committees trained by partner organisations.
- Women included or with separate committees.
- Community meetings identify issues, priorities, questions for ERRA policy decisions and to help the planning of training and awareness activities.
- Door to door assistance to all households to promote safer construction and to respond to issues.

RESULTS

- Over 520,000 people participate in ERRA orientation sessions and awareness activities.
- Over 3,000 village reconstruction committees established and trained for reconstruction and long term risk reduction and disaster management.
- Over 1 million door to door site visits to households.
- More than 1200 community members engaged and trained as staff to implement the programme.
- Frequently asked questions compiled on a quarterly basis and developed into booklets for dissemination.
- Village committees mainstreamed by long term development programmes in many areas.



training for masons at Housing Reconstruction Centre. Training was also carried out at village level. The focus was on practical training to ensure understanding.



ERRA master trainer. Master trainers underwent training of min 6 months including predeployment, on job and upskilling.



Initial introduction of ERRA housing reconstruction programme in a community meeting 2006.



Women's Village Reconstruction Committee providing information, awareness and opportunities for women to share recovery and reconstruction experience.



Technical support included master artisans like this UN-HABITAT steel fixer guiding on site at key stages in construction through practical assistance.



Training sessions were also women to ensure they knew ERRA policies and construction standards practically so they could check for quality assurance.



Social mobilisation activities varied according to context, but had agreed tools and outputs across all affected areas and all implementing partners.



Community meetings to collect issues, concerns, priorities, grievances and suggestions directly from those engaged in reconstruction.



Training technical staff from the Department of Local Government and Rural Development who take over responsibility for rural housing safety in future.



Technical support included extensive field survey, research, identification of good practices and defects to develop appropriate training activities.



Social mobilisation included door to door encouragement and advice by mobile teams to follow up community meetings.



Initial discussions were held with elders and notables in the community before large scale meetings or activities started, engagement on community terms.

VERNACULAR: CULTURE AND SUSTAINABILITY

ACTIVITIES

- Field documentation of traditional architecture and construction practices, including building surveys and consultation with master artisans.
- Assessment of seismic performance through field evidence and engineering analysis in association with national and international experts.
- Development of standards for reconstruction in selected traditional techniques, associated training and information materials, for example model joints.
- Training of engineers and artisans in local technologies regenerating vernacular knowledge and skill base.
- Demonstration buildings, and technical support on site, including quality assurance and solving defects.
- Mainstreaming of indigenous construction in national curricula and disaster management policies.

RESULTS

- ERRA approved Dhajji, Bhattar and Leepa construction.
- Over 165,000 new houses constructed in approved local seismically safer construction technologies. (Note only few such buildings remained pre-earthquake)
- Extensive documentation and research work produced on traditional building types not previously recorded or analysed. Nationally and internationally recognised.
- Over 100,000 participate in technical training and orientation on traditional construction techniques including over 8,000 carpenters in intensive training.
- Extensive regeneration of local knowledge and upgrading of local skills and by migrant artisans from other areas of the country.
- Use of local construction materials and salvage reduced the environmental impact of reconstruction.

DEMONSTRATION BUILDINGS

ACTIVITIES

- Model houses and demonstration buildings constructed in each approved technique, distribution according to local preferences.
- Model houses used for practical training of local masons, carpenters and steel fixers.
- Promotion and awareness community events at key stages in model construction
- Model houses used to produce documentation for the development of training and information materials.
- Model houses provide long term resource and reference in locality to continue awareness.
- Model buildings used for full construction, for repair and retrofitting and partial models to expose key details for information purposes.

RESULTS

- Approximately 200 model houses and 700 demonstration sites completed.
- Over 4800 artisans trained through participation in model construction
- Over 115,000 people attend events and visit model construction sites.
- ERRA documentation of model construction used for national curricula development and information materials for reconstruction in other disasters.
- Model and demo houses helped successfully introduce new techniques into areas without previous knowledge or practice. Accessible information and promotion method showing people safer reconstruction is feasible in their own area.



Traditional Leepa house with shingle roof and open gable, 905 new houses were constructed in the same way in this valley.



One of the few examples of pre earthquake Dhajji construction, used for research purposes in the development of standards for reconstruction,



One of the 128, 500 Dhajji houses timber frame infilled with stone and mud, all walling materials recycled from salvage. Sustainable technique using local skills,



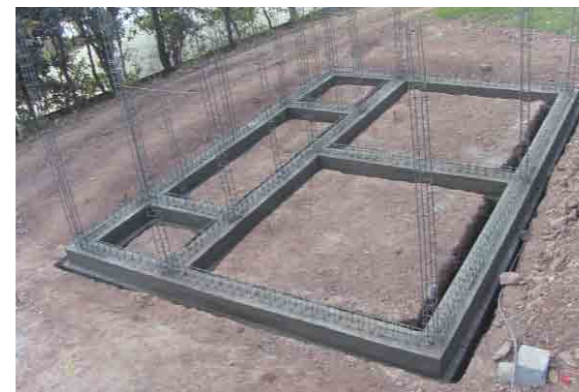
Training at HRC: through stones in masonry, reviving old knowledge the loss of which had contributed to the poor performance of buildings in the earthquake.



Local master carpenters testing the strength of timber joints in compression and tension. engineering research required wide engagement with artisans.



ERRA approved Leepa type construction for appropriate repair, revitalising conservation skills, safeguarding built heritage for future generations.



Confined masonry model house and training site. Site documented for step by step photographs for information materials.



Bhattar construction in east Kashmir introducing an alternative technique in a remote area. Constructed by an experienced mason from another province.



Dhajji house at HRC used for training and promotion at the resource centre.



Demonstration sites included repair and retrofitting work as well as new construction sites.



Training on a demonstration site. Many demo sites were left partially unfinished so the key reinforcement details were visible long term.



Community visit at a demonstration site, to understand compliant standards, and quality assurance issues in material and workmanship.

REPAIR, RETROFITTING AND REMEDIAL MEASURES

ACTIVITIES

- Assessment carried out of types of buildings and types of damage and defects for repair and retrofitting.
- Solutions developed based on international best practice and field testing for practical application, including key innovations.
- Technical support and AI teams trained in techniques to be able to provide appropriate consistent advice and to carry out the work correctly to guide masons.
- Demonstration buildings used to train teams, and to promote acceptance in the community. Extensive ERRA media and awareness campaign.
- Dedicated repair and retrofitting teams established with specialised skills operating on market basis.
- Repair and conservation of culturally significant buildings using appropriate materials and techniques.

RESULTS

- Over 148,000 damaged houses repaired and retrofitted.
- Over 30,000 substandard new houses upgraded through retrofitting to an approved standard of safety and quality for financial assistance.
- Over 450 demonstration sites, over 22,000 masons trained in repair and retrofitting.
- 1872 heritage buildings rehabilitated with ERRA approved conservation techniques.
- ERRA compilation of technical guidance in the catalogue of compliant construction prepared by UN-HABITAT and NESPAK.
- The absence of any one of those factors would likely have meant only a narrow range of conventional technologies were permitted and no local solutions.

SUSTAINABLE HOUSING AND SETTLEMENT

ACTIVITIES

- Analysis of building performance and environmental sustainability issues and priorities carried out with communities for programme development.
- Development of options for improvements and solutions field tested for performance and feedback.
- Building improvement measures activities implemented including training, demonstrations, production of information material, promotion.
- Environmental awareness activities developed and promoted in parallel, including linkages between settlement and environment.
- Issues addressed included: Fuel efficient heating and cooking, insulation, energy, site drainage, sanitation, rainwater harvesting, water filtration, bio gas.
- All activities planned and implemented in partnership with local authorities, NGOs and communities.

RESULTS

- A series of building improvement measures developed including training, information materials, demonstration buildings. Materials developed for long term replication and use in other areas.
- Over 20,000 women trained in the fabrication of fuel efficient stoves.
- An average of 40% reduction in fuel consumption and cooking time.
- Over 5,000 artisans trained in improved rainwater harvesting techniques. Rainwater harvesting practice increased by 400%.
- Training provided to government authorities, 30 NGOs and over 200 CBOs.
- Over 200,000 people participated in outreach activities, including school children.
- Monitoring of replication rates and behaviour change.



House with insufficient and discontinuous lintel is retrofitted with an lintel band, simple and affordable improvement with minimal disruption to the building.



Mason plastering external corner stitch at a demonstration site. Simple solutions were promoted with standardised step by step advice for households.



Repair and retrofitting training at damaged house, Muzaffarabad. High building costs meant retrofitting was usually economical if damage was not severe.



Repair and upgrading of traditional post and beam house, Leepa. These houses performed well in the earthquake, but minor damage needed appropriate repairs.



Community visit retrofitting demonstration site, increased skills and promotion were needed for retrofitting, site visits ensured better explanations.



Defective practices were monitored and targeted in training and information materials and in media campaigns.



Community based analysis of fuel sources and quantities consumed, helping to generate awareness and measure the efficiency of improved stoves.



Improved traditional mud stove, training by and for women, low cost, easily to replicate solutions. Improved stove reduced fuel use by an average of 40%.



Rainwater harvesting on newly reconstructed house, optimizing the potential of new cgi roofs. Rainwater storage tank and first flush tank to the right of picture.



UN-HABITAT trainer demonstrating how to fabricate a corner section for the gutter for rainwater harvesting. Practical training to improve local practices.



English version of posters supporting tree awareness activities in schools and media campaigns, complementing fuel efficient stove promotion and timed to coincide with tree planting season, All in partnership with forestry department.



Plinth improvement and apron under construction, improving site drainage and durability of buildings to extend their lifespan, reduce dampness and increase hazard resistance.

INFORMATION MATERIALS AND MEDIA

ACTIVITIES

- Radio, newspaper, public service announcements, billboards, and other mass communication channels used to promote ERRA messages.
- Posters, flyers, booklets and other print media information materials were developed based on target user involvement and feedback with strong emphasis of visual communication.
- Information messages developed in response to field issues and frequently asked questions, demand driven.
- Information materials developed to supplement training and mobilisation activities providing a reference for households, masons to use for guidance.
- All information used in the programme was subject to ERRA approval to ensure consistency and quality.
- Information penetration monitored.

RESULTS

- All information and media channels used to reinforce and cross reference ERRA messages for safer reconstruction, supplementing and lending authority to social mobilisation and training activities.
- Use of media ensured rapid widescale reach to huge programme area and target populations, including timely updates in a rapidly evolving programme.
- Over 1 million print products disseminated.
- Weekly radio shows addressing current issues produced for the duration of the programme and relayed by local stations in 80% of affected districts.
- ERRA deadlines widely communicated and increased the rate of reconstruction.
- ERRA information materials used for national training activities.

INFORMATION MANAGEMENT

ACTIVITIES

- Over 610,000 individual memorandums of understanding and bank account holders.
- Computerised Information management system to track site visits, certification and financial disbursement, training activities, community mobilisation and information dissemination.
- Online system for speed, accuracy, transparency, accessible for queries. Monitoring and evaluation, grievance redressal systems for quality assurance.
- Information management provided basis for policy decisions and implementation planning, including identification of problems and mapping.
- Quantitative data supplemented by qualitative data.
- Extensive documentation of construction types, practices, details, defects, for wider use.

RESULTS

- Over 500,000 new bank accounts opened.
- Over 3 million site inspection visits documented.
- Over 2 million financial transactions processed, with over 1.3 billion USD disbursed.
- 200,000 queries handled at field and federal level. Robust data management to support redressal.
- Processing time from field inspection to ERRA processing less than 8 weeks.
- Comprehensive data base of damage and reconstruction, building standards, information materials available.
- Information management teams trained and experienced in government authorities and implementing partner organisations.



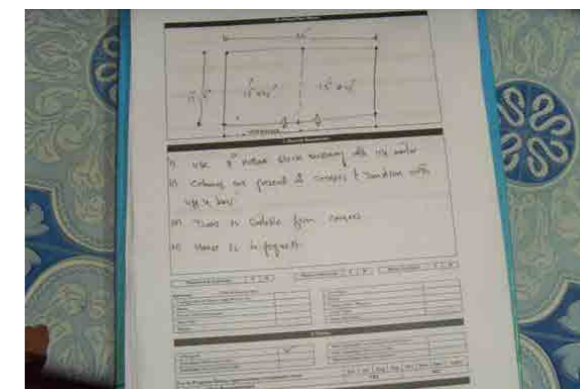
Training engineer on site explains the ERRA guidance poster to the family undertaking reconstruction. Posters and training supplemented each other.



Information material fair in the local market, reaching a wider audience through normal distribution points and channels, and referring people for further advice.



Householder with MOU number in front of his property to confirm identity of both for inspection documentation and verification to avoid duplication.



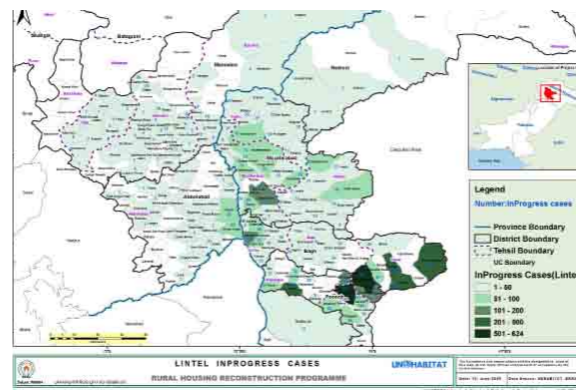
ERRA inspection including notes on building size, layout, quality and issues of non compliance. plus copies of advice issued to householder if any.



Army AI team inspection engineer and his personal copy of the catalogue of compliant construction, ERRA reference document for technical support.



Information materials for repair and retrofitting with step by step advice, user feedback expressed preference for photographs in visual communication.



Extensive use of mapping, assisted overview of the programme, identification and location of problems and prioritisation of technical support.



Photographic records of all houses inspected by PPAF and UN-HABITAT. Data entered online to facilitate efficient processing and retrieval.



Billboards informing people of their local frequency for ERRA radio programmes, and informing people of deadlines for plinth level completion and inspection.



ERRA Information materials used at training and awareness sessions to ensure accuracy in messages and for participants to bring home as reminders.



Extensive hard copy data generated in the field all of which needed to be managed and supported as appropriate with computerised systems.



The Housing Financial Management Information System with personal data, bank details, construction status and financial disbursement status combined. All queries could be answered by reference to this data base.

SOCIAL PROTECTION, VULNERABLE FAMILIES

ACTIVITIES

- Vulnerable families were identified through community mobilisation and village reconstruction committees for technical assistance and support by their own communities in reconstruction.
- Vulnerable families were selected for model and demonstration construction activities, helping to accelerate or complete their houses.
- Vulnerable families were monitored and prioritised for early inspection to accelerate financial assistance.
- The profiles and locations of extremely vulnerable families were tracked by UN-HABITAT.
- ERRA provided an outreach service to identify queries and grievances and resolve difficulties through their complaints department.
- Low income families take up rainwater harvesting and fuel efficiency measures to reduce household costs.

RESULTS

- The completion rate of over 90% and compliance rate of over 95% of houses at lintel level shows that over 90% of families had constructed permanent houses and received full financial assistance from ERRA. The 10% who did not complete includes mostly those who migrated from the area.
- The ERRA approval of local and low cost technologies ensured affordability within the 175,000 PKR assistance for families without other funds.
- Over 1000 vulnerable families assisted through model house construction.
- Building improvement measures achieve significant reductions in household bills and workload, and improve indoor environment benefiting women, elderly and chronically sick.

WOMEN

ACTIVITIES

- Women safeguarded by ERRA to receive financial assistance in housing and land programmes including property ownership.
- Specific programmes of training and awareness for women, including policies and construction standards.
- Village reconstruction committees including women representatives or with women and men's committees
- Women staff employed by all partner organisations to ensure full engagement with women in all activities.
- Programme of building improvements for reconstruction including sanitation, rain water management and fuel efficiency, designed and implemented targeting women.
- Additional technical support by partner organisations for women-headed households to manage reconstruction,

RESULTS

- Approximately 55,000 houses reconstructed by women headed households including those where male family members had migrated for work.
- Over 300 women employed as trainers and community organisers activities in the housing reconstruction programme.
- Over 1300 village reconstruction committees with women representatives
- Over 200,000 women participated in training, awareness and community mobilisation activities.
- Fuel efficiency programmes reduced cooking time and fuel consumption by 30-50%.
- ERRA housing programme impact evaluation study showed the greatest change after risk reduction was an improvement in the perception and empowerment of women in the family and community.



Elderly widow (right) and her daughter in emergency shelter at very high altitude winter 2005/6. Very low income family in remote and poor area.



The same elderly widow (right) in front of her completed 3 room Dhajji house in July 2008. ERRA assistance was adequate to cover reconstruction costs.



Women headed households faced the challenge of organising materials and labour. With access to finance and technical advice they managed successfully.



Women were often the only member of the family at home all day, and played a vital role in supervising masons, and quality assurance, using skills from training.



Very low income families in remote areas managed to construct basic ERRA approved houses, and can upgrade or extend in future according to resources.



Women headed households experienced difficulties to manage reconstruction but received additional technical support from partner organisations.



Shaheen Gillani UN-HABITAT trainer explaining seismic resistance measures at a women's session on a demonstration site.



Orientation sessions for women provided important opportunities to meet, discuss their experience, ask questions and gain knowledge for reconstruction.



The approval of safer and improved local technologies by ERRA ensured reconstruction was affordable by low income families, including use of salvage.



ERRA billboard in prominent location, informing on grievance redressal and query processes for those experiencing difficulties in reconstruction.



ERRA programme engineer explaining retrofitting measures to women's group. Women were important to plan the budgets and therefore investment in safety



Traditionally women carried out plastering and finishing of houses. The regeneration of local technologies was matched with reviving these skills.

URBAN ACTIVITIES

ACTIVITIES

- Hazard mapping, microzonation and urban planning carried out by ERRA with local authorities.
- Over 10,000 urban households receive ERRA cash assistance for housing reconstruction.
- Urban housing reconstruction supported by ERRA rural housing reconstruction teams and activities including facilitating coordination of a wide range of stakeholders around urban housing safety issues.
- 30 urban authority staff technical and management staff trained by ERRA teams, staff seconded to support urban authorities
- New construction and retrofitting demonstrations, material testing and advice sessions at various locations throughout the city.
- Information and media campaigns for safer construction and quality assurance for urban housing.

RESULTS

- 4 city masterplans produced within 18 months.
- Full financial assistance disbursed to affected households.
- Temporary shelter assistance provided to vulnerable urban families.
- Urban authorities strengthened in capacity and in planning and building control.
- Series of targeted events with participation by 16,000 urban residents, including target groups of students, women, technical professionals, contractors, masons, traders and property owners.
- Urban specific technical advice, training and information materials developed, produced and disseminated.
- Initial progress in urban community based responsibility for disaster management.

AFTER ERRA, RECONSTRUCTION & RISK REDUCTION

ACTIVITIES

- Government officials and ERRA programme staff have been involved in response to shelter and reconstruction following: floods, cyclones, landslides and earthquakes from Gilgit Baltistan to Sindh in all provinces.
- Hazard resistant design and construction has been incorporated into the national engineering and vocational training curricula through ERRA activities.
- ERRA personnel, housing policies and standards institutionalised into the National Disaster Management Authority (NDMA) and provincial authorities.
- ERRA based experience used to inform long term housing and urban development policies.
- ERRA experience contributes to shelter cluster policies and activities in early recovery.

RESULTS

- Over 20 million people have lost their homes in disasters in Pakistan 2006-2010.
- Over 500 ERRA personnel trained in housing reconstruction have been involved in other disaster recovery in Pakistan, employed by over 40 organisations.
- ERRA trained team devised construction standards and information materials for post earthquake and post flood reconstruction in other provinces for NDMA.
- Over 20 universities and technical colleges implementing new curricula incorporating hazard.
- ERRA experience in cash disbursement and information management have formed the basis for 2009 conflict and 2010 disaster reconstruction programmes



Damage in Muzaffarabad city centre, over 10,000 killed in city of around 130,000 persons, and extensive damage to public and private buildings.



Training structural engineer explains construction defects to municipality engineers, contractors and local masons and steel fixers.



ERRA programme engineer carries out consultation on local practices with masons in Baluchistan post earthquake 2008.



ERRA programme architect assessing urban damage post monsoon flood with the community in Muzaffargarh, Punjab 2010.



Facilitation of cooperation and coordination between various government departments and urban organisations, 'Safer Houses, Safer Residents' events.



Urban area billboards at busy bus park to promote the message: 'Your safety is in the hands of your mason, use an earthquake trained mason for a safer future'.



Cyclone flood affected areas 2007, ERRA teams supported housing, land and social protection damage and needs assessment.



Monsoon flood 2010, ERRA teams carried out official technical surveys of housing types, damage and needs and prepared standards for reconstruction.



Demonstration construction at municipality offices and other locations in the city for training information and promotion of safer building.



Community orientation, youth sessions, debate and discussion sessions to support ward level awareness of planning and building control issues.



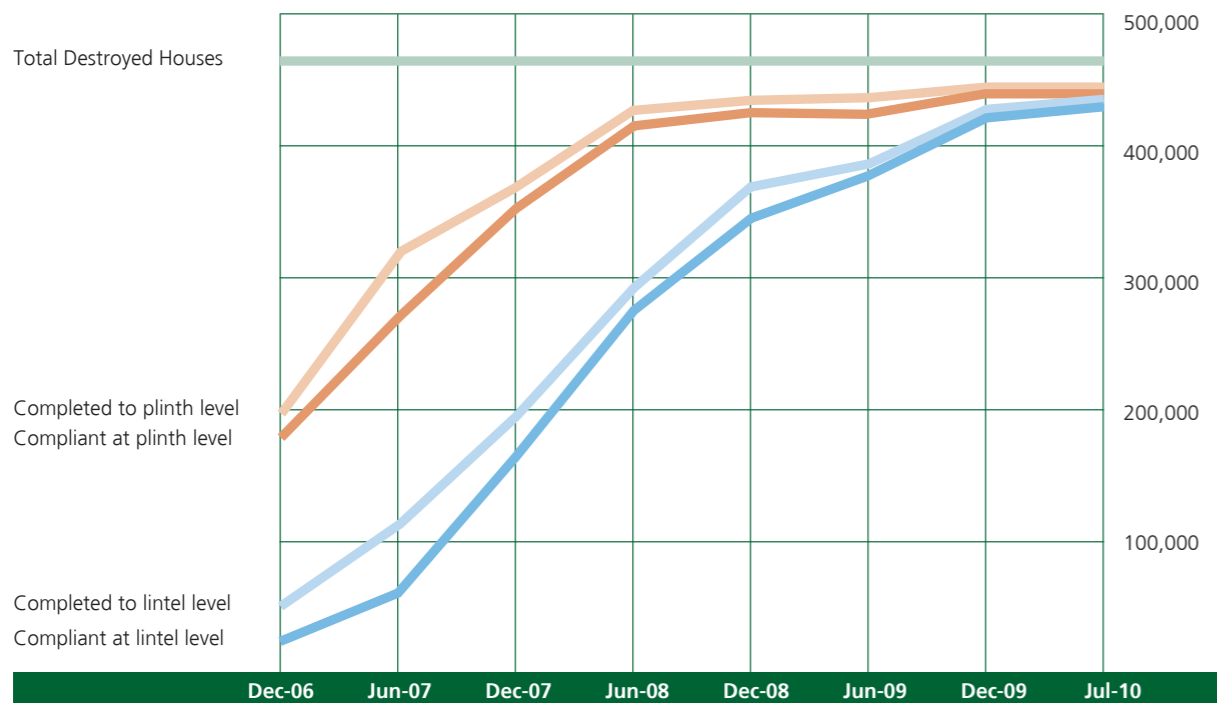
Earthquake Baluchistan 2008, ERRA teams carried detailed technical assessment, developed standards for reconstruction and supported early recovery



ERRA teams are engaged in urban housing development and upgrading in association with national government, municipal authorities and communities

PROGRESS 2006-2010

HOUSING RECONSTRUCTION DATA								
	Dec-06	Jun-07	Dec-07	Jun-08	Dec-08	Jun-09	Dec-09	Jul-10
Total Destroyed Houses	463,403							
Completed to plinth level	199,931	312,213	373,812	419,874	429,735	434,609	439,027	439,075
Completed to lintel level	47,076	109,002	197,795	298,150	364,913	389,478	418,662	418,726
Compliant at plinth level	173,880	267,777	354,078	414,492	421,202	425,859	438,679	438,761
Compliant at lintel level	36,407	61,536	167,957	275,478	339,471	373,714	417,296	417,610



PROGRESS

■ Stage 1. April 2006-December 2006 Planning, Preparation and Mobilization.

Government Authorities and Implementing Partners developed policies, strategies, standards, mobilized trained and established capacity. Households were busy dealing with immediate needs, sorting salvage materials, and mobilizing funds, labour and materials for construction. This stage always show a relatively slow start in results on the ground because of the scale and complexity of preparations and inputs required. Nonetheless over 43% of plinths were completed by the end of 2006, showing the determination of households to rebuild their homes and lives as soon as possible. The preparation phase allowed time to ensure that communities were informed about the ERRA programme, aware of safer building and that masons could be trained in time before full speed reconstruction. Key policies were in place and preparation ready for 2007.

■ Stage 2. January 2007-December 2008 Full Speed Reconstruction.

The second stage from December 2006 to December 2008 describes the reconstruction work on ground at an accelerated and steady pace of progress. From the early Spring 2007, the majority of households were able to start their work on site. The number of plinths grew from 200,000 Dec 06 to 312,000 by June 07. The number of lintel level completions grew from 47,076 in Dec 06 to 197,795 in Dec 07. The pace continued at this very fast rate until the end of December 2008 by which time 364,913 lintels were completed. The rate of reconstruction required significant material and labour supply issues. ERRA material hubs and training tried to address the scale of demand, but the simultaneous work and remote locations caused severe constraints particularly for transport. The progress achieved is remarkable also considering the additional problems of long winter snow fall, heavy monsoon rains in summer and water shortages in late 2007. This was an owner driven reconstruction programme, which had to monitor and respond to rapidly evolving field issues to keep both construction progress and quality to the required levels. The fast rate of construction and the geographic variation in materials and technologies resulted in many technical issues to be addressed by ERRA, NESPAK and UN-HABITAT including additional housing designs, guidance on material quality control, and solutions for defective construction. By June 2007, only 56% of houses were found to be compliant at lintel. Solutions for remedial measures, targeted advice, technical support and revisions to standards ensured that by December 2008 this percentage had increased dramatically to 93% compliant and eligible for final payment.

■ Stage 3. December 2008-December 2010 Completion, Building Improvements Institutionalisation

The last stage of reconstruction included those who for various reasons started later or progressed more slowly. This included support to vulnerable households and complex construction problems as the last caseload outside of completion and compliance. Targeted and bespoke solutions were needed and in this stage beneficiaries are more dispersed, requiring more time and effort to reach. It is most important to sustain support and programme services to proper completion to ensure the most needy can access financial support and to maximize all feasible completion and compliance. A programme of building improvements including sanitation, rainwater harvesting, fuel efficiency and insulation, plinth protection and durability improvements was devised according to various shortcomings in construction and opportunities arising. Technical support teams in place to complete hazard resistance advice and certification diversified the range of housing support using the same tools of training and awareness. Safer and environmentally sustainable housing and settlement activities linked the natural resource management, building and materials, risk and vulnerability. The completion phase included the resolution of outstanding cases and the preparation for any subsequent handling of programme related issues and communication of the completion strategy by concerned authorities and implementing partners. The owner driven housing reconstruction programme set out to inculcate a new culture of safer construction. The completion stage included transfer of knowledge, skills and lessons learned to long term stakeholders in rural housing and risk management for sustainability and to build on experience within the country and internationally including contributing to the unprecedented monsoon floods 2010.

LIST

■ Funding Partners

Agence Française de Développement (AFD) Asian Development Bank (ADB) Belgian Government Canadian International Development Agency (CIDA) Department for International Development (DfID) UKaid German Technical Cooperation (GTZ) Government of the Islamic Republic of Pakistan Irish Aid Islamic Development Bank Kreditanstalt für Wiederaufbau Bankengruppe (KfW) Office of United States Foreign Disaster Assistance (OFDA) Private Donations Swedish International Development Agency (SIDA) Swiss Agency for Development and Cooperation (SDC) United States Agency for International Development (USAID) World Bank (WB)

■ Implementing Partners

Aga Khan Development Network (AKDN) Agency for Technical Cooperation and Development (ACTED) Basic Education and Employable Skill Training (BEST) Begian Red Cross (BRC) CARE International Earthquake Reconstruction and Rehabilitation Authority (ERRA) Emergency Architects (EA) French Red Cross (FRC) German Tehcnical Cooperation (GTZ) GOAL Ireland Habitat for Humanity (HfH) International Blue Crescent -Turkey (IBC) International Organisation for Migration (IOM) International Relief Committee (IRC) Islamic Relief (IR) Johanniter- Unfall- Hilfe Mercy Corps International (MCI) Omar Asghar Khan Development Foundation (OAKDF) National Rural Support Programme (NRSP) National Society for Earthquake Technology (Nepal) (NSET) Pakistan Army Poverty Alleviation Fund (PPAF) Partner Aid International (PAI) Première Urgence (PU) Provincial Earthquake Reconstruction and Rehabilitation Authority (PERRA) Rural Support Programmes Network (RSPN) Sarshad Rural Support Programme (SRSP) Shelter for Life State Earthquake Reconstruction and Rehabilitation Authority (SERRA) Sungi Development Fund Swiss Agency for Development and Cooperation (SDC) The Citizens Foundation United Nations Development Programme (UNDP) United Nations Human Settlements Programme (UN-HABITAT) Women's Welfare Organization Pakistan (WWOP)

■ Partners for Technical Expertise

National Engineering Services Pakistan (NESPAK) National Society for Earthquake Technology (Nepal) (NSET) United Nations Human Settlements Programme (UN-HABITAT) Swiss Agency for Development and Cooperation (SDC) Pakistan Poverty Alleviation Fund (PPAF) University of Engineering and Technology Peshawar Emergency Architects BGS Ingenieurconsultant International GOAL Ireland Pro Bono technical expertise and support from a number of individual earthquake engineers, architects and specialists and their companies

■ Partners for Social Mobilisation and Public Information

ATV Pakistan Television Azad Jammu and Kashmir Rural Support Programme (AJK-RSP) Coffee Communications FM 99 Abbottabad FM 100 Islamabad FM 105 Azad Jammu and Kashmir National Rural Support Programme (NRSP) Pakistan Broadcasting Corporation Rural Support Programmes Network (RSPN) Strengthening Participatory Organization (SPO) United National Human Settlements Programme (UN-HABITAT)

