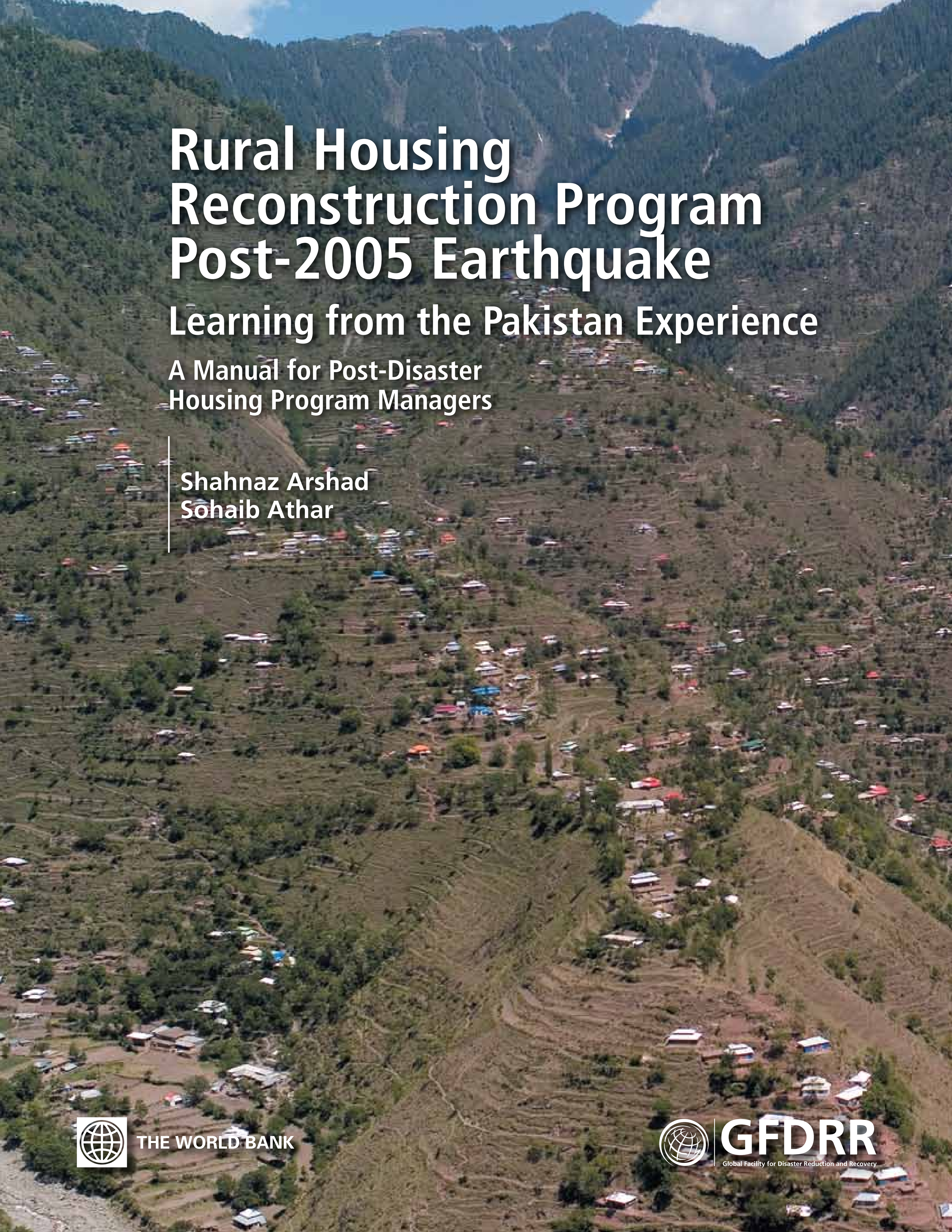

Rural Housing Reconstruction Program Post-2005 Earthquake

Learning from the Pakistan Experience

A Manual for Post-Disaster Housing Program Managers

Shahnaz Arshad
Sohaib Athar

THE WORLD BANK

GFDRR
Global Facility for Disaster Reduction and Recovery

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1. Rural Housing – Reconstruction Program – Manual for Post-Disaster

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Abbreviations

AI	Assistance and Inspection
AJK	Azad Jammu and Kashmir
CSO	Civil Society Organization
DRC	Data Resource Centre
DNA	Damage and Needs Assessment
ERRA	Earthquake Reconstruction and Rehabilitation Authority
FRC	Federal Relief Commission
GRM	Grievance Redressal Mechanism
HRC	Housing Reconstruction Centre
HSWG	Housing Strategic Working Group
ICT	Information and Communication Technology
KP	Khyber Pakhtunkhwa
MoU	Memorandum of Understanding
NADRA	National Database and Registration Authority
NCRS	Non-Compliant Referral System
NDMA	National Disaster Management Authority
NIC	National Identity Card
NGO	Non-Governmental Organization
PDMA	Provincial Disaster Management Authority
PERRA	Provincial Earthquake Reconstruction and Rehabilitation Agency
PO	Partner Organization
PPAF	Pakistan Poverty Alleviation Fund
RHRP	Rural Housing Reconstruction Program
RME	Reporting, Monitoring and Evaluation
SERRA	State Reconstruction and Rehabilitation Agency
SOP	Standard Operating Procedures
TSS	Temporary Shelter Support
UC	Union Council
VRC	Village Reconstruction Committee

Acknowledgements

The 2005 earthquake in Pakistan was a cataclysmic event. The unprecedented loss of life and property, and devastation inflicted across a vast mountainous terrain presented an unparalleled challenge to national and international partners for effective relief, recovery, and reconstruction. The challenge was not just met, but surpassed, by the organizations, agencies, and individuals who participated in the massive recovery and reconstruction effort, including in the housing sector.

While the World Bank led development of the policy and strategic framework for the Rural Housing Reconstruction Program, and contributed US$210 million in technical and financial assistance out of the US$1.5 billion needed, multiple stakeholders played critical roles in its successful implementation. Many of them have contributed to the development of this Manual by generously sharing information, training materials, graphics, and photographs. The authors would like to express their deep appreciation for their contributions.

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Emerging clusters of seismic-resistant houses adorning the landscape.

Executive Summary

What is this Manual About?

This Manual is a guide for those tasked with responding to post-disaster housing reconstruction needs. It details the various processes, tasks, and interventions involved in the design and management of such programs. It uses Pakistan's post-earthquake Rural Housing Reconstruction Program (RHRP) as a case study, and draws on the experience and lessons from that to derive recommendations for future post-disaster housing reconstruction programs. The manual also provides a strong results-based outlook through a results framework that links desired impacts, program level and intermediate outcomes, and outputs into a coherent whole.

Pakistan's Rural Housing Reconstruction Program

The October 2005 earthquake in Pakistan killed over 73,000 people and left more than 2.8 million in need of shelter. In response the Government of Pakistan, in collaboration with international partners, launched the Rural Housing Reconstruction Program (RHRP) at a cost of over US$1.5 billion. This included technical and financial assistance of US$210 million from the World Bank.

RHRP relied on an owner-driven mechanism providing multi-tranche financial support to beneficiary households, based on assistance, inspection, and certification at various stages of construction to ensure compliance with seismic-resistant standards. The housing grants financed both replacement of completely destroyed houses with new seismic-resistant core units, and repair of damaged houses to seismically acceptable standards. A Detailed Damage Assessment and Eligibility Verification Survey was conducted to develop verified beneficiary lists. Grant disbursements were channelled through commercial banks directly into beneficiary bank accounts. Partner organizations provided technical assistance for reconstruction and rehabilitation. In total PKR 86 billion were disbursed through RHRP and, by end 2008, 94 percent of reconstructed houses were compliant to seismic-resistant standards up to lintel level.

The various components of Pakistan's RHRP, the lessons learned from its experience and recommendations for future such programs are summarized below:

A) Program Guiding Principles and Strategy

Pakistan Experience: The Guiding Principles and accompanying strategies underpinning the RHRP were decided based on international experience as well as the specific context of the Pakistan earthquake, and were as follows:

1. Ensuring owner-driven housing reconstruction;
2. Assisted and Inspected reconstruction & restoration regime;
3. Ensuring seismic safety;
4. Ensuring uniform principles and assistance packages across all funding sources and maximizing outreach;
5. Ensuring judicious use of grants; reducing and managing conflicts and grievances; avoiding socio-economic distortions, inequities and disparities.

Recommendations: As soon as the details of a disaster and its impact start emerging, reconstruction strategy formulation needs to begin. This strategy needs to identify key decisions that have to be made regarding reconstruction: the implementing agency and institutional arrangements, eligibility criteria, and assistance entitlements.

B) Institutional Arrangements for Rural Housing Reconstruction

Pakistan Experience: Within a month of the disaster, the Earthquake Reconstruction and Rehabilitation Agency (ERRA) was set up with a clear mandate to manage post-disaster recovery and reconstruction across the 12 affected sectors. The agency coordinated all assistance through a 'one-window' mechanism. All stakeholders of the RHRP were obliged to work through it. ERRA also created strong linkages with existing national-level institutions to assist in the implementation of various elements of the reconstruction program.

Lesson learned: Political support is crucial, but drops over time. The absence of government leadership is one of the greatest risks in responses, at times more problematic than resource deficiencies.

Recommendations: Set up a dedicated Reconstruction Agency as soon as possible. It is extremely important to have an appropriate institutional mechanism with requisite authority, clear mandate and necessary resources in place as quickly as possible. Governments should take an early and active role in the response, showing political commitment.

C) Detailed Damage Assessment and Beneficiary Eligibility Verification Survey

Pakistan Experience: A preliminary damage assessment by local authorities was followed by a comprehensive door-to-door assessment covering the entire affected area. There were insufficient suitable consulting firms or Non-Governmental Organizations (NGO) with requisite wherewithal to carry out this task, so the Pakistan military was brought in. Over 600 teams conducted the survey, each led by a military engineer, and comprising a representative of the local community and a government functionary such as a revenue official or a teacher. The results were compiled to create a central database of beneficiaries, which was linked to the existing national identity database of NADRA. Alongside conducting the survey, the teams signed MoUs with verified beneficiaries specifying the purpose of the grant and mutual responsibilities.

Lessons learned: Carrying out damage assessment and eligibility verification as a single exercise accelerates the process, mitigates risk of error, and ensures transparency and equitability.

Recommendation: Assessment should happen once, and be clear and conclusive. A detailed survey is critical to ascertain the scope and extent of damage to the housing stock against uniformly applied engineering criteria, and to validate the authenticity of beneficiaries. A single survey exercise should combine the following three separate activities to enable efficient use of resources:

- Comprehensive damage assessment, to determine nature of damage to each surveyed dwelling;
- Beneficiary eligibility verification;
- Signing of a quasi-legal agreement (MoU) with the verified beneficiaries stipulating mutual responsibilities, and purpose of grants.

D) Transparent Mechanism for Grant Payments to Beneficiary

Pakistan Experience: A multi-tranche grant payment mechanism was developed that was closely tied to beneficiary eligibility as well the inspection and certification regime. Beneficiary households received financial assistance in tranches; the first tranche was released upon beneficiary verification, while subsequent releases were dependent upon them meeting criteria for seismic-resistant reconstruction agreed to in the initial MoU.

Lessons Learned: Many beneficiaries did not have bank accounts and lived in remote areas. A strong effort was needed to mobilize commercial banks and other financial entities to facilitate expedited opening of bank accounts. Most grievances and complaints are likely to relate to establishment of eligibility and financial assistance.

Recommendations: Payment mechanisms that entail release of grants in tranches, subject to compliance with seismic-resistant housing standards, can greatly enhance compliance. If possible, grant payments should be released directly into beneficiary bank accounts to ensure transparency and reduce the risk of leakages. Financial assistance should be tied to robust grievance redress mechanisms.

E) Development of Seismic-resistant Structural Designs

Pakistan Experience: The large scale devastation caused by the 2005 earthquake provided a window of opportunity to improve the prevalent methods and quality of construction. The guiding motto of the reconstruction effort was 'build back better'. A menu of seismic-resistant structural designs was developed, based on familiar materials already prevalent in the region.

Lessons Learned: <u>People build early; policies and strategies are always catching up with them.</u> Housing reconstruction starts earlier than other sectors. It is important that policies, standards, and support systems are devised and in place in time to ensure that people are aware of the terms and conditions of financial support, and can access technical advice in time to use it.

Recommendations: Develop appropriate structural design standards using local materials and knowledge. This will require a review and assessment of prevalent materials and methods, especially including documentation of common vulnerabilities due to defective construction practices. Development of designs should be part of a two-pronged strategy, the other part being training (see below).

F) Training and Capacity Building in Seismic-resistant Construction

Pakistan Experience: Training materials and curricula were developed for various target groups (e.g. architects, masons, community members). A 'cascaded training' approach was used to train a critical mass of artisans and craftsmen in the affected area in seismic-resistant construction techniques. Model houses and demonstration structural details were also set up at field level.

Lessons Learned: International experience in training on seismic-resistant construction techniques, provided by a team of experts from Nepal, proved invaluable in developing training curricula. The building boom in the disaster-affected areas attracted unskilled individuals to join the construction sector, exacerbating the need for training.

Recommendations: In order to achieve the objective of improving the quality of housing reconstruction and incorporating necessary disaster risk resistant features, training needs to be provided to craftsmen and artisans involved in the reconstruction process. Otherwise it is likely that houses will be rebuilt as before, leaving households vulnerable to hazard risks. A cascaded training model can be an efficient and effective way of training large numbers of people across a wide area.

G) Assistance, Inspection and Certification of Seismic-resistant Construction

Pakistan Experience: Since the release of housing grant tranches was conditional on adherence to seismic-resistant construction standards, an independent regime of assistance, inspection, and certification was set up. Over 600 Assistance and Inspection (AI) teams were mobilized across the affected area for the entire duration of the Program. The teams were also provided training to carry out their roles. Inputs from these teams were then linked with the beneficiary database to release grant tranches electronically.

Lesson Learned: <u>Dealing with non-compliance</u> is essential in achieving Program objectives. The AI teams advised beneficiaries on necessary improvements to achieve compliance and, in cases where beneficiaries could not independently rectify defects, arranged for technical assistance to be provided by partner organizations working in the area. The AI teams largely comprised the same members as the original survey teams; hence they already had familiarity with the area and communities assigned to them.

Recommendation: An assistance, inspection and certification regime should be set up with the dual role of monitoring compliance with disaster-resistant housing standards, *and* helping non-compliant beneficiaries to rectify their houses and achieve compliance.

H) Effective Public Information Campaigns

Pakistan Experience: Two kinds of information material were developed for the Program: a) general material for mass media (radio, TV, print) to enhance Program knowledge and deliver key messages to beneficiaries and various stakeholders; and b) technical information materials (e.g. training materials, drawings, posters) for various target groups outlining technical standards on seismic-resistant construction. All information release was controlled by ERRA, thereby ensuring consistency in the messages conveyed.

Lesson Learned: Retrieving messages already disseminated is very difficult. While strong measures for consistency were set in place, some unauthorized guidelines on construction standards did get introduced, resulting in some initial reconstruction activity not following approved standards. Among visual tools, all groups expressed preference for photographs.

Recommendations: The need for reliable information in the aftermath of a disaster cannot be over-stressed. Messages need to be consistent. Hence strong systems for authorization of information materials release, and for coordination among diverse organizations involved, need to be established. A variety of communication tools should be used, appropriate to the context (levels of literacy, access to media, etc).

I) Creating a Building Materials Supply Chain

Pakistan Experience: To counter potential shortages in availability of building materials, price increases and difficulties in accessing materials in remote areas (leading to high transportation costs), the Program helped set up a building materials supply chain and materials hubs with the collaboration of the private sector. These were designed to ensure consistent and fair-priced supply of required materials across the affected area. The hubs represented an expansion rather than replacement of the private sector, and hence did not distort markets.

Lessons Learned: Private sector-led materials hubs tend to be located near existing markets. The creation of building materials hubs did not resolve the problem of limited supply in secondary centres and remote areas.

Recommendations: Construction activity increases manifold in post-disaster settings, which can lead to a shortage of required building materials and an increase in their price. Communities that are rural and/or remote can also incur significant transportation costs for reconstruction materials. These factors will erode the purchasing power of disaster-affected households, particularly if provided with fixed financial assistance. Efforts need to be made to ensure adequate supply of fair-priced materials. Involving the private sector can help ensure these do not distort markets. However, special measures will be needed to ensure cost-effective access to materials for people in remote areas.

J) Community Mobilization

Pakistan Experience: ERRA tasked Partner Organizations (which were also responsible for capacity building at field level on seismic-resistant reconstruction) with social mobilization activities in affected villages. The Program strategy provided consistent messages and outlined common outputs for social mobilization (and trained social mobilization teams), but left Partner Organizations to achieve them using their own best practices and approaches. Village Reconstruction Committees (VRCs) were formed to support this effort.

Lessons Learned: The partner organizations, mainly local NGOs, often had prior experience with this nature of work and thus provided valuable expertise in community mobilization. VRCs played a facilitation role but lacked authority over households, at times undermining their effectiveness.

Recommendations: Community participation is a necessary and integral component of development. Strong and continuous community and social mobilization will be needed to harness the collective strengths of communities in understanding and propagating the reconstruction program principles and ensuring sustainability of program objectives. This will require systematic planning and implementation of mobilization strategies.

K) Social Aspects

Pakistan Experience: RHRP ensured that women-headed households and orphan households also received financial assistance. Under the Landless Program, financial assistance was provided to households without land or who had lost/had rendered hazardous their land due to the earthquake.

Reconstruction grants were provided on the basis of houses and not households; in cases where more than one family lived under one roof, the grant was provided to the owner subject to agreement by other family members.

Recommendations: It is critical to understand the social dynamics in post-disaster settings and account for these, so as to ensure that reconstruction programs do not exacerbate existing social inequities. Ideally a program should be empowering in nature, but at the very least it should ensure that it is not leaving vulnerable groups even more disadvantaged.

L) Grievance Redress Mechanisms

Pakistan Experience: In order to ensure equity, a formal mechanism was developed that streamlined the handling and resolution of complaints and grievances faced by beneficiaries. It was a simple, low-cost, and automated system and was based on four tiers: community/village, sub-district, and district (where appeals could be made), and ERRA, which centrally tracked data on complaints redress to determine trends and problems. A number of district-level Data Resource Centres (DRCs) were also established in the affected areas to deal with certain kinds of complaints and grievances related to personal and financial data.

Lessons Learned: The grievance redress mechanism also ensured quality control and a built-in monitoring and evaluation function for the Program.

Recommendations: In order to ensure the principle of equity in the operation of a reconstruction program involving a large number of affected households, and enhance the legitimacy of the program for its beneficiaries, a formal mechanism needs to be developed that streamlines the handling and resolution of complaints and grievances faced by beneficiaries.

M) Reporting, Monitoring and Evaluation

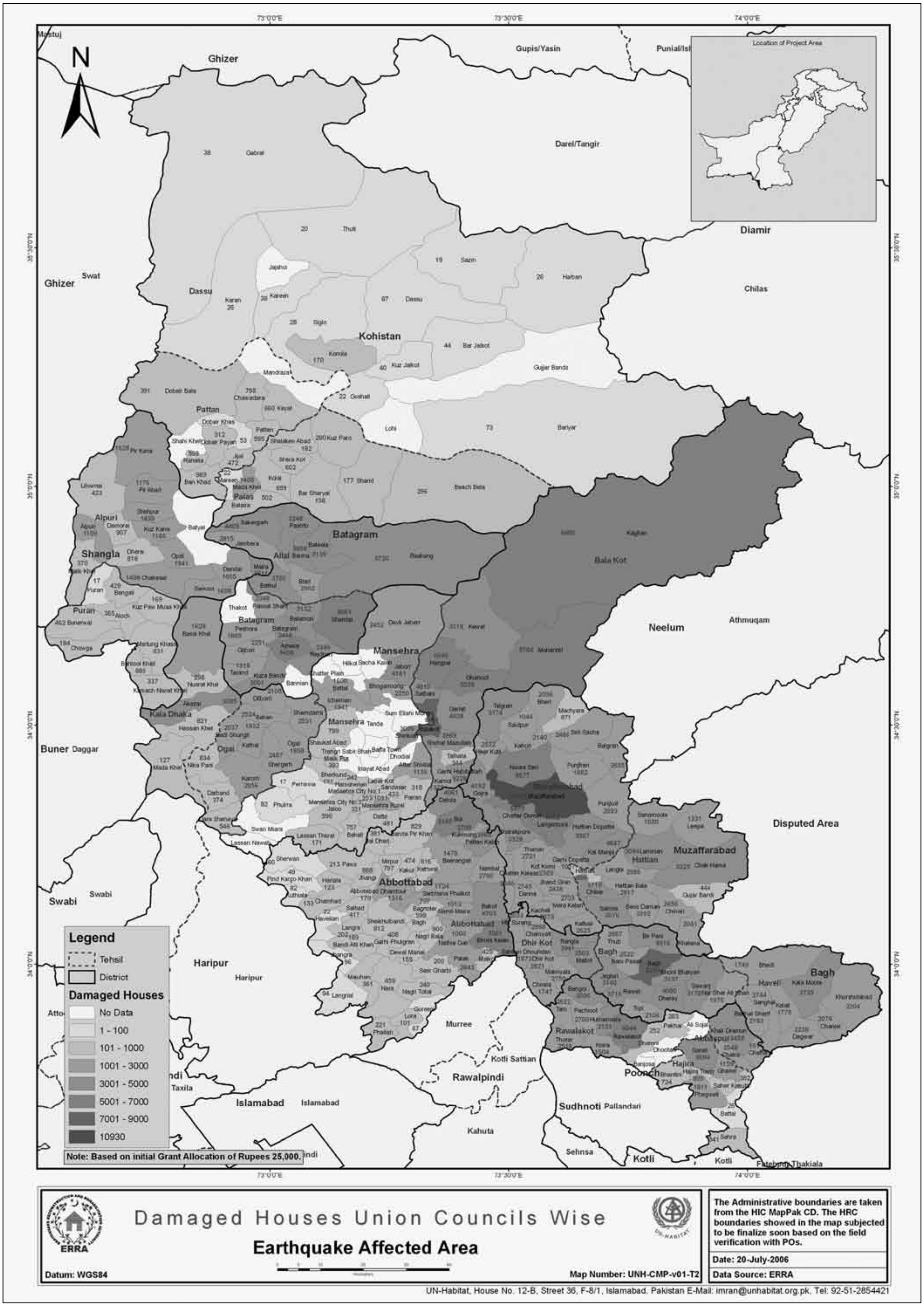
Pakistan Experience: The Program developed a comprehensive Reporting, Monitoring, and Evaluation (RME) system to function in a coordinated manner to standardise and compile all data streams related to reconstruction data, seismic compliance, and technical support activities. This provided reporting on a disaggregated level on key program outcomes, and was used to make information available to a range of stakeholders for Program analysis, planning, and course corrections.

Lesson Learned: All forms and methodologies were standardised, making processing and compilation easier, and ERRA retained centralised control providing accountability and reducing confusion or parallel systems. Indicators determined monitoring priorities. The Program measured rates of compliant completion of houses, and financial disbursement – its formal indicators – but several other aspects of reconstruction (e.g. cost of reconstruction) were formally tracked only retroactively to inform policy development.

Recommendations: An outcomes-based information management system can play a central role in the overall management and implementation of a post-disaster reconstruction program. A robust system will be needed to manage the scale of construction activity, information flows, and financial resources. RME systems built on information and communication technologies (ICT) can help ensure that field information is systematically processed to track progress, and ensure that policymakers can make the program a dynamic, field-driven model, improving the chances of successful achievement of program objectives.

The program brought about major improvements in the quality of building construction, introducing a culture of seismic-resistance.

Introduction


Damaged Houses Union Councils Wise
Earthquake Affected Area
Legend
Tehsil
District
Damaged Houses
No Data
1 - 100
101 - 1000
1001 - 3000
3001 - 5000
5001 - 7000
7001 - 9000
10930
Note: Based on initial Grant Allocation of Rupees 25,000.
Location of Project Area
N
Ghizer
Gupis/Yasin
Darel/Tangir
Diamir
Chilas
Swat
Dassu
Kohistan
Pattan
Palas
Alpuri
Shangla
Puran
Batagram
Allai
Bala Kot
Neelum
Athmuqam
Mansehra
Oghi
Buner
Daggar
Abbottabad
Swabi
Haripur
Murree
Rawalpindi
Kotli Sattian
Islamabad
Taxila
Kahuta
Muzaffarabad
Hattian
Bagh
Dhir Kot
Rawalakot
Hajira
Abbaspur
Poonch
Sudhnoti
Pallandari
Sehnsa
Kotli
Disputed Area
The Administrative boundaries are taken from the HIC MapPak CD. The HRC boundaries showed in the map subjected to be finalize soon based on the field verification with POs.
Date: 20-July-2006
Data Source: ERRA
Datum: WGS84
Map Number: UNH-CMP-v01-T2
ERRA
UN-HABITAT
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Introduction

Background: The Disaster and its Scale

The earthquake that struck northern parts of Pakistan on the morning of October 8, 2005 left widespread destruction in its wake, killing at least 73,000 people, severely injuring another 70,000, and leaving an estimated 2.8 million people in need of shelter at the onset of a harsh winter, in rural, difficult to access terrain.

The earthquake affected nine districts in Khyber Pakhtunkhwa (KP) province and Azad Jammu & Kashmir (AJK) state, covering an area of approximately 30,000 square kilometres of rough and inhospitable terrain. Economic assets and infrastructure suffered extensive damage, with social service delivery, commerce, and communications either debilitated or completely destroyed. Vulnerable groups, mainly women and children living in inaccessible mountain areas with low levels of income and service provision, bore the brunt of the earthquake's impact. About 600,000 houses were either completely destroyed or partially damaged. Virtually none of the housing in affected areas featured seismic considerations in their design. Compounding this was the generally poor quality of construction and maintenance.

Response to the Disaster: Relief, Recovery, Reconstruction Planning

The government, civil society and the international community responded swiftly and decisively to the disaster, providing relief and recovery support to the affected communities. Immediately following the disaster, the government established the **Federal Relief Commission**, Pakistan's first central disaster response agency, to coordinate relief activities across all actors and sectors. Moreover, the Pakistan military was mobilized with its extensive logistical and human resource capacity to assist the relief efforts. Civil society efforts complemented the support provided by government, and almost all major and local NGOs became active in the provision of relief, including shelter support. Within a month of the disaster, the government established the **Earthquake Reconstruction and Rehabilitation Authority (ERRA)**, responsible for planning and implementing reconstruction activities across the entire affected area in all sectors with the aim to 'build back better'. ERRA was established as an autonomous body, structured in a manner that allowed decentralized decision making, and with devolved presence in KP province as Provincial Earthquake Reconstruction and Rehabilitation (PERRA) and in AJK state as State Reconstruction and Rehabilitation Agency (SERRA).

The international community responded to the government's call for assistance through pledges of US$550 million to the United Nations' **Flash Appeal** for immediate relief. The government requested the World Bank and the Asian Development Bank to undertake a preliminary Damage and Needs Assessment (DNA) using globally accepted standards for the quantification of post-disaster damage and needs. The DNA estimated overall reconstruction would require approximately US$5.2 billion. Out of this, approximately US$1.4 billion was estimated to be the cost of rebuilding damaged and destroyed houses.

Six weeks after the quake, an international donor conference was held where representatives of various governments, financial institutions, and international development partners participated. They pledged different sums for reconstruction financing amounting to US$5.0 billion.

Planning for reconstruction and longer term recovery began soon after. Due to the onset of severe winter in most of the affected area, permanent reconstruction could not begin until next spring. The immediate challenge was to meet the basic shelter needs of the affected population over the harsh winter. Besides the early provision of tents for shelter support, the focus was shifted to winterised shelter solutions such as a 'one warm room' strategy supplementing materials salvaged from the debris of destroyed houses with ten CGI sheets. Additionally, a temporary shelter support grant of PKR 25,000 per affected household was disbursed across the affected area.

The Rural Housing Reconstruction Program

The DNA had identified private rural housing to have been the hardest hit sector. However, there was a dearth of experience and expertise in conceptualizing and designing a post-disaster housing reconstruction program of this scale and magnitude. There was immense pressure to mobilize and swing into action regardless of the limited means available at that time. The possibility of providing prefabricated housing solutions, or delivery of houses through large international contracting firms began to gain credence. But global experience in similar situations elsewhere had proved that these solutions achieve partial success at best. Prefabricated houses provide an alien environment that is hard to accept as a home, and contractor built units generally do not respond to the needs of individual household requirements. Such programs worldwide have thus had mixed results.

The Government of Pakistan therefore launched its flagship Rural Housing Reconstruction Program (RHRP) in April 2006, with technical and financial assistance (of US$210 million) from the World Bank. An owner-driven mechanism was devised which would provide multi-tranche assistance to the beneficiaries, based on assistance, inspection, and certification at various stages of construction. Initially, there was some hesitation on the part of the government about the program design, as it was under great pressure to show results quickly. The proponents of RHRP however convinced the government that reconstruction would be accelerated if individual owners of destroyed and damaged properties were made responsible for supervising their reconstruction.

The housing grants were meant to finance: (a) replacement of a destroyed house with a new seismic-resistant core unit of 250 sq.ft covered area, or (b) restoration and strengthening of a damaged house to seismically acceptable standards. The rebuilding was to be owner-driven - a mode well suited to the mainly rural affectees. Moreover, getting involved in rebuilding their own homes would help them get over their trauma and grief. A flexible and decentralized approach was necessary to respond quickly and in a sustainable manner to the needs of the moment. Households were able to utilize their own labour, hire trained craftsmen, and receive technical assistance from partner organizations to reconstruct or rehabilitate their houses to requisite standards. This approach proved to be a major factor in the eventual success of this initiative.

The eligibility criteria for these cash grants were: (i) all *Pucca* houses with structural damage beyond economic repair or structurally damaged *katcha* houses were eligible for a PKR 175,000 Reconstruction Grant; (ii) all *Pucca* houses with repairable structural damage were eligible for a PKR 80,000 Restoration and Strengthening Grant. Housing units with non-structural damage were not eligible for any compensation. A Detailed Damage Assessment and Eligibility Verification Survey was conducted to categorize housing units in the affected areas by the extent of damage and to develop beneficiary lists for each.

The grants were released in tranches, linked to stages of construction and adoption of seismically resistant standards. The Reconstruction Grant was disbursed in three tranches: (i) PKR 75,000 advance payment (including PKR 25,000 immediate shelter support already provided by the government); (ii) PKR 50,000 upon completion up to plinth level; and (iii) PKR 50,000 upon completion of walls. The Restoration and Strengthening Grant was disbursed in two tranches: (i) PKR 50,000 advance payment (including PKR 25,000 immediate shelter support already provided by the government); and (ii) PKR 30,000 upon completion of repairs. Disbursement of all tranches after the advance payment was subject to verification of progress and compliance with seismic-resistant standards. Disbursements were channelled through bank branches directly to beneficiary accounts.

Results Achieved by the Program

The RHRP is considered highly successful because it was able to achieve impressive results in both physical and financial progress. A total of PKR 86 billion were disbursed to beneficiary households for rural housing reconstruction and repair through the Program. Disbursements were made directly to beneficiary bank accounts. Due to the electronic disbursement mechanism so devised, not a single rupee out of the huge sums disbursed changed hands. All monetary transactions took place through banks, and thus every transaction had an audit trail ensuring transparency and accountability.

Disbursement was made in tranches based on stages of reconstruction. The second tranche to enable beneficiaries to mobilize materials to begin reconstruction was disbursed after the completion of a comprehensive damage assessment and beneficiary eligibility survey, and was successfully disbursed to **all beneficiaries**. Similarly, the fourth and final grant, disbursed after certification of seismic-resistant construction up to lintel level (all but roof and fixtures), was successfully disbursed to **91 percent of beneficiaries**.

The most significant achievement of the Program was the inculcation of a culture of seismic-resistant construction in the affected area. By end-2008, **99 percent** of reconstructed houses were compliant to seismic-resistant standards at plinth level, while **94 percent** were compliant at lintel level. Moreover, while expanding the housing units through their own resources, beneficiaries predominantly continued to voluntarily adhere to construction standards required by the Program.

By June 2010, of the 463,000 completely destroyed houses that were to be rebuilt, **93 percent** (429,000) had completed construction. Only 6 percent of the houses to be reconstructed remained unable to begin construction.

Table 1: Financial Assistance Disbursed by RHRP

Nature of Tranche	Amount of tranche (PKR)	Total disbursed (PKR billion)	Number of beneficiaries	% of eligible beneficiaries covered
First Tranche: Temporary Shelter Support	25,000	14	550,000	n/a
Second Tranche: Mobilization	75,000	40	567,000	101%
Third Tranche: Completion up to Plinth level	25,000	11	438,000	95%
Fourth Tranche: Completion up to Lintel level	50,000	21	420,000	91%
Total	**175,000**	**86**		

Note: The first tranche of PKR 25,000 for Temporary Shelter Support was provided to 550,000 beneficiary households before the official launch of the Rural Housing Reconstruction Program and the Detailed Damage Assessment and Beneficiary Eligibility Verification Survey. Thus, the universe of beneficiaries for this grant was different than that for the remaining grants, which were based on the Survey and part of the RHRP. Source: ERRA M&E Annual Report 2010-11

Table 2: Status of Housing Reconstruction as of June 2010

Status of Housing Reconstruction (of completely destroyed houses) as of June 2010		
	Number of houses	Percentage
Construction completed	429,000	93%
Under construction	7,000	2%
No work started to date	27,000	6%
Total	**463,000**	**100%**

Source: ERRA Annual Review 2009-10 - construction status as at June 2010.

Objective of this Manual

This Manual has been developed to assist project managers and policy makers engaged in large-scale post-disaster housing reconstruction programs make decisions on how to reconstruct housing and communities after major natural disasters. It provides a comprehensive guide to the tasks and processes required for development and management of post-disaster housing reconstruction programs, using key lessons and learning from reconstruction undertaken following the 2005 earthquake that struck northern Pakistan.


A gathering of beneficiaries discussing reconstruction issues and challenges.

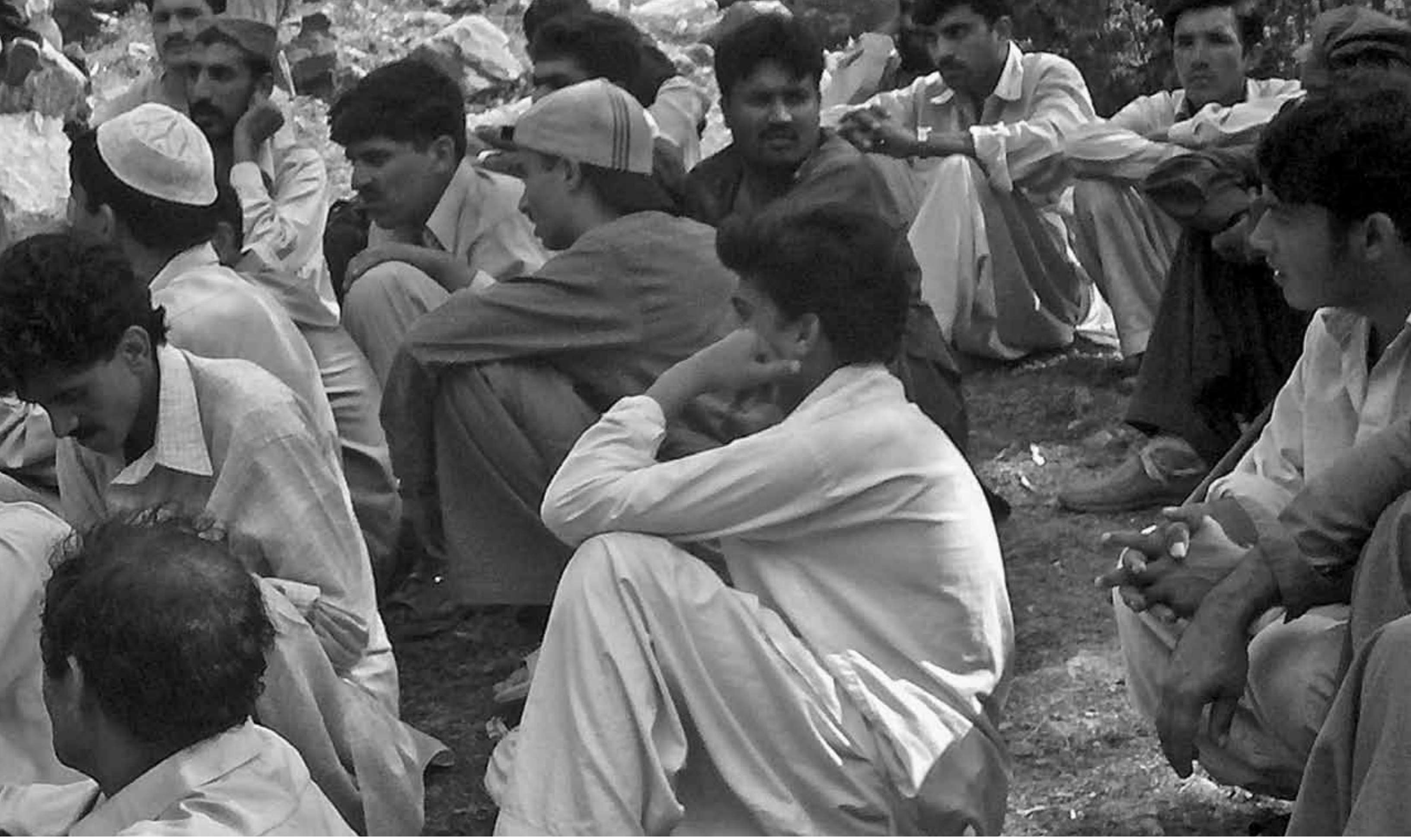
RHRP's experience shows that an institutionalized focus on results yields strong dividends even in post-disaster settings when urgency is required and baselines for relevant information often do not exist. The Manual thus also provides a strong **results-based outlook** on post-disaster Program management. It aims to guide policymakers in designing and implementing such a program with a focus on achieving results, especially program-level outcomes and objectives. It thus tries to make a unique contribution by bringing in a results lens to conventional post-disaster reconstruction efforts.

While the **Pakistan Rural Housing Reconstruction Program (RHRP)** began with a series of decisions that had to be made almost immediately, these decisions and the manner in which they were implemented are likely to have long-term impacts on the lives of those affected by the disaster. Those responsible for making these decisions had to do so with few precedents to guide them. Although considerable expertise was available, it was not always pertinent or relevant to the situation that confronted the project management team in 2005. This Manual provides information on the options that were considered in various aspects of reconstruction and insights into what worked and what did not.

In disasters, the absence of an easily accessible and applicable document often leads officials to **'re-invent the wheel'** when faced with such a task for the first (and perhaps only) time in their professional career. The sudden onset and enormous scale of the task they face, coupled with the obvious sense of urgency, leave many with little time to reflect. And feeling that they are facing a unique challenge deters them from looking for precedents.

Why Learn from Pakistan's Experience?

Pakistan's experience with the post-2005 earthquake reconstruction has been held up as a model of effective rebuilding, especially with regard to rural housing – an undertaking that was both large and complex. The response has been commendable given Pakistan's previous limited exposure to such events. The lessons to be learned from the experience are many and not limited to post-disaster response only. Many apply equally to national development efforts as well. An objective of this Toolkit is therefore to capture and make easily available the lessons from this unique and successful experience.



The RHRP is also important as a model of how well-conceived policy and strategic underpinnings along with requisite financing can be used **to incentivise active participation and leverage behaviour change,** as well as ensure efficiency, accountability, and compliance with standards.

Format of this Manual

This Manual is meant to be a guide for those tasked with responding to post-disaster housing reconstruction needs, and takes them through the various processes, tasks, and interventions involved in rural housing reconstruction. It uses the Pakistan experience of the post-earthquake Rural Housing Reconstruction Program as a case study, and presents methods and learning from that particular model.

Each chapter of the document covers a separate component of the Program. Within each chapter, a rationale is presented as to why this component is needed. This is followed by a results framework listing outcomes to be aimed for and possible indicators. Subsequently, detailed descriptions on how these results were achieved in the Pakistan context through the RHRP as a case study, how activities were managed, and what challenges were faced are presented. Finally, each section concludes with a list of lessons learned/policy recommendations, that policymakers should keep in mind for future such programs. The Toolkit provides a results-based perspective on post-disaster Housing Program management. It presents a results framework for each component of the RHRP that links desired impacts, program level and intermediate outcomes, and outputs.. A **consolidated results framework** for the entire RHRP is provided at the end.

It is, however, important to mention the obvious – that each reconstruction project is unique, and the relative importance and extent of each activity and sub-component may vary relative to the context. The Pakistan experience may not directly translate into similar results in a different context. Nonetheless, there are significant lessons to be shared for similar programs across the world.

The proud owners of a newly reconstructed seismic-resistant house.

Housing Reconstruction Program: Guiding Principles and Strategy

Why Needed?

As the immediate rescue, relief, and recovery operations are being conducted in a post-disaster setting, the planning of an institutionalized response and development of longer-term recovery and reconstruction plans must begin. This is because planning and initiation of reconstruction activities takes time and thus a headstart is desirable. Moreover, as soon as the affected communities have recovered from the initial shock, they want to get their lives back on track. Housing is an integral and often central component of this and, in the absence of a government policy or plan, disaster-affected people initiate actions that may later prove redundant, or obstacles to safe reconstruction.

Hence, as soon as the details of a disaster and its impact start emerging, the formulation of an outline reconstruction strategy needs to be initiated. The outline strategy needs to identify key decisions that have to be made regarding reconstruction: the implementing agency and institutional arrangements, eligibility criteria, and assistance entitlement. These may need to be fine tuned later, as the strategy development process unfolds after more details become available.

The Pakistan Context for Post-disaster Housing Reconstruction

The development of a post-disaster reconstruction strategy in Pakistan, especially in the rural housing sector, had to cater to a number of contextual challenges. The country had not previously experienced a disaster on the scale of the 2005 earthquake. Recent experience from Gujarat, India and elsewhere had shown promising results for housing reconstruction under an owner-driven model as compared to NGO- or agency/contractor-built housing. Experience from the response to the Indian Ocean tsunami of 2004 had demonstrated the risk of inequitable assistance packages and the consequences for housing, as well as the challenges of relocation of affected communities.

In Pakistan, prior to the 2005 disaster seismic provisions in the building codes were almost non-existent and rarely regulated. Moreover, their application on rural housing was not required. The majority of rural families had previous experience of managing construction of their own homes, generally by local skilled artisans. In many cases households had some knowledge of local construction materials and techniques. Historically, local construction techniques had had seismic provisions as well, since the area was a high seismic risk zone. However, since no major earthquakes had happened over a long time, people had either forgotten these good practices, or given them up in the interests of economy.

The earthquake affected area was vast, remote, mountainous, and extremely difficult to access, with highly scattered settlement patterns. The majority of affected home owners owned the land and intended to rebuild on the same sites. There was thus little scope for consolidation, multi-family development, or standardized housing. This proposition would not have been attractive to contractors, even had an agency/contractor-driven model been preferred. And neither was there an extensive pre-disaster NGO presence across the affected area to make an NGO-driven model feasible. **Owner-driven housing reconstruction** therefore seemed the best fit for the challenge at hand. Moreover, global experience with contractor or agency-led reconstruction had proved this strategy to be wanting.

Approach to Strategy Development

The DNA had included underpinnings of sectoral reconstruction policies and strategies, including those for housing. The World Bank-funded US$400 million Earthquake Emergency Recovery Project, which included a US$210 million housing reconstruction component, had further detailed and refined the policy and strategy for launching the RHRP. Once a dedicated post-disaster reconstruction agency had been set up in the form of ERRA, it was able to function as a central hub for all planning and reconstruction activities.

ERRA helped various stakeholders come together, and was able to carve out roles appropriate to their strengths, available skills, and areas of interest. These included government agencies, the military, development partners, national and international NGOs, private sector, and philanthropists. To ensure coherence and avoid duplication, a Housing Strategic Working Group (HSWG) was later established as a discussion forum, especially for detailing the cascaded training program. By doing so, ERRA ensured strong commitment to common principles from among a very diverse range of partners. The HSWG was split into thematic working groups concerned with: (a) technical guidelines; (b) assessment; (c) training curricula; and (d) information campaigns.

Program Vision

The Rural Housing Reconstruction Program was guided by the overarching principle of 'build back better' through an owner-driven, assisted, and inspected reconstruction regime supported through community mobilisation and training. Seismic-resistant housing reconstruction and rehabilitation, and inculcation of a culture of voluntary seismic compliance in the earthquake affected districts of KP and AJK were the envisaged outcomes.

Program Policy Principles and Strategies

The Guiding Principles and accompanying strategies underpinning the Program and its implementation are summarized in Table 3. It provides a comprehensive snapshot of the various elements involved in the successful operationalization of the Program, and their inter-linkages with each other to form a cohesive whole.

It is important to mention here that while multi-hazard risk mapping greatly enhances the effectiveness of post-disaster reconstruction, by promoting disaster risk reduction, it was not a part of the overall RHRP per se. The massive scale of the disaster and absence of requisite capacity to undertake such an exercise would have meant – had this been undertaken - a substantial delay in commencing implementation of RHRP, awaiting results of the hazard risk mapping. As an alternative, the form for the Detailed Damage Assessment Survey included questions noting visible hazard risks like proximity to a fault line, land sliding, etc. These identified the need for relocation of houses on hazardous sites, for which the Landless Policy was subsequently announced. An important lesson from this experience is that, time permitting, a multi-hazard risk mapping exercise in concert with a major reconstruction program can add great value, and fundamentally contribute to the disaster risk reduction agenda on a national level by identifying concrete steps for prevention and mitigation.

Tranche-based Reconstruction/ Repair Grants

As a policy principle, grants for housing reconstruction were to be provided in tranches linked to stages of construction and meeting seismic-resistant construction criteria, duly inspected and certified by Assistance and Inspection (AI) teams.

Determining the size of a grant

The size of the grant was determined after an extensive analysis of the prevailing market costs in building a core housing unit, of a uniform number of rooms and size, to appropriate seismic-resistant standards, with locally available materials. This involved collection of data on prices of various building materials across the affected area, and prevailing rates for labour and transportation. It was assumed that there would be significant (up to 40 percent) reuse of salvaged building materials such as timber, stone, blocks and bricks from the debris of the damaged/destroyed houses, which would increase the value-for-money of the Program grant. Moreover, beneficiaries were also expected to reuse the corrugated

Table 3: Guiding Principles and Strategies of RHRP

The Program Objectives were to: (a) Provide financial and technical assistance to disaster-affected homeowners in reconstruction or rehabilitation of their destroyed or damaged houses to seismic-resistant standards, using an owner-driven, assisted and inspected construction regime; and (b) Inculcate a culture of voluntary seismic compliance by inducing a behavioural change.

Policy Principle	Strategy
1. Ensuring owner-driven housing reconstruction - *homeowners in charge of rebuilding their own homes*	Providing an enabling environment to homeowners, through: ■ Prior training, information, education, and communication campaigns; ■ Rebuilding with familiar methods & easily accessible materials – *ensuring sustainability and cultural preferences in design;* ■ Providing technical assistance during construction; ■ Promoting the use of salvaged material, own labour and/or additional resources such as hired trained craftsmen, etc.; ■ Ensuring building materials supply chain; ■ Facilitating the opening of homeowner bank accounts.
2. Assisted and Inspected reconstruction & restoration regime	Mobilizing a large number of assistance and inspection (AI) teams, for house-to-house outreach Disbursing grants in tranches, linked to stages of construction and adoption of acceptable seismic-resistant standards Tranche disbursement through banks after progress and quality validation and certification Resources for AI teams and their management structures procured through partnership arrangements
3. Ensuring seismic safety	Development of structural design options, construction guidelines, and training curricula that meet internationally accepted standards for low-cost seismic-resistant housing such as: ■ Having thinner walls ■ Having lighter roofing ■ Having well-connected structural systems ■ Excluding the use of *katcha* (semi-permanent) type construction Establishment of a review and approval mechanism for additional structural design options submitted by various stakeholders, based on reference to minimum structural design standards Seismic zoning and multi-hazard risk mapping on-going to guide planning and construction
4. Ensuring uniform principles and assistance packages *across all funding sources* & maximizing outreach *- through optimized designs and implementation mechanisms*	Coordination of multiple reconstruction initiatives & standards for equity. ERRA to ensure: ■ application of uniform policies across the board ■ application of consistent structural design standards ■ full spatial coverage ■ reduced risks of beneficiary double counting or being missed ■ Cash grants to target core housing – which may not be necessarily 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 destroyed houses with new seismic resistant core units Restoration and strengthening of damaged houses to seismically acceptable standards Rebuilding In-situ minimizing relocation costs Relocating only where necessary – i.e. where hazard risks remain very high due to: ■ Seismicity ■ Topography ■ Soil conditions ■ Other environmental factors Enhanced sustainability of Program ensured through parallel efforts on rehabilitation of livelihoods, physical and social infrastructure - linking housing to livelihoods and infrastructure rehabilitation, etc.

Table 3: Guiding Principles and Strategies of RHRP (cont.)

Policy Principle	Strategy
5. Ensuring judicious use of grants; reducing and managing conflicts and grievances; avoiding socio-economic distortions, inequities and disparities	Damage assessment criteria consistent across all affected areas (resurvey may be done for specific trouble areas) Eligibility criteria to include land ownership criteria, or in case of tenants, agreements/authorization from owners to rebuild the house MoUs to be signed with beneficiaries to ensure the judicious and best possible use of the grants, with penalizing clauses for those found in intentional non-compliance Developing and putting in place participatory and inclusive information management and grievance redressal mechanisms

iron sheets provided to each affected household along with the temporary shelter support (TSS) grants. Since the Program was owner-driven, contractors' profit margins were not included in the costing of housing reconstruction.

The need for tranches – putting disaster risk reduction at the forefront

In order to ensure that housing reconstruction was of the requisite seismic-resistant standards, the Program disbursed the housing grants in tranches, based on certification of construction quality, as opposed to a one-time disbursement of the entire amount at the beginning.

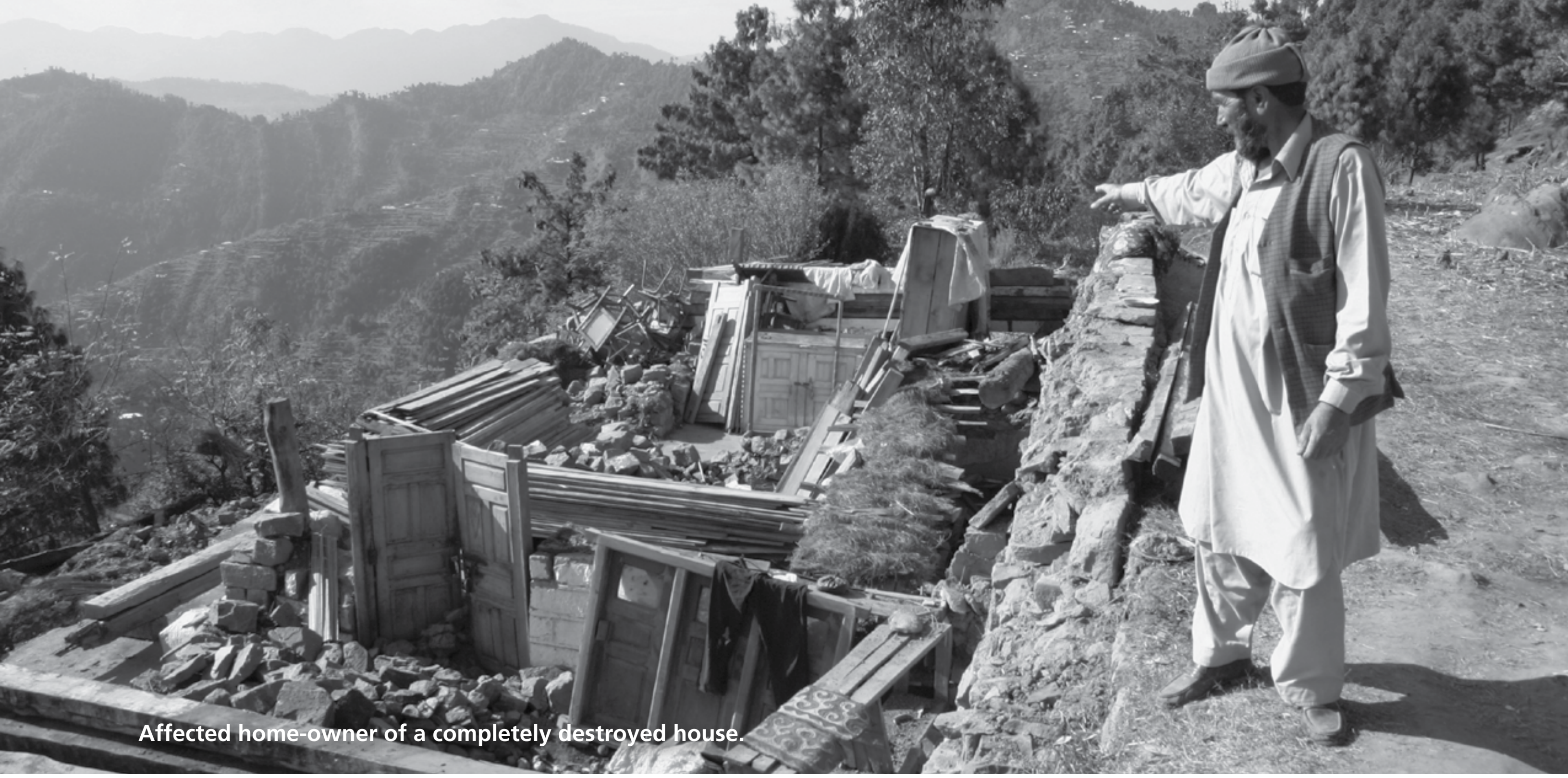
There were three tranches, in addition to the TSS grant, disbursed in 3 stages: a) at damage assessment and establishment of eligibility, as an advance to mobilize and reconstruct up to plinth level); b) after certification of foundations and the plinth, for construction up to lintel level; c) upon certification of the walls and structure to lintel level, for the roof, finishes, and completion of the house. These stages were set based on structural design considerations, as these provided key points for inspection and remedial measures in case of non-compliance.

A summary of the criteria and financial assistance amounts is provided below:

Table 4: Summary Criteria for Financial Assistance

Extent of Damage	Fully Destroyed House	Partially Damaged House
Definition	Core units of *Pucca* & semi-*Pucca* houses that need to be reconstructed – including both totally destroyed houses, or partially destroyed houses with structural damage that is beyond economic repair (as determined through the detailed damage assessment). Core units of *Katcha* houses that have either been destroyed or have suffered visible structural damage (not subjected to detailed damage assessment).	Core units of *Pucca* & semi-*Pucca* houses with structural damage within economic repair.
Grant Entitlement	Reconstruction grant for a total of PKR 175,000 (US$2,931[1])	Restoration and strengthening grant for a total of PKR 100,000 (US$1,675)
Disbursement Schedule	Reconstruction grant to be disbursed in 4 tranches, as follows: ■ PKR 25,000 (US$419) temporary shelter support ■ PKR 75,000 (US$1,256) mobilization grant released to affected households meeting eligibility criteria ■ PKR 25,000 (US$419) upon completion of house to plinth level ■ PKR 50,000 (US$838) upon completion of house walls and roof (lintel level)	Restoration grant in 2 tranches, as follows: PKR 25,000 (US$419) temporary shelter support PKR 75,000 (US$1,256) grant released to affected households meeting eligibility criteria

[1] The PKR-US$ currency conversion rate of PKR 59.7 = US$1 (per the Technical Annex Document for Earthquake Emergency Recovery Credit, dated December 5, 2005) has been used for currency conversions in Table 4. During project implementation, the PKR-US$ conversion rate changed and was PKR 86.03=US$1 at Project Closing (May 31, 2011) making the Reconstruction Grant for fully destroyed houses (PKR 175,000) to be equivalent to US$2,034.


Affected home-owner of a completely destroyed house.

Reducing variation in purchasing power of grant

Since the Program beneficiaries were dispersed over remote areas, there was a significant risk that costs of building materials would vary considerably, thus reducing the purchasing power of the grant for remotely located households. To counter this, and to ensure stable and predictable availability of necessary building materials, a building materials supply chain was established with the assistance of the private sector throughout the affected area. Moreover, building materials hubs were set up throughout the Program area, reducing the price variability and risk of non-availability of essential building materials. More details on building materials supply chain are provided in the relevant chapter.

Supporting the vulnerable: tenants, landless, and the poor

The Program also ensured various kinds of vulnerabilities did not adversely influence the affected population's access to safe and adequate shelter. Female-headed and elderly-headed households were given special focus by the Program implementing agency, with expedited processing of paperwork and technical assistance in safe housing reconstruction. (For more details, see separate chapter on Social Aspects.)

Parallel to the Housing Program, the government with the assistance of the World Bank, ran a separate program for social protection, providing livelihood cash transfers to the most vulnerable affected population to support expenses during the recovery period. This program focused especially on poor and vulnerable households, and provided them with an additional source of funds for their immediate needs.

Supporting the principle of equity, the RHRP ensured that tenants also received financial assistance and could participate fully in the Program, even though it was described as an 'owner-driven' one. This was conditional upon the tenants obtaining a no-objection certificate (NOC) from the property owners to reconstruct houses on those locations. In most cases, the owners in return agreed to let the tenants continue to occupy those properties for a mutually agreed period of time without charging any rent. The Program was thus able to benefit both tenants and owners through this arrangement.

The Program also covered the issue of safe land for reconstruction. The precondition of having a safe site to reconstruct a house became a barrier to some families who had lost both their house and land due to landslides triggered by the earthquake, or whose land was deemed too hazardous for reconstruction. They were assisted through a separate Landless Program that provided financial assistance to buy land at a safe site. This Program was managed by ERRA in close coordination with the RHRP. (For more details, see separate chapter on Social Aspects.)

The rugged Himalayan terrain of the affected area posed significant challenges of access and outreach.

Chapter 2
Institutional Arrangements

Why Needed?

A key consequence of major disasters is that they disrupt normal working and effectiveness, particularly of government and administration. The more severe and widespread the disaster, the greater is the disruption, and the more urgent the need to have in place an effective system for reconstruction planning and management.

Moreover, planning and management of the reconstruction effort is likely to require additional tasks to be undertaken in ways that are not necessarily the same as the normal processes of government and public administration. Hence, purely relying on normal government structures and institutions to take these on is generally not the most effective option. For greater efficiency and effectiveness it is preferable that these tasks are circumscribed, and performed by an organisation specifically established and designed to undertake them.

Suggested Results Framework

Component: Institutional Arrangements	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Establishing and capacitating dedicated reconstruction agencies, responsible for undertaking post-disaster reconstruction programs from strategy development to implementation	Enabling legislation passed to create institutional mechanisms for implementing post-disaster reconstruction programs Dedicated agency established and capacitated for implementing and managing post-disaster reconstruction program Linkages developed and formalized with national and international partners to support reconstruction program
Institutional development for longer term disaster risk reduction on national level	Institutional support provided for national level long term disaster risk reduction

Achieving Program Results – The Pakistan Experience

The most important institutional requirement for successful reconstruction is to have a responsive institutional mechanism with requisite authority in place as quickly as possible, with a clearly laid down mandate and the necessary resources. Equally important is to have clearly articulated and understood boundaries and complementarities between the disaster reconstruction agency and the regular mainstream government agencies. In the case of Pakistan, given the federal structure of the country, the institutional setup also had to take into account federal and provincial needs and have clear articulation of responsibilities between the different levels. The Pakistan RHRP greatly benefited from early and strong political commitment to establish requisite institutional arrangements for emergency response and reconstruction.

The Pakistan Context

International

The disaster occurred shortly after the adoption of the **Hyogo Framework for Action 2005-2015** at the World Conference on Disaster Reduction. The recommendations in the Framework were based on global best practices and lessons learned from decades of experience, and constituted agreed priorities for action. The first priority was institutional strengthening to ensure that disaster risk reduction is on the national agenda. Among the key activities within this priority was the creation of national institutional and legislative frameworks.

National

Pakistan did not have a dedicated disaster management agency of any kind for disaster response and recovery planning at the time of the 2005 earthquake, as the country had not experienced a disaster of such a scale in recent years. The magnitude of the earthquake required that an appropriate structure be quickly established to ensure coherence of government response.

Federal, provincial and state

The earthquake affected areas included districts in KP province and AJK state. AJK is a self-governing state under Pakistani control with its own elected president, prime minister, legislature and high court. The seat of the state government of AJK is Muzaffarabad which was close to the epicentre of the earthquake and suffered extensive damage. KP has distinct subdivisions, notably Pashtu speaking areas in the west and Hindko speaking areas in the east (Hazara division). The seat of the provincial government is based in Pashtu speaking Peshawar, which was unaffected by the earthquake.

Construction and housing sectors

In 2005, Pakistan did not have specific seismic provisions in its building code. Moreover, rural housing was not subject to enforcement of any building or planning codes. Neither was there any institutional mandate or capacity for rural settlement planning or building control.

Creation, strengthening and capacity building of dedicated reconstruction agencies

Immediately after the earthquake, a Federal Relief Commission (FRC) was created which was the first dedicated agency for disaster response in Pakistan. Within a month of the disaster, the **Earthquake Reconstruction and Rehabilitation Agency (ERRA)** was set up with a clear mandate to manage post-disaster recovery and reconstruction across 12 sectors. Housing, one of the 12 sectors, was divided into Rural and Urban Housing. The FRC was later merged into ERRA, providing a clear exit strategy for the former.

ERRA's responsibilities included the development of sectoral reconstruction and recovery programs and cross-sectoral support including media, M&E, finance, and knowledge management. The agency coordinated all assistance through a 'one-window' mechanism. All stakeholders of the RHRP were obliged to work through it. In view of the federal nature of the country, the Provincial and State Reconstruction and Rehabilitation Agencies (PERRA and SERRA) were set up in KP and AJK respectively as dedicated bodies for reconstruction in those areas. This was important for the RHRP as there was no provincial or State line department responsible for private housing, especially in rural areas.

The following table lists key responsibilities of the various tiers of government, including ERRA, in reconstruction management. Due to the federal nature of the country, various levels of autonomy were clearly provided. ERRA Council, the supreme body for post-earthquake reconstruction-related policymaking, was headed by the Prime Minister.

Table 5: Responsibilities of Different Institutions Involved in Post-Earthquake Reconstruction

Institution	Responsibilities
ERRA Council + ERRA Board	■ Major policy decisions ■ Annual Work Plan approvals
ERRA	■ Overall coordination ■ Policy formulation ■ Approval and project management of national-level projects ■ Program monitoring and standard setting ■ Financial management of funding ■ Donor coordination ■ Reporting to ERRA Council and Board
Provincial/State Steering Committee (with respective line departments and ERRA represented)	■ Approval of annual reconstruction plans ■ Reporting to ERRA ■ Oversight of Reconstruction Agency ■ Approval of large projects (above certain threshold)
Provincial/State Earthquake Reconstruction and Rehabilitation Agencies	■ Autonomous body ■ Reporting to Steering Committee and ERRA ■ Preparing Annual Work Plans ■ Implementing large contracts in coordination with line agencies ■ Monitoring regional programs
District Reconstruction Units (DRUs)	■ Preparing district reconstruction plans ■ Implementing small contracts in coordination with District Governments/District level line agencies ■ Reporting to PERRA/SERRA ■ Coordinating/Partnering with Partner Organizations (POs).

Linkages with existing national-level institutions and partners

The scale of the RHRP required ERRA to establish partnerships with government and semi-government agencies to enhance its technical and implementation capacity. This was ensured through high level umbrella agreements. The Assistance and Inspection regime, as well as training and capacity building, was outsourced to Partner Organizations (POs) on the basis of their existing presence and outreach at Union Council-level (the lowest rung of administration) in the affected areas. The two largest POs were the Pakistan Military and the Pakistan Poverty Alleviation Fund (PPAF).

The Pakistan Army helped undertake the Detailed Damage Assessment and Beneficiary Eligibility Verification Survey across the affected area in record time, due to their existing outreach and logistical capacity. PPAF took on full implementation of the RHRP in 34 Union Councils (UCs) where it already had an active presence. Other partner organizations assisted in delivering the cascaded program for training of craftsmen in seismic-resistant construction methods and details, as well as educating beneficiaries and affected communities on them. These POs, along with the Pakistan Military, also performed assistance and inspection duties, the latter for certifying status of completion and compliance to seismic-resistant standards to enable release of the subsequent grant tranche. Finally, POs were also responsible for community mobilization and the creation of Village Reconstruction Committees, for community participation in reconstruction, as well as bulk procurement of materials and optimal use of labour.

An AI team member explaining program requirements to affectees.

Crucial support for database management and beneficiary verification was provided by the National Database and Registration Authority (NADRA), which had a pre-existing database of all individuals in the country who had been issued with National Identity Cards (NICs). NADRA played an important role in various components of the program, especially those involving compilation and analysis of data, including: beneficiary eligibility verification; grant payment verification; and reporting, monitoring, and evaluation of Program results.

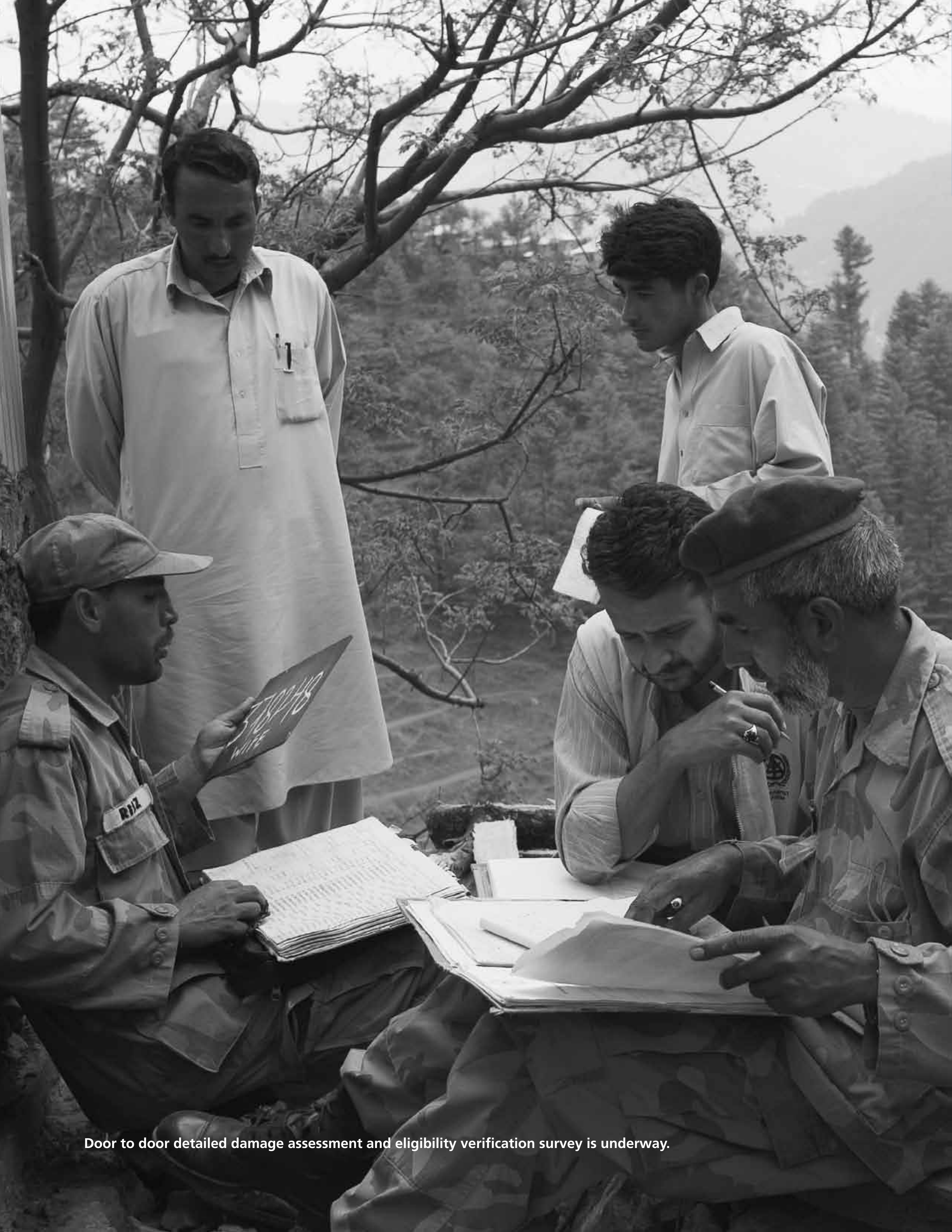
National institutions for longer-term disaster risk reduction

Globally, there is a critical need for countries prone to recurrent disasters to strengthen their response capacity as well as reduce their hazard vulnerability to mitigate future losses. A key aspect of this capacity building is institutional development. In Pakistan, the reconstruction experience soon led the government to develop the National Disaster Management Framework (NDMF), and establish the National Disaster Management Authority (NDMA) as well as the Provincial Disaster Management Authorities (PDMAs) in all provinces across the country.

NDMA has emerged as the key coordinator in subsequent post-disaster situations, which Pakistan has faced a series of since 2005, particularly in the immediate relief and recovery phases. Moreover, NDMA is also working with international partners to conduct a comprehensive multi-hazard risk mapping of the country, which will holistically inform policy making for disaster risk management and disaster mitigation. This is a long overdue step that will support and enhance the DRR agenda in Pakistan.

Lessons Learned – Considerations for Future Programs

Lessons Learned	Comment
Political support critical at the start, drops over time	ERRA, as well as the reconstruction programs it undertook, enjoyed great political support at the outset. However, subsequent major events in Pakistan such as conflict, recurrent floods, and economic and political upheavals diluted the attention of the political leadership and the media, and funding avenues also declined. Governments should take an early and active role in the response, showing political commitment. The absence of government leadership is one of the greatest risks in responses, at times bigger than resource deficiencies.
Partner Organisations provide complementarities, but also some risks	The RHRP greatly benefited from the capacity of various partner organisations for implementation. However, this also posed risks when partners themselves faced constraints. The Program design envisaged a more extensive role for NGOs, which did not materialize due to their capacity constraints, leading to reallocation of responsibilities.
Inter-sectoral synergies need focussed attention to be optimally used	Reconstruction activities within 12 sectors were the responsibility of respective units within the newly-created ERRA. This led to the creation of 'silos' looking at individual sectors with often weak synergy across them. Lessons learned from one sector were thus not automatically transmitted across all sector Programs.
Early decisions on clarity of institutional responsibility critical	Early clarity on institutional roles and responsibilities greatly helped engagement with various stakeholders, and accelerated decision making. This avoided the risk of institutional gaps leading to confusion, delays, loss of confidence and resources. It also helped capitalize on early funding.



Door to door detailed damage assessment and eligibility verification survey is underway.

Chapter 3

Detailed Damage Assessment & Beneficiary Eligibility Verification Survey

Why Needed?

It is critical for a post-disaster housing reconstruction program that the potential beneficiaries are carefully identified, and their eligibility confirmed against transparent and uniform criteria. A Detailed Damage Assessment and Beneficiary Eligibility Verification Survey is required to ascertain the scope and extent of damage to the housing stock against uniformly applied engineering criteria, and to validate the authenticity of beneficiaries. Such a survey is also extremely useful in identifying frequent causes of building damage, which will become inputs into disaster-resistant reconstruction and rehabilitation standards and structural design solutions. Moreover, such a survey also helps identify buildings that though damaged, are safe for occupation versus those that are not and could be a risk to life and assets unless repaired or demolished and reconstructed.

Suggested Results Framework

A Results-based approach can be used to manage and monitor the damage assessment and beneficiary eligibility verification exercise. A suggested Results Framework for this purpose is presented below.

Component: Damage Assessment and Beneficiary Eligibility Verification Survey	
Intermediate Outcome	**Intermediate Outcome Indicator**
Rapid post-disaster preliminary damage and needs assessment to develop a baseline for reconstruction programs	Preliminary damage assessment by local administration completed immediately after disaster Preliminary baseline of disaster-affected households and communities created
Formation, training, and mobilization of survey teams across affected areas to conduct damage assessment and beneficiary eligibility verification survey	Survey form developed and tested MoU developed- to be signed between beneficiary and survey team % of affected area (in administrative units) where survey teams have visited within ‘x’ months after launch of survey % of households visited considered eligible for reconstruction/repair grants % of households considered eligible for reconstruction/repair grants with which agreement/MoU signed outlining responsibilities of beneficiary and the government
Setting up of central database of eligible beneficiaries along with unique identification numbers	Setting up of centrally-managed eligible beneficiary database, linked to the national identity database Key beneficiary information input, based on survey data
Transition of survey teams to Assistance and Inspection (AI) teams for continuing Program implementation	Training regime on assistance and inspection (AI) of seismic-resistant construction developed to retrain survey teams into AI teams AI teams mobilized in all affected areas after disbursement of mobilization grant and commencement of reconstruction activity

Achieving Program Results – The Pakistan Experience

In the case of Pakistan, a **comprehensive door-to-door Detailed Damage Assessment and Beneficiary Verification Survey** was launched in spring 2006, soon after the harsh winter that had rendered many of the affected areas inaccessible, was over. It was to serve the dual function of assessing damage to houses in the affected area, and establishing a comprehensive list of verified beneficiaries (households) that would be eligible for the housing grants. The survey took approximately four months and resulted in the creation of a database of beneficiary households, with corresponding levels of damage to their respective dwellings, as well as information on the most frequent causes of building failure in the earthquake-affected area. This survey was the starting point of the entire RHRP, and was used as a basis on which the rest of the Program was implemented.

Conducting the survey was a difficult exercise due to the harshness of the terrain and the vastness of the affected area, requiring high logistic capabilities. Approximately 600 teams needed to be mobilized across the affected area. Capacities available in the market were found to be inadequate to undertake the survey immediately. After attempting to hire large engineering firms without success, ERRA turned to the Pakistan military for assistance. Their planning and logistic capacity and existing outreach to the most remote areas made it possible for them to undertake the survey in an accelerated manner. Over 600 teams consisting of three members each conducted the assessment. Each team was led by a military engineer, and comprised a representative of the local community and a government functionary such as a revenue official or a teacher.

The survey was conducted in a **participatory manner** with full community involvement, ensured by the community representative on the survey teams. The government representative on each team helped in owner verification through revenue records in cases of absence/loss of documents. Concurrently, the survey teams signed Memoranda of Understanding **(MoUs)** with verified heads of beneficiary households. The MoUs outlined the compliance and certification requirements of the tranche-based program of reconstruction and repair grants, and the division of responsibilities between the government/ERRA and the beneficiaries.

This section uses the Results Framework provided above to elaborate on how the suggested results were achieved in the Pakistan post-earthquake context. There is special emphasis on the processes and steps used to manage the process of seismic-resistant design solutions.

Preliminary damage survey immediately post-disaster for baseline of future program

Immediately after the disaster, the local-level administration and provincial governments conducted a rapid preliminary damage survey to assess damage and gain a picture of support needs of affected households. The survey covered those living in camps as well as at places of origin. The results from this preliminary survey led to the creation of a baseline that was then used for the comprehensive survey at a later stage. It thus provided an important tool for the Program implementation team to organize their field level activities for the conduct of the comprehensive survey. It also provided primary data that, once validated, became the basis of the DNA, and in turn the commitments made at the Donors Conference.

This rapid survey was also used to determine the households that qualified for a Temporary Shelter Support (TSS) grant of PKR 25,000 provided by the government. This grant was disbursed within a few months of the disaster, prior to the launch of RHRP, and was used by households for both shelter and livelihood support needs. Once the Program was launched, this grant was considered to be the first of the four tranches provided through the Program. The mobilization grant of PKR 75,000 after the conduct of the comprehensive damage assessment and beneficiary eligibility survey was thus named the 'second' grant.

Formation, training, and mobilization of survey teams for detailed damage assessment and beneficiary eligibility verification survey

The survey form and technical guidelines for the Detailed Damage Assessment and Beneficiary Eligibility Verification Survey were developed under the Rural

Housing Reconstruction Program. While the Pakistan Military undertook the survey in most of the affected area, the Pakistan Poverty Alleviation Fund (PPAF) agreed to take up 34 union councils in which they already had a strong field presence through their partner organisations (POs). Over 600 teams were formed, trained on the appropriate and consistent application of technical damage criteria, and mobilised.

These teams conducted comprehensive door-to-door visits in all administrative units of the earthquake-affected area over a four-month period to assess and categorize damage, determine eligibility, and sign MoUs. In essence, three separate activities were combined into one exercise to enhance efficiency:

- comprehensive damage assessment, to determine nature of damage to each surveyed dwelling;
- beneficiary eligibility verification;
- signing of MOUs (quasi-legal agreement) with the verified beneficiaries.

Rationale for Involvement of the Military

The Pakistan Military was uniquely placed to play an important role in this survey due to its pre-disaster presence and outreach across the affected area, its organizational and human resource capacity, as well as its strong reputation and credibility among the affected communities. These strengths became great advantages for the Program to have involved the Army as an important Partner Organization for the conduct of the survey, and subsequently for the Assistance and Inspection regime, seismic-resistant construction training regime, and data collection and management.

In view of concerns of development partners on funding financial remuneration of the military for Program implementation, the Army itself paid the salaries of military personnel involved in the Program, while project-related incremental costs were borne by the Program implementing agency. In total, the Pakistan Army provided manpower for survey teams in 268

An affectee displaying beneficiary identification number in front of his damaged house.

affected Union Councils out of a total of approximately 300, thus contributing significantly to the RHRP.

Capacity building and training of survey teams

The '**Cascaded Training**' module, (refer to relevant chapter) to create a critical mass of artisans and masons trained in seismic-resistant construction standards, was well integrated with this component. The survey teams were given adequate training in technical capacity. Program partners trained a core team of master trainers who in turn provided training to the survey teams in the field. This ensured that the assessment criteria remained uniform across the area. All teams were also issued an instruction manual to guide them in damage assessment and data recording.

Composition of survey teams

The door-to-door survey teams comprised 3-5 members including:

1. Federal government technical representative – Army personnel or PPAF
2. Province or State representative – Local school teachers
3. District representative – *Patwari* (revenue officials)
4. Community representative – local Union Council elected official
5. Village representative – community notable or facilitator

The teams were fully empowered to assess the damage category of the house (repair or reconstruction) against the laid down technical criteria, and sign an MoU with the verified house owner or an authorized person. **Community representation** in the damage assessment and beneficiary eligibility verification exercise was crucial, facilitating:

- Verification of beneficiary eligibility (in the absence of documentation) through community validation;
- On-the-spot and subsequent resolution of inter-household grant entitlement issues (implementing the one grant per roof principle);
- Resolution of owner-tenant issues.

Creation of central database for beneficiary eligibility and grant payments following field survey

As the survey was being conducted, information from all MoUs was collected at the field level, collated at formation level, and then sent to Program headquarters at the central level as well as to the National Database and Registration Authority (NADRA), the Program information management partner. Here, this information was converted into a centrally monitored and administered grant/beneficiary database, linked to the National Identity Card (NIC) database. NADRA has the mandate for this database and therefore had the requisite capacity for such tasks. As the Program progressed, this database became a crucial link for Program implementation.

Transition of survey teams to assistance and inspection (AI) teams for continuing program implementation

Since the survey teams became well versed in technical matters related to the Program, once the comprehensive door-to-door survey was concluded, they were transformed into the **Assistance and Inspection (AI) teams,** underpinning the AI regime. These provided on-site assistance and advice to homeowners during various stages of construction, and also certified adherence to seismic-resistant standards at requisite stages of construction to enable subsequent grant tranches to be released. They conducted field visits on a continuous basis throughout Program implementation to deliver on their mandate. They were provided with further training by Program partners in technical inspection as well as assistance methods. Through the 'cascade training' approach, these teams helped train master craftsmen, masons, construction workers and homeowners at the field level on seismic-resistant construction techniques.

Schematic description of the survey

The following diagram provides a layered picture of the flow of the comprehensive door-to-door survey process:

Figure 1: Damage Assessment and Beneficiary Eligibility Verification Survey Process

Preliminary Damage Assessment Survey and Baseline

Rapid preliminary damage survey immediately post-disaster by local administration. Development of Baseline for comprehensive survey using list of affected households provided Temporary Shelter Support grant of PKR 25,000 (to affectees living in relief camps and places of origin).

Damage Assessment Guidelines

Survey Form and Guidelines for detailed Damage Assessment and Beneficiary Eligibility Verification Survey developed

Formation and Training of Survey Teams

Over 600 teams from Pakistan Military and PPAF trained on use of form and application of technical criteria for damage assessment, dissemination of program information, as well as social mobilization.

Survey Teams Mobilized in Affected Area

Comprehensive door-to-door visits by survey teams over four-month period to assess and categorize damage, determine/verify eligibility, and sign MoUs. Community involvement in damage assessment and beneficiary eligibility determination.

Creation of Grant + Beneficiary Database

Information from all MoUs converted into grant/beneficiary database centrally monitored and administered by national-level ID registration authority.

Post-Survey Follow-up

Transition of survey teams into Assistance and Inspection (AI) teams to conduct regular visits to construction sites for assistance, inspection, and certification throughout Program duration.

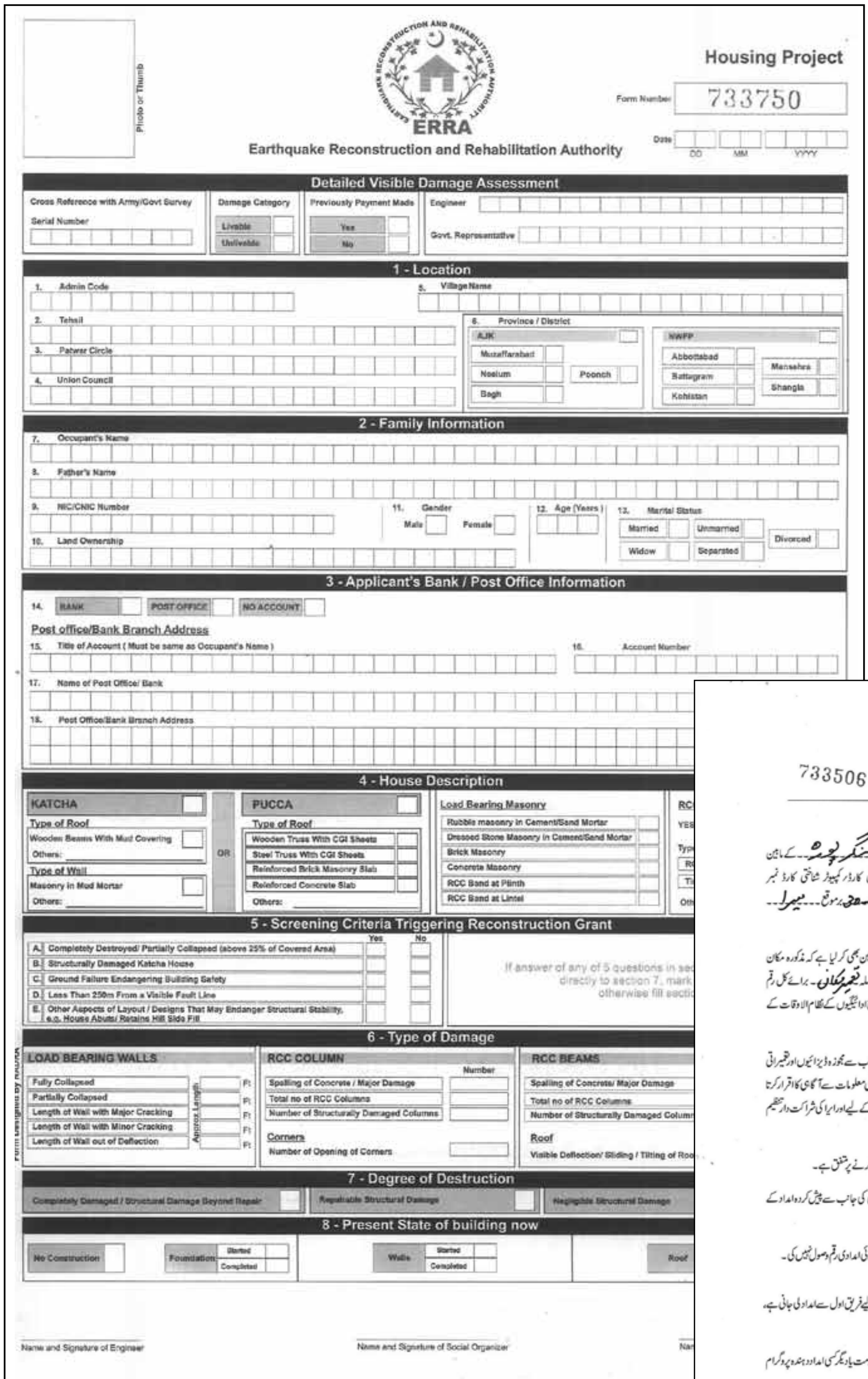
Risks and Challenges

Since the Detailed Damage Assessment and Beneficiary Eligibility Verification Survey was the first component of the Program that required field implementation, there were significant risks that had to be accounted for. This was done through certain mitigation tools built into the design and implementation of this component. These are explained below:

Risk / Challenge	Mitigation tool
Scale and Speed: Program could not commence until the Survey was completed to confirm caseload and establish database of beneficiaries.	Large workforce mobilized having previous knowledge of the area, existing outreach, and strong logistical capacity.
Consistency: With 600+ teams assessing a range of buildings, consistency in damage criteria and decisions was critical to ensure fairness.	■ Number of categories of damage simplified; ■ Limited number of partners involved; ■ Training of teams on damage criteria ensured; ■ Strong oversight and quality assured.
Fraud: Risk that individual beneficiaries will benefit from more than one grant.	■ Teams comprised members who knew community well; ■ Unique national ID number and photograph of each MoU holder beneficiary with his/her property on survey form to avoid duplication.
Disputes and Discontent	■ Inclusive process for damage assessment, supported by strong Public Information Campaigns; ■ Basic training in negotiation and social mobilization skills to assessment teams.
Grievance Redressal	■ Resolution of grievances at field level as much as possible; ■ Official cut-off date announcement and closure of damage assessment exercise; ■ Establishment of complaints desk.
Exclusion of deserving beneficiaries	■ Confirmation from community representatives on comprehensiveness of survey in each area; ■ On-going policy level dialogue on legal process involving land, property, and other issues; ■ Complementary policy for the Landless.

Lessons Learned – Considerations for Future Programs

Assessment should be clear and conclusive	Comprehensive damage assessment should take place once, with clear criteria for categorization of damage, and a formal closure date to allow next stage of activities to proceed. Moreover, damage assessment and eligibility verification should be carried out as a single exercise if possible, which accelerates the process and mitigates risk of error.
Status and legal issues should be prioritized upfront	Issues of land, property, or tenure status which affect beneficiary eligibility need to be identified early and corresponding policy decisions taken.
Community can play active role	Affected communities can play key roles such as in verification, negotiation, mobilization, and confirmation of completion. Moreover, participation in assessment provides on-job technical awareness regarding seismic vulnerability and safe construction practices.
Use photographs	Photographs of damaged buildings with beneficiaries assist in monitoring, reduce risks of duplication, and yield important technical data for developing engineering solutions.
Resolve Grievances at field level	Assessment teams should be mandated to resolve disputes, unrest, and grievance at field level. This may require degrees of flexibility to make informed decisions at field level.
Engage limited number of partners	Use of few partners with existing capacity and presence can ensure speed with consistency and streamlined coordination
Engineering assessments are crucial	Engineering assessments, including analysis of local materials and construction methods, should be carried out early to inform Program policy and strategy.
Limited role of Partner Organizations / NGOs in survey	NGOs will be reluctant to arbitrate over funding decisions for fear of severing ties with communities, and thus are less suited for an eligibility verification exercise. They are better suited for social mobilization support roles, a capacity that most technical institutions lack.



Housing Project

Form Number 733750

ERRA

Earthquake Reconstruction and Rehabilitation Authority

Date DD MM YYYY

Detailed Visible Damage Assessment

Cross Reference with Army/Govt Survey Serial Number | Damage Category: Livable / Unlivable | Previously Payment Made: Yes / No | Engineer | Govt. Representative

1 - Location

1. Admin Code
2. Tehsil
3. Patwar Circle
4. Union Council
5. Village Name
6. Province / District: AJK (Muzaffarabad, Neelum, Bagh, Poonch); NWFP (Abbottabad, Battagram, Kohistan, Mansehra, Shangla)

2 - Family Information

7. Occupant's Name
8. Father's Name
9. NIC/CNIC Number
10. Land Ownership
11. Gender: Male / Female
12. Age (Years)
13. Marital Status: Married / Unmarried / Divorced / Widow / Separated

3 - Applicant's Bank / Post Office Information

14. BANK / POST OFFICE / NO ACCOUNT

Post office/Bank Branch Address

15. Title of Account (Must be same as Occupant's Name)
16. Account Number
17. Name of Post Office/ Bank
18. Post Office/Bank Branch Address

4 - House Description

KATCHA: Type of Roof – Wooden Beams With Mud Covering; Others; Type of Wall – Masonry in Mud Mortar; Others

OR

PUCCA: Type of Roof – Wooden Truss With CGI Sheets; Steel Truss With CGI Sheets; Reinforced Brick Masonry Slab; Reinforced Concrete Slab; Others

Load Bearing Masonry: Rubble masonry in Cement/Sand Mortar; Dressed Stone Masonry in Cement/Sand Mortar; Brick Masonry; Concrete Masonry; RCC Band at Plinth; RCC Band at Lintel

5 - Screening Criteria Triggering Reconstruction Grant

		Yes	No
A.	Completely Destroyed/ Partially Collapsed (above 25% of Covered Area)		
B.	Structurally Damaged Katcha House		
C.	Ground Failure Endangering Building Safety		
D.	Less Than 250m From a Visible Fault Line		
E.	Other Aspects of Layout / Designs That May Endanger Structural Stability, e.g. House Abuts/ Retains Hill Side Fill		

6 - Type of Damage

LOAD BEARING WALLS: Fully Collapsed; Partially Collapsed; Length of Wall with Major Cracking; Length of Wall with Minor Cracking; Length of Wall out of Deflection

RCC COLUMN: Spalling of Concrete / Major Damage; Total no of RCC Columns; Number of Structurally Damaged Columns; Corners – Number of Opening of Corners

RCC BEAMS: Spalling of Concrete/ Major Damage; Total no of RCC Columns; Number of Structurally Damaged Columns; Roof – Visible Deflection/ Sliding / Tilting of Roof

7 - Degree of Destruction

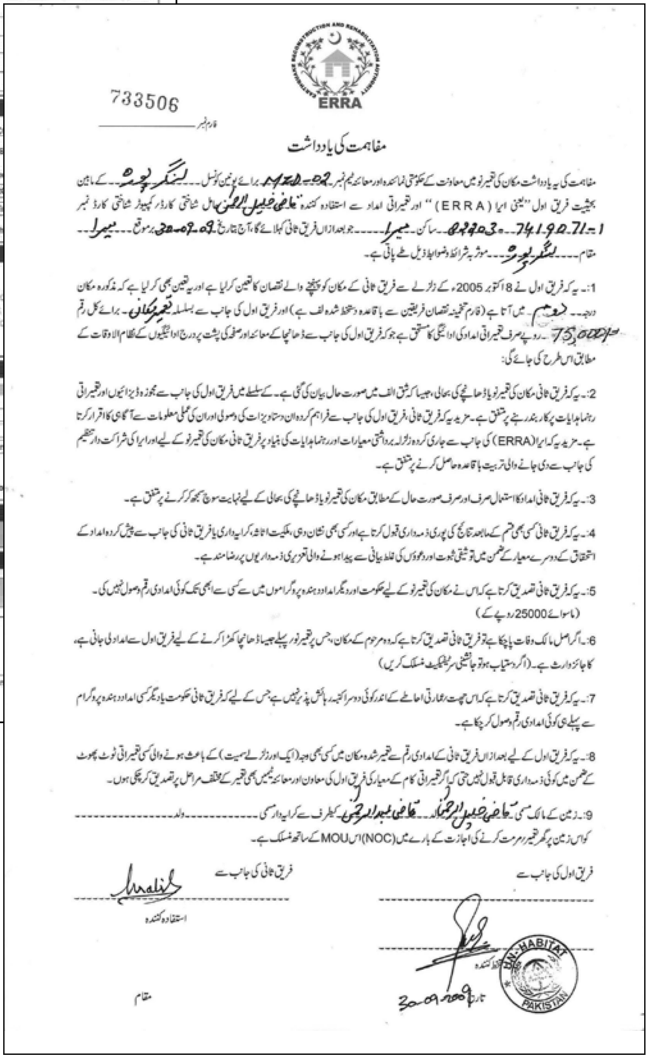
Completely Damaged / Structural Damage Beyond Repair | Repairable Structural Damage | Negligible Structural Damage

8 - Present State of building now

No Construction | Foundation: Started / Completed | Walls: Started / Completed | Roof

Name and Signature of Engineer | Name and Signature of Social Organizer

Detailed Damage Assessment and Beneficiary Eligibility Verification Form



733506

ERRA

مفاہمت کی یادداشت

Memorandum of Understanding signed between each beneficiary and ERRA

Ceremony commencing housing grant payments.

Chapter 4
Grant Payment Mechanism

Why Needed?

Once beneficiary eligibility for housing grants has been determined, and decisions regarding key elements of program design made, grant payments to beneficiary households need to begin. A mechanism needs to be created that supports the individual household-nature of an Owner-Driven Program, in which grants need to be disbursed to each household separately rather than to a collective entity such as a contractor or even a community organization. This mechanism also needs to take into account potential leakages in the transfer of funds to a large caseload, and must ensure this is minimized.

A further layer of complexity that needs to be accounted for is the tranche-based nature of grant disbursements, especially in such a Program where disaster-resistant construction is a pre-condition to receive grants. Here, the grant payment mechanism needs to be closely tied to beneficiary eligibility as well as the inspection and certification regime. The process needs to be efficient enough to cater to a large caseload of incremental disbursements as houses are rebuilt step-by-step.

Suggested Results Framework

A Results-based approach can be used to manage and monitor this part of the Program. A suggested Results Framework is presented below. While this relates to a post-earthquake context, the Framework, and the concept in general, can be applied with equal validity to other disaster contexts such as floods and tropical storms.

Component: Grant Payment Mechanism	
Component Objective	**Component Outcome Indicator**
Successful disbursement of housing reconstruction/repair grant to all beneficiary households in tranches linked to certification of seismic-compliant construction	% of eligible beneficiaries receiving all tranches of restoration/ reconstruction grants
Documentation of economy and prevalence of bank-based transactions outside of Program	% of beneficiaries regularly operating bank account outside of Program grants (such as to receive migrant worker remittances)
Intermediate Outcome	Intermediate Outcome Indicator
All beneficiaries able to receive housing grant in bank account or alternative savings/deposit mechanism (such as post office savings account)	% of eligible beneficiaries that opened bank account due to Program, out of those that did not have bank account pre-disaster
	% of eligible beneficiaries with functioning bank accounts or formal savings/deposit mechanism ‘x’ months after start of Program
	Financial MIS developed that is linked to beneficiary eligibility database and any available national identity database
	% of financial transactions involving Program grant disbursements completed via beneficiary bank accounts

Achieving Program Results – The Pakistan Experience

Housing Grants Disbursements Directly to Beneficiary Bank Accounts

Beneficiary households were provided tranche-based financial assistance at various stages of the Program, dependent upon them meeting certain criteria for eligibility and seismic-resistant reconstruction agreed to in the MoU (signed at the time of the comprehensive damage assessment survey).

Each beneficiary household, once declared eligible, was required to open a bank account to enable direct transfer of funds, thereby bypassing middle men and enhancing transparency. Opening of bank accounts for beneficiaries living in inaccessible, remote, dispersed, rural areas required significant mobilization and support from partner banks and development finance institutions, and represented a key achievement of the Program. The central bank (State Bank of Pakistan) played a critical role by relaxing account opening requirements in the affected areas and providing customised guidelines to commercial banks for them. The commercial banks in turn rose to the challenge, and mobilised mobile banking outfits across the affected area to facilitate opening of the accounts. This post-disaster grant payment mechanism set an important precedent in Pakistan, which has since been further refined. Following the conflict in Swat, and the massive 2010 and 2011 floods across the country, beneficiaries were provided relief grants by the government through a centralized system of debit/ATM cards.

The Grant Payment mechanism was intimately tied to the Assistance, Inspection, and Certification regime, as the inputs from the latter led to subsequent grant tranche releases. This required significant mobilization in the field of Assistance and Inspection (AI) teams that visited each beneficiary dwelling multiple times over the course of the program (4 times for destroyed houses needing full reconstruction, 2 times for damaged houses needing repair). These teams certified the phased construction/repair of houses to seismic-resistant standards. Once this certification was processed by a centrally managed beneficiary database, grant payments for that particular phase/tranche were released directly into beneficiary bank accounts. (Details on this mobilization effort for Assistance, Inspection and Certification are presented in more detail in a separate chapter). A brief overview of this tranche-based assistance regime is given below:

Table 6: RHRP Tranche-Based Financial Assistance Regime

Fully Damaged / Destroyed Houses	Cash Grant	Payment Triggers	Operational Procedures
First Instalment	PKR 25,000	Preliminary Housing Damage Determination	Preliminary Housing Damage Determination by various government agencies
Second Instalment	PKR 75,000	Housing Damage Categorization & Beneficiary Eligibility Verification	Damage Assessment and eligibility confirmation by Survey Team; Signing of MOU
Third Instalment	PKR 25,000	Completion of Plinth	Technical Inspection
Fourth Instalment	PKR 50,000	Completion of wall and super structure up to Lintel level	Technical Inspection
Partly Damaged Houses	Cash Grant	Payment Triggers	Operational Procedures
First Instalment	PKR 25,000	Preliminary Housing Damage Determination	Preliminary Housing Damage Determination by various government agencies
Second Instalment	PKR 75,000	Housing Damage Categorization & Beneficiary Eligibility Verification	Damage Assessment and eligibility confirmation by Survey Team, signing of MOU

Schematic Description of Grant Payment mechanism

The following figure provides a snapshot view of the various steps involved in the grant payment mechanism, including the use of the individual-level National Identity database and bank accounts.

Fig. 2: RHRP Grant Payment Mechanism

Damage Assessment Survey Inspection

Beneficiary eligibility determined + MoU with beneficiary signed

Beneficiary data entered into database

Beneficiary Computerized National Identity number, bank account details, MoU details, damage criteria. Managed centrally.

Release of second tranche into bank account

Second of four tranches for reconstruction, Final tranche for repair.

Inspection and certification of construction and seismic compliance at PLINTH level

Conducted by Assistance and Inspection (AI) teams

Plinth-level certification confirmation sent to database

Sent by AI teams to centrally managed database, which then forwarded data to Program central administration and banks

Release of third tranche into beneficiary household's bank account

Inspection and certification of construction and seismic compliance at LINTEL level

Conducted by Assistance and Inspection (AI) teams

Lintel-level certification confirmation sent to database

Sent by AI teams to centrally managed database, which then forwarded data to Program central administration and banks

Release of fourth and final tranche into beneficiary household's bank account

Beneficiary receiving compliance certificate confirming adherence to seismic-resistant standards, following inspection by an AI team.

Key Risks and Challenges

Risks / Challenges	Mitigation tools
Risk of Leakage of grant funds intended for beneficiaries	This risk was eliminated by the use of direct transfers to bank accounts of beneficiaries; a significant effort was required to bring banking services to remote rural areas outside the banking net.
Opening of Bank accounts: Over 50% beneficiaries did not have existing bank accounts and had to be brought into this net to facilitate direct bank transfers of grants	The Program central implementing agency worked with the Central Bank (State Bank of Pakistan) to relax account opening requirements for commercial banks and development financing institutions in the earthquake affected areas. Banks were encouraged to send mobile banking outfits to remote areas. Moreover, accounts in post office and national savings schemes in lieu of banks were also accepted.
Ensuring timely disbursements of financial assistance for Program Credibility	Accelerated effort was made to complete the eligibility survey within four months, and beneficiary database was created immediately after. All first tranche (temporary shelter support) payments were made by end-2005 and all second tranche (mobilization for construction) payments by end-2006.

Lessons Learned – Considerations for Future Programs

Information and Data Management is critical	A comprehensive information management system based on the existing national Computerized National Identity Card database supported the implementation of the Program, which relied on a large volume of individual household data. Such information needs should be planned for at the outset of the Program.
Bank transfers are possible	Despite the low rate of bank accounts in the affected area pre-disaster, the rural dispersed and isolated settlement patterns and low levels of literacy, over 611,000 accounts (including 300,000 new ones) were successfully used for direct transfers of grants. This required planning with banks and resolution of many practical issues.
Link financial assistance with grievance redressal mechanisms	Since financial assistance in such a Program will often be its key component and incentive for the beneficiaries, robust grievance redressal mechanisms that are also able to deal with financial disbursement and eligibility matters on an expedited basis are critical.

Existing construction techniques made seismic-resistant through introduction of requisite structural elements.

Chapter 5

Seismic-Resistant Structural Design Solutions

Why Needed?

Natural disasters adversely impact on private housing the most – inevitable given that houses are the most commonly prevalent structure. The design and materials used in construction can be a significant factor in determining the extent of damage caused by a disaster. Post-disaster reconstruction provides an opportunity to ensure that optimal structural designs and materials are used to minimize the risk of damage in the event of a future disaster.

Suggested Results Framework

A Results-based approach can be used to manage and monitor the development of a menu of hazard-resistant structural design options, through a suggested Results Framework presented below. While this relates to seismic-resistant designs in a post-earthquake context, the concept can be applied with equal validity to other disaster contexts as well.

Component: Seismic-resistant Structural Design Solutions	
Intermediate Outcome	**Intermediate Outcome Indicator**
Development of seismic-resistant structural design standards based on familiar materials and methods	Review and assessment of prevalent materials and methods for seismic considerations, especially including documentation of common vulnerabilities such as faulty construction practices causing building collapse/damage
	Development of affordable seismic-resistant structural standards based on global best practices
	Mechanism established for review and additions to menu of structural designs
Concurrent development and implementation of Cascaded Training for optimal results	Training materials and curricula developed to educate master trainers, field staff, artisans, and affectees on appropriate implementation of seismic-resistant structural design solutions
	Model houses and demonstration details constructed at field level to provide hands-on training and samples for reference.
Compliance Catalogue developed	Menu of approved seismic-resistant structural designs consolidated in catalogue form, along with solutions for common problems of non-compliance
Non-Compliance Referral System established	Data on non-compliant construction used to mobilize AI and training teams to areas with high rates of non-compliance
	Non-Compliance Referral System (NCRS) developed for recurrent cases of non-compliance providing detailed technical advice through trained engineering staff

Achieving Program Results – The Pakistan Experience

In rural areas in Pakistan housing was not subjected to any building control or technical supervision, but built using prevalent methods and materials, which had limited ability to withstand extreme events. The massive loss of life and damage after the 2005 earthquake was mainly due to these significant deficiencies in practices and flawed construction techniques. The area had known seismic activity before, though not on this scale. While traditional construction techniques catered for stability, over the years they had been given up for the sake of economy. The inhabitants of the region had been building their houses according to their needs and means, with little thought to safety. The trade-off between more robust but expensive construction and risk mitigation did not seem justified for most people with limited means, and given there had been no recent history of a major earthquake.

After the 2005 earthquake in Pakistan, there were calls to improve the quality of prevalent construction methods, not only from the development partners but also from the affectees themselves. While the calamity was major it provided an excellent opportunity to apply lessons and 'build back better'. The prospect for providing improved housing using requisite structural standards, and introducing materials and construction methods able to withstand hazard-risks needed to be exploited.

A **two-pronged approach** was developed for seismic-resistant reconstruction: a) the development of appropriate construction standards and structural design options using local materials and knowledge; and b) large-scale training of a critical mass of masons and artisans as well as homeowners in the use of these standards to enable them to reconstruct their houses in a safer manner. Training is discussed in the next chapter.

With regard to designs, the RHRP enabled a wide range of construction choices balancing owner needs with a dynamic process of rigorous technical considerations for seismic resistance. A menu of seismic resistant structural designs was developed, based on familiar materials already prevalent in the region. These included stone, brick, or concrete block masonry with seismic-resistant structural elements for walls, and lightweight wood and CGI sheet roofs. The traditional methods of construction practiced in KP and AJK were also assessed and 'Bhatar' technique, using wood bracing in walls of stone masonry, was found to be adequately seismic-resistant. Bhattar was thus included in the menu of options. Lastly, for beneficiaries choosing to construct concrete roofs, a reinforced concrete frame structure was also provided as an option.

This section uses the Results Framework provided above to elaborate on how the suggested results were achieved in the Pakistan post-earthquake context. There is special emphasis on the processes and steps used to manage the process of seismic-resistant design solutions.

Development of seismic-resistant standards based on conventional technologies

The seismic-resistant structural design options and standards were based on global best practices for non-engineered construction. A key consideration in the design of these standards was to ensure their **affordability**, in view of the majority of the affected population being the rural poor.

As a first step, extensive field assessments and desk research was conducted to understand the prevalent local construction techniques, and how they behaved during the earthquake. This led to an understanding of causes of collapse including weak detailing, poor workmanship, and lack of quality assurance in general, and absence of seismic-resistant features in particular. This led to the development of seismic-resistant structural design options and standards based on materials that were locally familiar, but used in a manner that ensured higher safety standards.

During the implementation of the RHRP, more structural design options were added to the menu, taking into account additional local preferences. The following steps were involved in the process of formally assessing a range of local methods and materials for exclusion or inclusion in the menu of endorsed construction standards:

- Physical survey and documentation of housing typologies, construction materials and methods;
- Detailed physical and non-physical assessment of damaged buildings;
- Discussions with artisans and homeowners on range

of practice in given typology and materials;
- Basic engineering analysis of structural behaviour, sharing of field information, and dialogue with engineering experts;
- Consolidated documentation and analysis of field information and reference material to establish engineering assessment and determine recommended standards;
- Submission of draft standards and menu of structural design options for review and comment;
- Approved standards and options disseminated to field through training and information dissemination. Guidance materials communicated with theoretical and practical exercises and examples, including demonstration/model houses;
- Continued research carried out at field level to identify priority needs for information, emerging issues and constraints to devise appropriate advice and solutions.

The scale of the damage incurred by the earthquake influenced the federal government to undertake a seismic zoning of the entire country, and a review and update of relevant building codes to account for seismic risks. Moreover, elements of the training curriculum for seismic-resistant construction (discussed below and in separate chapter on training regime) were eventually incorporated at national level in technical and vocational training programs for the construction sector.

Concurrent development and implementation of cascaded training for optimal results

After the establishment of seismic-resistant construction standards, a comprehensive Training Program was developed based on a '**cascaded training**' model to train master trainers, masons, and craftsmen in the use of these methods and standards in the field. (Refer to separate section on Training and Capacity Building for more details.)

Development of compliance catalogue

With a number of design options floating in the field, there was a risk of confusion on the appropriateness of each option; especially when an element of financial assistance based on the use of those options was involved. Moreover, actual reconstruction practice in the field could deviate from ideal standards, with homeowners and artisans introducing modifications and alterations that compromised the seismic-resistant features of the houses. To counter these issues, a Catalogue of Compliant Construction for Rural Houses was published a couple of years into the Program, which served the following functions:

- **Consolidating the menu of approved structural designs and construction methods:** The menu of approved structural designs and construction methods had been undergoing revisions based on feedback from the field and implementation experiences. It was pertinent to consolidate all related information to avoid confusion or misunderstanding. The issue of an incrementally expanded menu of structural design options was cumbersome for various stakeholders involved in implementing the RHRP. The Compliance Catalogue consolidated the approved standards into a single reference document.
- **Providing solutions for non-compliant construction:** The second objective of the Compliance Catalogue was to communicate remedial measures and advice for those homeowners who, due to lack of information or availability of requisite materials, had constructed structures that could not be certified as compliant to be eligible for subsequent grant tranches. The Catalogue provided step-by-step graphics and explanations for measures to be implemented for mistakes found to be recurrently made. This was also important in helping provide systematic guidance on repair and retrofitting of earthquake-affected houses to structurally acceptable standards.

Establishment of non-compliance referral system

The RHRP needed to monitor and analyse seismic compliance on a vast scale in real time and to determine trends in non-compliance that could be systematically be responded to. A robust Reporting, Monitoring, and Evaluation (RME) system was established to achieve this, details of which can be found in a separate section. In the Pakistan context, the following two activities were undertaken complementary to the RME system that helped detect and correct the practice of non-compliant construction.

Targeted Campaigns To Disseminate Remedial Measures: A couple of years into the implementation of the Program, the RME system was fully operationalised (refer to separate section on RME), enabling periodic reporting of levels of seismic compliance in reconstruction, segregated geographically. This enabled the RHRP team to determine which areas were systematically weak in seismic compliance, allowing them to design targeted campaigns aimed at these specific areas. Moreover, this information was fed back to the AI teams and PO field staff, enabling them to focus technical assistance on masons, craftsmen, and homeowners for achieving seismic compliance. This often took the shape of introducing remedial measures to already constructed buildings that were not in compliance with seismic standards, using the Compliance Catalogue.

Non-Compliance Referral System: A high proportion of non-compliant construction had similar and common defects, which could be rectified through consistently applied remedial measures shared through the AI teams and PO field staff. However, there were still a significant number of cases of non-standard construction, or with complex or compounded defects which required customized assessment and advice beyond the technical capacity of the AI teams. The Program response was to establish a Non-Compliant Referral System (NCRS), where joint PO technical assessment teams were constituted to inspect a caseload of over 8,000 houses. Wherever possible, decisions and advice were issued at site by the engineers on the teams. However, where the defects were more complex, the detailed information was forwarded to senior engineering staff located centrally to provide appropriate solutions where possible. Cases were compiled and shared with all Housing Reconstruction Centres at the district level, as a process of continuous cross learning and consistent information sharing, including review of new construction problems, discussion of solutions, sharing of best practices, and documentation.

Concurrent and Complementary Program Aspects

While the steps and processes described above provide a comprehensive picture of the development of hazard-resistant structural design solutions, they must be complemented by concurrent processes and activities at a Program level to deepen and consolidate gains from this component. Some of these components are described in the table below. All of these are covered in separate chapters in this Toolkit, which can be referred to for further details.

Concurrent preparation of communication materials (refer to relevant chapter)	All standards and guidance were developed into training and information materials for communication and dissemination with illustrations for clarity, and translation into local language. Technical teams responsible ensured consistency.
Development of building materials supply chain and hubs to ensure availability of construction material (refer to relevant chapter)	Since seismic-resistant reconstruction required availability of certain essential materials, it was necessary to ensure their adequate and timely supply and continuing availability. ERRA helped establish private sector-led building materials supply chain and hubs to ensure availability with requisite quality.
On-going inspection and enforcement of seismic-resistant standards (refer to relevant chapter)	The ‘build back better’ strategy was ensured by the AI and training regimes to ensure seismic compliance. Absence of pre-earthquake enforcement mechanisms meant that a new system had to be devised to ensure adherence to given standards under the RHRP.

Lessons Learned – Considerations for Future Programs

Local construction methods not well documented and difficult to scientifically test or endorse	Local construction methods were not previously well documented, and required time to analyse and improve for adequate seismic-resistance. The use of local methods and familiar materials in reconstruction was a success of the Program, but required effort and persistence. Further, even with field evidence, it is difficult to engage in engineering arguments based on code and precedent or numerical analysis, none of which are conducive to analysis of local materials and technologies. A peer review process or other system of engineering review should be established to determine who controls decision making on standards.
People build early, and policies and strategies are always catching up with them	Housing reconstruction starts earlier than other sectors and people commence work when they are ready and able to do so. It is important that policies, standards and support systems are devised and in place in time to ensure people are aware of terms and conditions of financial support and can access technical advice in time to make use of it. In Pakistan, the establishment of housing reconstruction centres (HRCs) in affected districts was limited for the first one year and could not address the need to disseminate advice and information to those households who started early.
Early advice for repair and retrofitting is essential	Since the case load was predominantly of Katcha houses that were deemed candidates for reconstruction, the RHRP focused on standards and specifications for new construction at the outset, and advice for appropriate repair and retrofitting commenced later. Technical advice for repair and retrofitting needed to be available as early as possible.
Single source information, consistency and accuracy in standards	The Program established a centralized role of approval of all technical standards, training curricula and public information materials to be used or circulated by all implementing partners. This was based at ERRA, the central implementing agency. This was critical to ensure information used in technical assistance and all information reaching beneficiaries was accurate and consistent.
Optimised choice and introduction of safer practices	Instead of providing architectural designs, the Program provided a range of structural design options and general guidelines for seismic resistance. This allowed for choice and interpretation according to site, budget and aspiration of households. Individual choice was optimized while safety standards were adhered to.

A cascaded training program ensured technical training of, and information sharing with, all relevant stakeholder groups.

Chapter 6

Training and Capacity Building

Why Needed?

Rural settings generally have minimal existing practice or culture of disaster-resistant construction; this can be a major cause of heavy destruction and damage to houses. In order to improve housing and living conditions compared to what they were before a disaster event, training – both in terms of skills upgradation and work practices – needs to be provided to various stakeholders engaged in the process. Without this, it is highly likely that houses will be rebuilt more or less with the same materials and methods as before. In particular, it is likely that the necessary disaster resistant measures will not be incorporated into the structural details, leaving households vulnerable to future disaster risks.

Such a training regime is also needed because of the expected building boom in the disaster-affected areas that pushes construction activity far above normal levels, and the livelihood opportunities thus generated which attract migrant workers from other areas to take part in this construction activity.

In order to be effective, training needs to be provided to all stakeholder groups involved in the reconstruction program. This includes the technical advisors and those responsible for supervising the Program; those involved with various surveys and data collection processes of damage assessment; skilled and unskilled craftsmen (masons, carpenters, electricians, steel fixers, labourers) undertaking construction; down to the affected households and communities themselves. Moreover, very little of the training should be provided through formal classroom instruction; most will have to be on-the-job hands-on training delivered in the field and at the individual construction sites.

Suggested Results Framework

Component: Training and Capacity Building	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Development of Training curricula to implement adoption of disaster-resistant solutions	Training materials and curricula for disaster-resistant design solutions developed for various tiers - master trainers, partner organisations' staff, artisans and construction workers Model houses and demonstration details constructed at field level to provide hands-on training and evidence of disaster-resistant solutions
Training of a critical mass of craftsmen and construction workers across disaster-affected area in disaster-resistant construction techniques	% of affected area where training in disaster-resistant construction techniques has been provided at field level to craftsmen and labourers # of master trainers/trainer of trainers trained in disaster-resistant construction standards # of masons/artisans/craftsmen trained in key trades Database created for trainings provided, and linked to other Program databases
Prevalent use of disaster-resistant construction standards in reconstructed houses	% of grant beneficiaries sensitized to disaster-resistant construction of houses % of houses reconstructed/repaired using disaster-resistant standards (Rate of disaster compliance)
Institutionalized support for disaster-resistant construction in disaster-affected areas and beyond	Introduction of disaster-resistant construction standards training in national or sub-national level vocational training programs

Achieving Program Results – The Pakistan Experience

The reconstruction and repair of around 600,000 houses in scattered rural communities across a difficult mountainous terrain to seismic-resistant standards required a vast adequately skilled and trained workforce. Thus, during Program implementation, a **'Cascaded Training Regime'** was implemented throughout the affected area to create a critical mass of artisans, masons, craftsmen, and construction workers skilled in seismic-resistant construction methods, and ensure that affected homeowners and communities were well informed about it.

The 'Cascade' was envisaged to provide training to master trainers, who would in turn train the technical staff of Partner Organizations (POs) as field trainers, who would then train artisans, masons, craftsmen and the affected population in the widely scattered communities of the affected area. Included in this was the construction of model houses. Relevant staff of all Housing Reconstruction Centres (HRCs) at the district level, PO Program staff, and AI teams was trained in the approved standards and seismic-resistant construction methods. Refresher training was provided at regular intervals to ensure consistency in Program communication and execution. Standards were promoted through principles and structural details rather than fixed architectural designs.

A large set of communications material was developed to promote and explain the various seismic-resistant design solutions. This material presented structural design options in a step-by-step manner that was simple to understand. Extensive trainings were provided to the technical staff belonging to Partner Organizations in the use and dissemination of these materials. (Also refer to separate chapter on Public Information Campaigns.)

The strategy used was to establish a corps of master trainers to operate at the district level to train field-level trainers from Partner Organizations, who would in turn train field mobile teams, who would finally train the masons and artisans. Once the training curriculum was designed, the implementation of the cascaded training model could commence.

Development of training curricula to implement adoption of seismic-resistant solutions

At the central level, ERRA and its key partners managed the development and approval of curricula for training of various stakeholders to ensure consistency in training. This curriculum was developed at the Program headquarters with extensive assistance from national and international partners, and with input from a range of technical experts. Once developed, this training curriculum was authorized by the Program management and implemented through the cascaded training approach. Agreed curricula at all levels and a centralized corps of master trainers as resource persons ensured consistency across the program, and adherence to the centrally approved structural standards of seismic-resistant construction.

Included in this training regime was the construction of model houses at field level to function as a practice and demonstration technique in seismic-resistant construction techniques. These houses were built at Housing Reconstruction Centres at the district level, and used to provide trainings to masons and craftsmen. After the trainings concluded, these houses were left in place for continuous demonstration. The masons and craftsmen that underwent this training program were certified, to provide assurance to homeowners about their suitability for the reconstruction and repair of their houses.

A schematic diagram below provides a summary of this 'cascaded training' model that helped build a critical mass of masons and construction workers trained in seismic-resistant construction techniques.

Figure 3: RHRP Cascaded Training Model

Federal and Provincial/State Level	
Program HQ and implementation partners	Preparation of Common Curricula Training of Training Co-ordinators (22)
District Level	
Establishment of Housing Reconstruction Centers (HRCs)	Training of Master Trainers (MTs) of Partner Organizations (POs)
Union Council Level	
Mobilization of Partner Organizations (POs)	Training of Craftsmen and Beneficiaries; Community Information Campaigns; Training of Mobile Training Teams
Village Level	
Field-level Mobile Training Teams	Training of Craftsmen and Beneficiaries Technical Assistance to Homeowners during Construction

List of responsibilities for entities involved in training

In a Program component that relies on a 'cascade' approach for transfer of knowledge, it is essential that responsibilities are clear at each tier – and each implementing partner is aware of and comfortable with them. In the case of RHRP, the Training and Capacity Building component relied on clearly-defined roles and responsibilities for smooth implementation by each entity/tier as provided below:

Entity	List of Responsibilities
Program central implementing agency (Earthquake Reconstruction and Rehabilitation Authority) + Provincial/ State Reconstruction Authorities	■ Overall coordination and program management; ■ Repository and Manager of overall information, including Training MIS ■ Design and approval of centralized curricula for training of various stakeholders to ensure consistency in training
Housing Reconstruction Centres (HRCs) – at least one in each affected district; two in larger districts - 14 in total	■ Training to Partner Organization (PO) Master Trainers in the District ■ Quality control of training delivered by master trainers ■ Information Dissemination at District Level ■ Coordination across POs operating within District ■ Point of technical support and reference for beneficiaries
Partner Organizations (POs) –27 POs in 232 Union Councils.	■ Training of craftsmen and homeowners at the Union Council and village levels through mobile training teams ■ Technical advice to beneficiaries during reconstruction ■ Social mobilization through community outreach teams and Village Reconstruction Committees
Pakistan Army - as a PO for Training (as well as the Assistance & Inspection (AI) and Detailed Damage Assessment and Beneficiary Eligibility Survey)	■ Training of artisans & homeowners at the Union Council and village levels through formation of mobile training teams (MTTs) ■ Technical advice to beneficiaries during reconstruction through Progress Monitoring Teams (PMTs) and AI Teams ■ Social Mobilization through MTTs and PMTs

Prevalence of seismic-resistant features in houses built outside rhrp

A post-disaster reconstruction program that requires incorporation of disaster risk reduction features within the reconstruction regime needs to also strive to translate such practices into the prevailing construction norms of the affected area. A well designed and implemented training component, which builds a critical mass of stakeholders well-versed in disaster-resilient construction, can help achieve this purpose. Its success will be evident if construction activity outside the scope of the reconstruction program – with owners' own funding - also follows disaster-resilient construction standards required by the Program.

This was an aim of the Rural Housing Reconstruction Program as well. Significant efforts were made to ensure that the Training and Capacity Building component achieved strong results. Evidence suggests that construction activity in the affected area during Program implementation, as well as after its completion but outside its scope, also adhered to seismic-resistant construction standards. Residents of the affected areas, when adding rooms to the core housing unit provided under RHRP from their own resources or building new houses on their own, tended to mimic the structural design features and construction practices developed in the Program.

Key elements that contributed to a wider adoption of seismic-resistant standards included: the robust communications program that educated communities on the risks of sub-standard building construction; the robust training regime that built a large cadre of masons and construction workers well-versed in these practices; availability of requisite building materials at relatively affordable prices due to the creation of a building materials supply chain. Finally, the training curricula was adopted by national-level vocational and technical training institutes and thus institutionalized across the country.

Three-pronged approach for Information Sharing and Training

In order to ensure the strength and consistency of the messages on seismic-resistant construction, the Training component was designed to be part of a three-pronged strategy for information sharing, so the message would effectively reach affected communities. The other two components of this strategy were a Public Information and Behavioural Change campaign and direct assistance to beneficiaries by the AI teams. In concert, these three **separate but complementary** approaches combined to create a consistent and repetitive messaging to beneficiaries on the importance of seismic-resistant reconstruction.

Stakeholders and Nature of Trainings: Since the training and capacity building component of the Program relied on a large number of entities at various tiers, different kinds of training curricula were designed catering to the unique requirements of different recipients of trainings as detailed below:

a) **Architects and Engineers** were to function as a core group of professionals who would support training activities, as well as be a part of the Technical Advisory group for ERRA. However, the majority of architects and engineers had little previous experience in stone or timber construction, heavily used in the affected areas but not in the rest of the country. For them practical training was declared mandatory.

b) **Artisans and Craftsmen:** These were required in very large numbers to support the reconstruction activity to required standards. Their trainings were conducted in HRCs (District level), PO field offices (at Union Council level) and in villages. Moreover, hands-on training was provided through construction of model houses and structural details in the communities. The trainees were paid a stipend to reduce the opportunity cost of attending training (foregone income due to missed work), and ensure attendance and interest. On successful completion, the trainees were certified.

c) **Community Representatives and Homeowners:** These were required to attend half-day orientation sessions to introduce seismic-resistant techniques and their benefits, and to encourage them to ensure that artisans in their area adhered to these during construction of their houses, as well as those of other community members.

Course Correction and Responding to Emerging Challenges

An important feature of the Program as a whole, that played a key role in its remarkable success, was the focus on learning from experience during implementation, and adjusting processes based on this. The Training and Capacity Building component was no different, and the following **course corrections** were made to respond to unexpected challenges or new developments:

Low NGO Capacity in Affected Areas: The Training and Capacity Building Program was designed based on the assumption that NGOs would quickly mobilize in the field and transition from relief work to reconstruction. However this did not happen extensively due to low NGO capacity to impart trainings across the board to affected communities. Thus, where there was a gap in NGO presence, the Pakistan Military agreed to fill it and serve as a PO.

Modified role for Field Training and Inspection Teams: The initial strategy for the Program envisaged dual Training and AI roles for the PO mobile teams. However, this could not materialize due to capacity constraints of the POs. Therefore, very early in the implementation of the Program, the AI responsibilities were handed over to mobile teams of the Pakistan Military. These teams had already conducted the Detailed Damage Assessment and Beneficiary Eligibility Survey, and were familiar with the caseload. They now took over inspections of reconstruction sites, once the requisite construction stages had been reached and homeowners had made requests for certification to enable disbursement of the next grant tranches. These teams also provided on-the-spot assistance and training on seismic-resistant standards, if during an inspection visit the construction was found to be non-compliant. The regular trainings for masons and craftsmen were run separately as described in this section, with POs predominantly taking the lead.

Lessons Learned – Considerations for Future Programs

International experience in training on seismic-resistant construction techniques proved invaluable	Given the low understanding of seismic-resistant construction methods in Pakistan, the Program was fortuitous to benefit from a team of experts from Nepal (NSET) that provided help from the onset in developing the curricula and training of the master trainers for the Training Program. NSET's rich previous experience proved invaluable in launching the training program on a sound footing.
NGO capacity can be limited in the field, and inconsistent over time, especially regarding 'soft' components such as Training	NGO capacity to act as Partner Organizations for the entire affected area as well as the duration of the Program was over estimated. In reality NGOs were only able to cover 60% of the total affected Union Councils. Moreover, due to lack of experience, projections of their funding requirements and thus allocations, soon fell short and they struggled to increase their portfolio of trainings.
Long-term donor funding can be less certain for intangible, 'soft' components such as Training and Capacity Building	Since training is a less tangible part of the overall Program, it risks being underfunded and under-coordinated. This can undermine overall Program objectives because the necessary push towards a seismic-resistant culture needs an institutionalized and far-reaching training program that is well-funded and consistently implemented.
Migrant labour for construction activity may have interests different from Program objectives	Migrant labour posed somewhat of a challenge for the Training regime. Migrant labour began operating in the disaster-affected areas due to the construction boom, but migrant artisans were less keen to adopt seismic-resistant construction standards.
Post-disaster construction booms leads to unskilled, non-experienced workers entering the workforce	The construction boom in the affected areas attracted many unskilled individuals to the construction sector as a source of livelihood (both migrant and local). The trainings were initially not designed for completely unskilled labour. Thus they had to learn advanced seismic-resistant skills during trainings, while learning basic construction skills on-the-job.

An AI team inspecting construction up to plinth level to determine eligibility for release of the next grant installment.

Chapter 7
Assistance, Inspection, and Certification

Why Needed?

Once the Program has been set in motion and reconstruction activity begun, a regime of assistance, inspection and certification needs to be instituted that will ensure homeowners are using grant payments for the purposes intended i.e. to reconstruct houses to disaster-resistant construction standards. A mechanism needs to be created that supports the individual household-nature of an owner-driven Program, where reconstruction is the responsibility of the beneficiary. This mechanism needs to ensure that significant technical assistance is provided to enable households to implement disaster-resistant construction techniques. This is particularly necessary when the Program relies on tranche-based grant disbursements, and the release of tranches is conditional upon meeting construction standards that are independently certified and verified.

Suggested Results Framework

Component: Assistance and Inspection Regime	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Development of Standard Operating Procedures and related Training curricula for implementation of Assistance and Inspection (AI) regime	SOPs for AI regime developed for assisting, inspecting, and certifying seismic-resistant construction Training curricula developed and Training provided to AI teams on processes and criteria for assistance, inspection, and certification
Mobilization of Assistance and Inspection teams in the field across entire affected area for entire length of the Program	# of Assistance and Inspection teams trained and mobilized in affected areas % of affected Union Councils (or equivalent administrative units) with field presence of AI teams 'x' months after Program launch
Synchronization of data streams from Assistance and Inspection regime with Program database, for effective monitoring and management	Data on construction and compliance updated in real-time after every AI team field visit to affected community Average time in # of days, between AI visit and recording of certification/ inspection data in central database (per UC)

Achieving Program Results – The Pakistan Experience

The disbursement of subsequent grants was subject to verification by the Assistance and Inspection (AI) teams for physical progress and **compliance with seismic-resistant standards**. These AI teams were responsible for conducting regular visits to affected communities and beneficiary households at various stages of the Program, and operated from AI hubs established at local level by Partner Organizations including the Pakistan Military. The AI teams comprised of trained personnel who had taken part in the Detailed Damage Assessment and Beneficiary Eligibility Verification Survey, and were thus well acquainted with local realities in the affected areas. The AI regime was closely linked to the Grant Payment mechanism as described in the separate section on that topic.

SOPs and Training curricula for implementation of AI regime

The first step in the AI process was development of technical reference materials enabling mobile field teams to provide optimal assistance, inspection, and certification for the reconstruction of houses to adequate structural standards. The technical reference documents included structural designs and construction guidelines, developed in consultation with national and international partners, and technical Standard Operating Procedures (SOPs) developed by the district-level Housing Reconstruction Centres (HRCs) run by POs. The next step was to train these teams on the use of these materials (see next chapter for details).

Mobilization of AI teams in the field

In order to achieve effective mobilization across the affected area, Assistance and Inspection Hubs (AI Hubs) were created at Union Council level where AI teams were based. The processes of inspection and certification consisted primarily of three stages:

a) The beneficiary households sent a 'request for inspection' after completion of construction up to plinth or lintel level. Once a large enough number of beneficiaries in a community had completed construction to a level needing inspection and had sent inspection requests, an AI team launched an inspection and certification visit to the community, thus ensuring optimal efficiency given resource and capacity constraints.

b) On arrival in an affected community, the AI teams followed technical SOPs based on plinth and lintel level inspection forms, and also conducted other tasks including giving advice on accessing grievance redress system, identification/confirmation of hazard risks identified earlier, and SOPs for relocation/resettlement of houses located at hazardous sites. Compliant construction was certified, and homeowners given a receipt, which when presented to their Bank branch would enable them to draw the next grant tranche.

c) After inspection visits, the AI teams undertook comprehensive data input, and the information was sent to ERRA as well as the database management agency (NADRA) for release of the next grant eligible tranches to each beneficiary account.

To the extent possible, AI teams should comprise the same individuals who earlier conducted the comprehensive damage assessment and beneficiary eligibility survey. This ensures that they are already trained on the caseload and become familiar with the affected areas as well as the communities. In the RHRP, it was originally assumed that staff of NGOs working in the area would constitute the AI teams. However, since PO capacity remained limited, the Pakistan Army engineering personnel, who had already undertaken the survey, were handed over the task.

Ensuring compliance

Although AI teams conducted formal inspections at the request of beneficiary households after completion of stages of construction, they also conducted regular periodic 'assistance missions' to monitor progress and quality of construction. This helped provide timely seismic-compliance advice on construction where required, in collaboration with training POs.

Where construction was found to be non-compliant and non-certifiable, the AI team advised the beneficiaries on ways to rectify the defects and request re-inspection after undertaking the suggested measures. In case beneficiaries were unable to independently rectify defects, AI teams arranged for technical assistance to be provided to them by POs working in the area, and local Village Reconstruction Committees.

Synchronization of data streams for effective monitoring & management

Inspection and Certification visits by AI teams comprise a key data input for such a housing reconstruction Program, as releases of tranched grants to beneficiary households depend on this process. It is thus critical that this data input is captured effectively and instantly by the Program data management system, to ensure quick and transparent disbursement of grants. Moreover, this data is also critical for monitoring and analysing trends in non-compliance, and can thus provide input at the right time to course correct and design customized interventions for relevant geographical areas and Program components to improve rates of seismic compliance.

In the case of Pakistan, the National Database and Registration Authority (NADRA) was a federal agency that already maintained a comprehensive individual-level database of Pakistani citizens to enable issuance of Computerized National Identity Cards. NADRA was tasked with centralized data management of the beneficiary grant database, and helped the Program in the development of software and MIS database for entry, screening/correction, and preparation of all data related to the Program.

This database relied on regular input from the AI teams after each visit to each reconstruction site. Data on construction and compliance at the beneficiary household-level was forwarded up the chain of command, to the Program headquarters and the database management authority where it was electronically managed. Relevant information was then immediately passed on to banks for grant disbursement, or Program teams for analysing trends in non-compliance.

Lessons Learned – Considerations for Future Programs

Training is critical for assistance, inspection and certification personnel	Training curricula and materials, and standard operating procedures were developed for the AI teams to enable them to carry out their roles effectively.
Use of the same individuals in Survey and AI teams can promote effectiveness	Many of the personnel who had been members of the survey teams carrying out the Detailed Damage Assessment and Beneficiary Verification went on to be part of the AI teams. This approach proved very effective as they were already familiar with the areas and communities assigned to them.
AI teams can play an important role in ensuring compliance	Along with inspection missions, AI teams also conducted regular periodic 'assistance missions' to monitor progress and quality of construction. This helped provide timely seismic-compliance advise where required. Where construction was found to be non-compliant and potentially non-certifiable, the AI team advised on ways to rectify the defects and request inspection after implementing the suggested measures.
Inspection and certification data input must be captured effectively and instantly by the Program data management system	The data entered by AI teams was critical since release of grant tranches was dependent on it. Moreover, it enabled monitoring and analysing trends in non-compliance, and thus provided timely input to course correct and design customized interventions for relevant geographical areas and Program components to improve rates of seismic compliance.
AI data should be linked to the main program beneficiary database	NADRA was tasked with centralized data management of the beneficiary grant database. Data from AI teams on construction and compliance at the beneficiary household-level was forwarded up the chain of command, to the Program headquarters and NADRA, where it was electronically managed. Relevant information was then passed to banks for grant disbursement, and to program teams for analysis and action as needed.

Please
- Use Black Ballpoint
- Use English Block Letters
- Write One Letter in One Box

ERRA

Earthquake Reconstruction and Rehabilitation Authority

MOU Number

Date DD MM YYYY

Plinth Level Inspection Certificate and Recommendation for Payment

A - Particulars of the Owner of the House

1. Mr./Ms./Mrs. (With whom MOU Signed)
2. W/o, D/o, S/o.
3. CNIC/ NIC.

B - Checklist for the Assistance Inspection (AI) Team

4. Type of Construction: Stone Masonry / Brick Masonry / Block Masonry / Other Specify
5. Percent Of Recycled Material Used: Stone / Brick / Block
6. Info of the Builder: Self-builder / Using Skilled Mason / Using Unskilled Labor
   (In case of Combination select Multiple)
7. Plinth Area Constructed ____ Sq. Ft
8. Maximum Room Size ____ Ft x Ft

C - Training

9. Has the Owner received an awareness briefing in seismic resistant construction? Yes No
   A. From Whom: PO / VRC / Others
10. Has the builder received specific training in seismic resistant construction? Yes No
   B. From Whom: VIL / PO / HRC
11. Has the Beneficiary used ERRA's Structural Designs & Construction Guidlines? Yes No
   A. If not indicate source used: Self Design / Others

PO: Partner Organization; VRC: Village Reconstruction Committee; HRC: Housing Reconstruction Centre; VIL: Village

D - Spot Checks AI Team

Mode of Checking Assessment (Verification Questions from the beneficiary / spot checks)

12. Is the house reconstructed on a non-hazardous site? Yes No
13. Depth of Foundation from Ground: ____ Inch
14. Width of Foundation: ____ Inch — S U
15. Type of Mortar ____ If Cement & Sand Specify Ratio: Cement / Sand — S U
16. Vertical reinforcement bars used in the walls: — Yes No
   Location: Corner Sutar / Joints Sutar / Walls Sutar Spacing(ft) — S U
   Anchorage below plinth level: Yes No — Grouting: Yes No — Yes No
17. Horizontal reinforcement bars used in the Plinth bands:
   Thickness: Inches / Size of main bar: Sutar — S U

* S: Satisfactory * U: Unsatisfactory

E - Certification by AI Team

18. Certified as built, subject to the following stated minor improvements (if any required)
19. Not Certified, Needs significant additional work to meet seismic guidelines and standards as listed below, This has been explained to the owner. Must resubmit requests for beneficiary inspection on completion.
   (Provide guidance notes/ Sketches and leave a copy with owner)

F - Recommendation for Payments by AI Team

20. The third instalment of Rs. 25000 from the Housing reconstruction Subsidiary be: Released / Not Released

Army Representative — Beneficiary — Government Representative

G – رسید برائے معائنہ پلنتھ لیول فارم

1. MOUنمبر
2. استفادہ کنندہ کا پورا نام
3. استفادہ کنندہ کا قومی شناختی کارڈ نمبر
4. اے ائی ٹیم کا نمبر

تاریخ

دن مہینہ سال

اے ائی ٹیم کے دستخط

MOU Number

Date DD MM YYYY

Earthquake Reconstruction and Rehabilitation Authority

Please
- Use Black Ballpoint
- Use English Block Letters
- Write One Letter in One Box

Plinth Level Inspection Certificate and Recommendation for Payment (for Timber Houses)

A - Particulars of the Owner of the House

1. **Mr./Ms./Mrs.** (With whom MOU Signed)
2. **W/o, D/o, S/o.**
3. **CNIC/ NIC.**

B - Checklist for the Assistance Inspection (AI) Team

4. Type of Construction — Stone Masonry / Concrete / Other (Please Specify)
5. Percent Of Recycled Material Used — Stone / Concrete / Timber / Other (Please Specify)
6. Info of the Builder: — Self Builder / Skilled Mason / Unskilled Labor
7. Plinth Area Constructed — Sq. Ft
8. Maximum Room Size — Ft x Ft

C - Training

9. Has the Owner received an awareness briefing in seismic resistant construction? Yes No
   A. From Whom: PO / VRC / Others
10. Has the builder received specific training in seismic resistant construction? Yes No
   B. From Whom: VRC / PO / HRC
11. Has the Beneficiary used ERRA's Structural Designs & Construction Guidlines? Yes No
   A. If not indicate source used — Self Design / Others

PO: Partner Organization; VRC: Village Reconstruction Committee; HRC: Housing Reconstruction Centre; VIL: Village

D - Spot Checks AI Team

Mode of Checking Assessment (Verification Questions from the beneficiary / spot checks)

** S: Satisfactory* ** U: Unsatisfactory*

12. Is the house reconstructed on a non-hazardous site? Yes No
13. Are the walls of house at reasonable distance form side slopes/Cliff. Yes No
14. Depth of Foundation from Ground: Inch
15. Width of Foundation: Inch — S U
16. Type of Mortar — If Cement & Sand Specify Ratio: Cement / Sand — S U
17. Size of the Timber Base Plate: In x In — S U
18. Method Used for Fixing Base Plate with Footing
   A. Threaded "J" or "L"shaped Anchor Bolts — Yes No
   - Diameter of Bolt — Inch — S U
   - Depth of Embedment — Inch — S U
   - C/C distance between Adjacent Botls — Inch — S U
   - Is the steel plate provided between washer & Timber — Yes No — S U

   B. "U" Shaped Steel Straps — Yes No
   - Width of Steel Strap — Inch — S U
   - Thickness of Steel Strap — Inch — S U
   - Is there any gap between steel strap — Yes No — S U

   C. Any Other Method (Please Specify)

Form Designed By NADRA

E - Certification by AI Team

19. Certified as built, subject to the following stated minor improvements (if any required)

Not Certified, Needs significant additional work to meet seismic guidelines and standards as listed below, This has been explained to the owner. Must resubmit requests for beneficiary inspection on completion.
(Provide guidance notes/ Sketches and leave a copy with owner)

F - Recommendation for Timber

20. Is 60 c.ft timber already available on site for construction of the house ? Yes No
21. Has the beneficiary already taken a permit under the guzara forest rules ? Yes No
22. Additional timber from Govt. Depot. — Required / Not Required

G - Recommendation for Payments by AI Team

23. The third instalment of Rs. 25000 from the Housing reconstruction Subsidy be — Released / Not Released

Army Representative — Beneficiary — Government Representative

H - رسید برائے معائنہ پلنتھ لیول فارم (ٹمبر)

1. MOU نمبر
2. استفادہ کنندہ کا پورا نام
3. استفادہ کنندہ کا قومی شناختی کارڈ نمبر
4. استفادہ کنندہ کو گورنمنٹ ڈپو سے لکڑی فراہم کی جائے / نہ کی جائے

تاریخ
دن مہینہ سال

اے آئی ٹیم کے دستخط

MOU Number

Date DD MM YYYY

ERRA

Earthquake Reconstruction and Rehabilitation Authority

Please
- Use Black Ballpoint
- Use English Block Letters
- Write One Letter in One Box

Plinth Level Inspection Certificate and Recommendation for Payment (Confined Masonry)

A - Particulars of the Owner of the House

1. Mr./Ms./Mrs. (With whom MOU Signed)
2. W/o, D/o, S/o.
3. CNIC/ NIC.

B - Checklist for the Assistance Inspection (AI) Team

4. Type of Masonry Unit — Brick / Block / Other (Please Specify)
5. Percent Of Recycled Material Used — Brick / Block / Other (Please Specify)
6. Info of the Builder: — Self Builder / Skilled Mason / Unskilled Labor
7. Plinth Area Constructed — Sq. Ft
8. Maximum Room Size — Ft x Ft

C - Training

9. Has the Owner received an awareness briefing in seismic resistant construction? Yes No
   A. From Where: PO / VRC / Others
10. Has the builder received specific training in seismic resistant construction? Yes No
   B. From Where: VRC / PO / HRC
11. Has the Beneficiary used ERRA's Structural Designs & Construction Guidelines? Yes No
   A. If not indicate source used: Self Design / Others

PO: Partner Organization; VRC: Village Reconstruction Committee; HRC: Housing Reconstruction Centre; VIL: Village

D - Spot Checks AI Team

12. Check if beneficiary has obtained prior design approval from approving authority? Yes No
13. Is the house reconstructed on a non-hazardous site? Yes No
14. Is any wall of the house supporting slopes? Yes No
15. Type of Foundation. i) Reinforced cement (R.C.C) strip footing ii) Insitu
16. Depth of Foundation from Ground: Inch
17. Width of Footing Inch i) Thickness of footing (R.C.C Strip) Inch ii) Thickness of insitu equal to depth of footing? Yes No
18. a) Concrete mix ratio R.C.C strip — Cement / Sand / Crush
    b) Insitu mix ratio — Cement / Sand / Gravel (Crush)
19. Reinforcement in footing: (Only for R.C.C Strip)
    i) Shorter Direction — Size of bar / Spacing of bar / Inch
    ii) Longer Direction — Size of bar / Spacing of bar / Inch
20. Does columns reinforcement start from foundation Yes No
21. Reinforcement in Column:
    i) Longitudinal reinforcement:-
    Size of bars — Number
    ii) Ties:-
    Size of tie — Spacing — Inch
22. Size of Column — Width — Inch x Depth — Inch
23. Lap length in reinforcing bars (If required) Inch
24. Size of Plinth Beam — Inch x — Inch
25. Reinforcement in plinth beam:
    i) Longitudinal reinforcement — Size / Number
    ii) Stirrups — Size / Spacing
26. Are columns placed at all corners and T junctions Yes No
27. Has the owner left the column dowels of sufficient length of lap with new bars Yes No

Form Designed By NARMA

E - Certification by AI Team

28. Certified as built, subject to the following stated minor improvements (If any required)
29. Not Certified, Needs significant additional work to meet seismic guidelines and standards as listed below. This has been explained to the owner. Must resubmit requests for beneficiary inspection on completion.
    (Provide guidance notes/ Sketches and leave a copy with owner)

F - Recommendation for Payments by AI Team

30. The third instalment of Rs. 25000 from the Housing reconstruction Subsidy be — Released / Not Released

Army Representative — Beneficiary — Government Representative

G - [illegible]

1. MOU نمبر
2. [illegible]
3. [illegible] نمبر
4. [illegible]

تاریخ

دن مہینہ سال

ERRA

Earthquake Reconstruction and Rehabilitation Authority

MOU Number

Please
- Use Black Ballpoint
- Use English Block Letters
- Write One Letter in One Box

Date DD MM YYYY

Earthquake Reconstruction and Rehabilitation Authority (ERRA) - Housing

A - Lintel Level Inspection Certificate and Recommendation for Payment

1. Mr. /Ms./Mrs. (With whom MOU Signed)
2. W/o, D/o, S/o.
3. CNIC/ NIC.

B - Training

4. Has the builder received specific training in seismic resistant construction? Yes ☐ No ☐

   A. Form Whom: PO ☐ VRC ☐ HRC ☐

5. Has the Beneficiary used ERRS's Structure Designs & Construction Guidelines? Yes ☐ No ☐

   A. If not source used Self Design ☐ Others ☐

PO: Partner Organization; VRC: Village Reconstruction Committee: HRC: Housing Reconstruction Centre; VIL: Village

C - Spot check by AI Team

Mode of Checking Assesment (verification on Questions from the beneficiary / spot check)

6. Check if beneficiary has complained with inputs suggested at plinth level inspection.	YES ☐	No ☐
7. Use of acceptable masonry units (e.g. dressed or semi-dressed stone) Bricks and Blocks.	S ☐	U ☐
8. Use of acceptable type of bond.	S ☐	U ☐
9. Use of Appropriate Wall Thickness (Visual / Empirical Checks)	S ☐	U ☐
10. Use of Specified Mortar (Visual / Empirical Checks) If used Y / N, If "Y", then.	S ☐	U ☐
11 Use of Through-stone for stone masonry (size/horizontal and vertical spacing) Visual/Empirical Check If use Y / N	YES ☐	No ☐
12. Use of Specified corner Blocks in case of Block masonry	S ☐	U ☐
13. Location and Size of Windows (Visual / Empirical Checks)	S ☐	U ☐
14. Use of typical horizontal reinforcement bands in wall (spacing/ # and size of bars/anchorage detail) Visual/Empirical checks-If used Y / N - If "Y" then.	S ☐	U ☐
15. Use of continuous RCC lintel band? (size/concreate ratio/# and size of main bars/ size and spacing of ties)	YES ☐	No ☐
16. If use of specified vertical bars adjacent to doors and windows.	YES ☐	No ☐
17. Use of specified vertical bars in walls (location/bar size/spacing/anchorage into intel	S ☐	U ☐
18. Use of specified inserts/anchors to receive roof framing.	YES ☐	No ☐
19. Discuss proposed roof a system with owner/builder to ensure adequate understanding of standard/guidelines; Planned roof system complies with Standing/guidelines.	YES ☐	No ☐
20. Has the beneficiary done the needful in respect of the previous checklist from the plinth level inspection?	YES ☐	No ☐

** S: Satisfactory * U: Unsatisfactory*

D - Certification by AI Team

21. Certified as built, subject to the following stated minor improvements (if any required) ☐

Not Certified, Needs significant additional work to meet seismic guidelines and standards as listed below, This has been explained to the owner, Must resubmit requests for beneficiary inspection on completion ☐

(Provide guidance notes/ Sketches and leave a copy with owner)

E - Recommendation for Payments by AI Team

22. It is recommended / Not recommended that the 4th instalment of Rs. 50,000 from the Housing Reconstruction Grant be released / Not released to the owner of the house/household identified above

Released ☐ Not Released ☐

Army Representative

Beneficiary

Government Representative

F - رسید برائے معائنہ انتھل لیول فارم

1. MOU نمبر
2. استفادہ کنندہ کا پورا نام
3. استفادہ کنندہ کا قومی شناختی کارڈ نمبر
4. اے آئی ٹیم کا نمبر

تاریخ

دن مہینہ سال

اے آئی ٹیم کے دستخط

MOU Number

Date DD MM YYYY

Earthquake Reconstruction and Rehabilitation Authority

Please
- Use Black Ballpoint
- Use English Block Letters
- Write One Letter in One Bo

Roof Band Level Inspection Certificate and Recommendation for Payment (for Timber House

A - Particulars of the Owner of the House

1. **Mr./Ms./Mrs.** (With whom MOU Signed)
2. W/o, D/o, S/o.
3. CNIC/ NIC.

B - Checklist for the Assistance Inspection (AI) Team

4. Percent of Recycled Material Used — Timber — Other (Please Specify)
5. Info. of the Builder — Self Builder — Skilled Masor — Unskilled Labor
6. Plinth Area Constructed — Sq. Ft
7. Maximum Room Size — Sq. Ft

C - Training

8. Has the Owner received an awareness briefing in seismic resistant construction? Yes No
   A. From Whom: PO VRC Others
9. Has the Owner/builder received specific training in seismic resistant construction? Yes No
   B. From Whom: PO VRC Others
10. Has the Beneficiary used ERRA's Structural Designs & Construction Guidlines? Yes No
    C. If not indicate source used — Self Design — Others

PO: Partner Organization; VRC: Village Reconstruction Committee; HRC: Housing Reconstruction Centre; VIL: Village

D - Spot Checks AI Team

Mode of Checking Assessment (Verification Questions from the beneficiary / spot checks)

** S: Satisfactory* ** U: Unsatisfact*

11. Is the house reconstructed on a non-hazardous site? Yes No
12. Are the walls of house at reasonable distance form side slopes/Cliff. Yes No
13. Size of Posts — In x In
14. Spacing of Posts — Ft — S U
15. Horizontal and vertical alignment of Posts — S U
16. Size of cross bracings a. Main — In x In; b. Secondary — In x In — S U
17. Quality of connection with: a. Members — In x In; b. Base Plate S U; c. Top Plate S U
18. Size of top plates — In x In — S U
19. Quality of infill material — S U
20. Quality of other Materials used — S U
21. Type of cladding used
22. Quality of cladding — S U
23. Size of opening S U
24. Location of openings — S U

Form Designed By NADRA

E - Certification by AI Team

25. Certified as built, subject to the following stated minor improvements (if any required)

Not Certified, Needs significant additional work to meet seismic guidelines and standards as listed below, This has been explained to the owner. Must resubmit requ for beneficiary inspection on completion.
(Provide guidance notes/ Sketches and leave a copy with owner)

F - Recommendation for Payments by AI Team

26. The third instalment of Rs. 50000 from the Housing reconstruction Subsidy be — Released — Not Released

Army Representative — Beneficiary — Government Representative

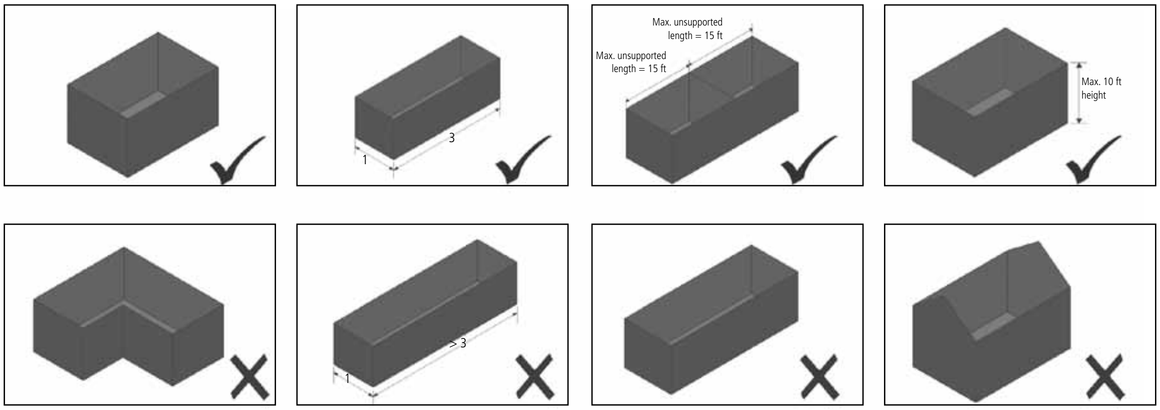
G – رسید برائے معائنہ روف بینڈ لیول فارم (ٹمبر)

MOUنمبر — 2. استفادہ کنندہ کا پورا نام

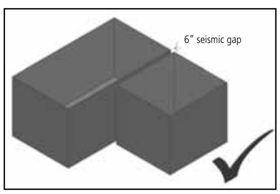
استفادہ کنندہ کا قومی شناختی کارڈ نمبر — تاریخ

Shape

The shape of the house affects how it behaves in earthquakes.
Eccentric shapes and unrestrained walls increase the stress on parts of the building.
Plan to reduce the stress and distribute forces evenly.



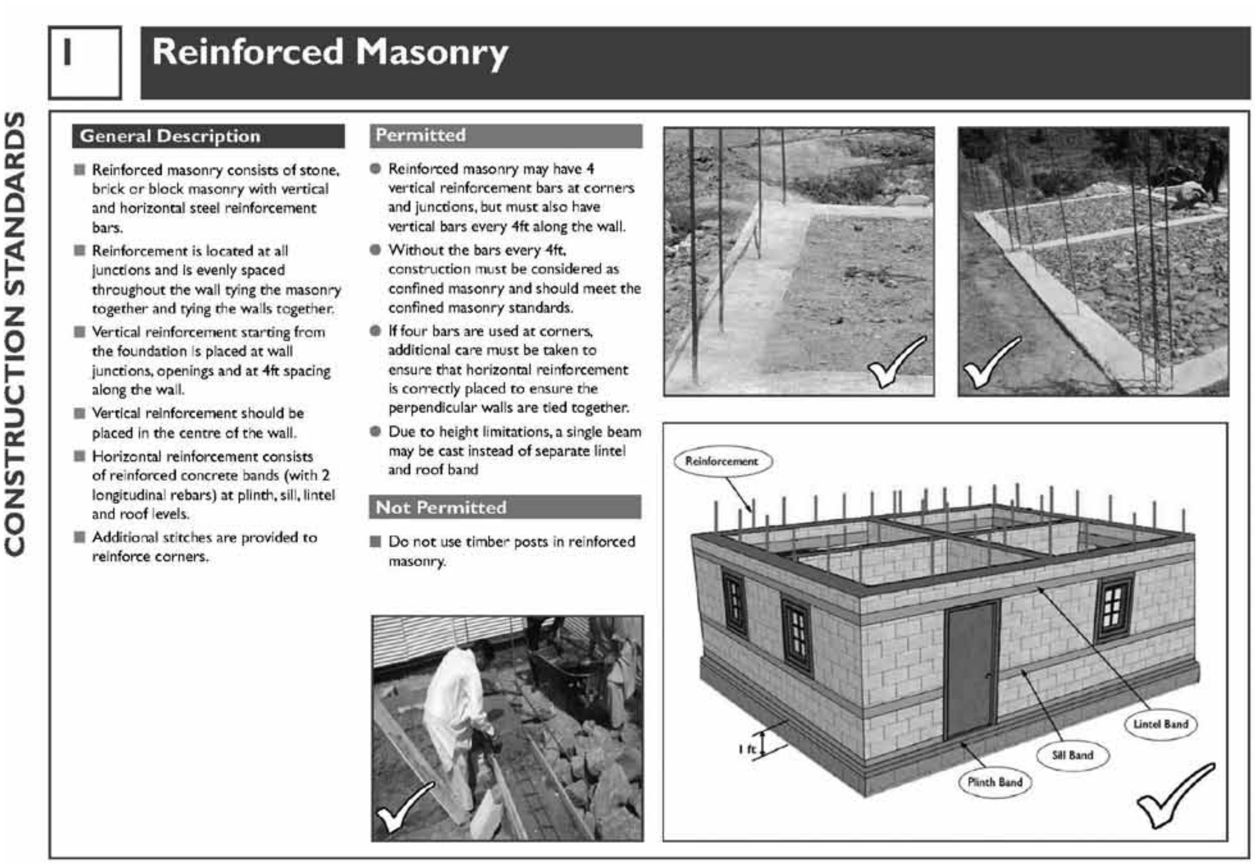
Shape
Construct regular simple shapes (e.g. rectangular; square).
Avoid L-shape, U-shape or more complex shapes.



Proportion
Construct regular simple Avoid long and narrow shapes.
The length of the house should not be more than 3 times the width.

Cross walls
Provide cross walls to strengthen the building.
Make sure all walls are connected to each other.
Maximum reem size should be 15ft x 15ft.
EXCEPTION
Room size up to 16 x 16 is acceptable if all other requirements are fulfilled.

Height
Maintain equal wall heights for all the walls.
Avoid gable walls.
Limit all buildings to one storey in high risk areas.


CONSTRUCTION STANDARDS

I **Reinforced Masonry**

General Description

- Reinforced masonry consists of stone, brick or block masonry with vertical and horizontal steel reinforcement bars.
- Reinforcement is located at all junctions and is evenly spaced throughout the wall tying the masonry together and tying the walls together.
- Vertical reinforcement starting from the foundation is placed at wall junctions, openings and at 4ft spacing along the wall.
- Vertical reinforcement should be placed in the centre of the wall.
- Horizontal reinforcement consists of reinforced concrete bands (with 2 longitudinal rebars) at plinth, sill, lintel and roof levels.
- Additional stitches are provided to reinforce corners.

Permitted

- Reinforced masonry may have 4 vertical reinforcement bars at corners and junctions, but must also have vertical bars every 4ft along the wall.
- Without the bars every 4ft, construction must be considered as confined masonry and should meet the confined masonry standards.
- If four bars are used at corners, additional care must be taken to ensure that horizontal reinforcement is correctly placed to ensure the perpendicular walls are tied together.
- Due to height limitations, a single beam may be cast instead of separate lintel and roof band

Not Permitted

- Do not use timber posts in reinforced masonry.

1 Reinforced Masonry | Specifications

Walls	**Wall Materials**	Stone, brick, concrete block, in situ concrete.	
	Wall Thickness (min.)	15"	Stone
		9"	Brick
		8"	Concrete Block
		8"	In Situ Concrete
	Wall Length	15 ft Maximum unsupported length	
Vertical	**Location**	Vertical reinforcement bars at corners, junctions, wall openings and at max. 5 feet spacing along walls	
	Reinforcement	1 # 4 or # 5 bar (brick or block) / 1 # 5 or # 6 bar (stone). (Reinforced concrete columns (with 4 bars) in corners are also acceptable if the vertical bars at max. 5 feet spacing along the wall are also used)	
Horizontal	**Foundation**	Material	Masonry
		Depth (below ground)	36" (soft soil) / 18" (hard soil)
		Height (above ground)	8" - 12"
		Width	30 inches
		Reinforcement	None
	Plinth Band	Depth	Min. 3"
		Reinforcement	2 # 4 bars (stirrups: #1 or #2 bars @ 6")
	Sill Band	Depth	Min. 3"
		Reinforcement	2 # 4 bars (stirrups: #1 or #2 bars @ 6")
	Lintel Band	Depth	Min. 3" (if <3 ft wide opening) OR Min. 6" (if >3 ft wide opening)
		Reinforcement	2 # 4 bars (stirrups: #1 #2 bars @ 6")
	Roof Band	Depth	Min. 3"
		Reinforcement	2 # 4 bars (stirrups: #1 or #2 bars @ 6")
	Corner strengthening	Location	Stitches @ 18" - 24" vertical spacing and embedded min. 2 ft into connecting walls
		Reinforcement	2 # 3 bars, (stirrups: #1 #2 bars @ 6") OR wire mesh
Roof		Lightweight (timber truss frame / steel frame with CGI sheet covers)	
Other Features		In case of stone masonry: provide through stones (Dosalu) at every 4 ft spacing vertically and 2 ft spacing horizontal ly	

CONSTRUCTION STANDARDS

2 Confined Masonry

CONSTRUCTION STANDARDS

General Description

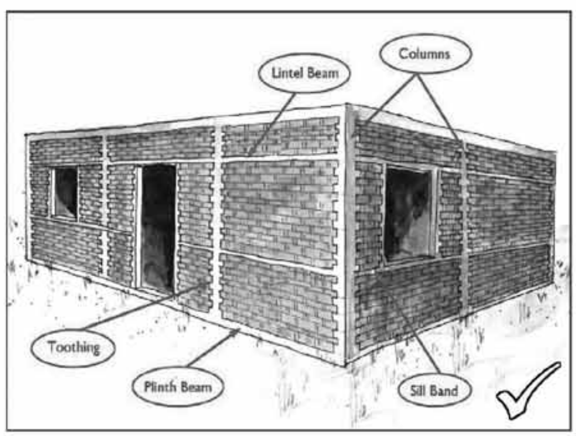
- Confined masonry consists of load bearing brick, or block masonry or in situ concrete panels surrounded by horizontal and vertical 'confining' elements made from reinforced concrete.
- Wall panels are built first, and then the reinforced concrete columns poured afterwards. The wall should be built with toothing to ensure a good connection with the concrete column. Walls should also be tied to columns with horizontal reinforcement.
- Horizontal reinforcement consists of reinforced concrete beams (with 4 longitudinal rebars) at plinth, lintel and roof levels. Additional reinforcement may be provided at sill level or with corner stitches.
- Vertical reinforcement consists of reinforced concrete columns (with 4 longitudinal rebars) at wall junctions (corners) and max. 15 ft spacing.
- Reinforced concrete frames (with 2 rebars) should be provided around window and door openings.

Permitted

- Masonry with 4 bar vertical reinforcement at corners and junctions and vertical bars at every 4 ft along the wall, can comply with reinforced masonry standards.
- Without vertical bars every 4 ft, construction must be considered to be confined masonry and meet the confined masonry standards.
- Due to height limitations, a single beam may be cast instead of separate lintel and roof beam.

Not Permitted

- Do not use timber posts with concrete blocks or in situ concrete.



2 Confined Masonry | Specifications

Walls	**Wall Materials**	Brick, concrete block, in situ concrete.	
	Wall Thickness (min.)	9" Brick 8" Concrete Block 8" In Situ Concrete	
	Wall Length	15 ft maximum unsupported length	
Vertical	**Location**	Reinforced concrete columns at wall junctions / corners Reinforced concrete frames around wall openings.	
	Reinforcement	Junctions: 4 # 4 bars (stirrups: #3 bars @ 6") Openings: 2 # 3 bars (stirrups: #3 bars @ 6")	
Horizontal	**Foundation**	Material	Masonry / Concrete
		Depth (below ground)	36" (soft soil) / 18" (hard soil)
		Height (above ground)	9"
		Width	24" - 30"
		Reinforcement	#3 bars @ 8" spacing (longer direction); #3 bars @6" spacing (shorter direction) Or 32" wide strap foundation is also acceptable
	Plinth Beam	Depth	Min. 9"
		Reinforcement	4 # 4 bars (stirrups: #3 bars @ 6")
	Sill Beam (Optional)	Depth	Min. 3"
		Reinforcement	2 # 3 bars (stirrups: #3 bars @ 6")
	Lintel Beam	Depth	Min. 6"
		Reinforcement	4 # 3 bars (stirrups: #3 bars @ 6")
	Roof Beam	Depth	Min. 9"
		Reinforcement	For <12 ft span: 4 #4 bars (stirrups: #3 bars @ 6") For >12 ft span: 4 #6 bars (stirrups: #3 bars @ 6")
	Corner strengthening	Location	Stitches @ 18" - 24" vertical spacing and embedded min. 2 ft into all connecting walls
		Reinforcement	2 # 3 bars; stirrups #1 bars @ 6" OR wire mesh
Roof		Lightweight (wooden truss frame / steel frame with CGI sheet covers)	
Other Features		In case of situ concrete: provide additional #4 vertical bars at every 4 ft along the wall	

3 Timber Frame / Dhajji

General Description

- Two types of timber frame construction are considered compliant:
  a. Timber frame with sheeted cladding.
  b. Timber frame with infill masonry (Dhajji)
- The timber frame in both cases should be constructed as a well-connected box with adequate bracing in all directions for stiffness.
- The base plate and wall plate act as plinth and roof beams and should be continuous.
- The masonry infill provides additional compressive strength.
- The panels should be small and even-sized.
- The timber should be good quality, with joint connections.
- All timber should be well protected from moisture, especially from the ground.

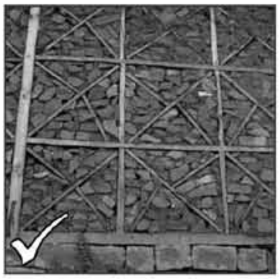
Permitted

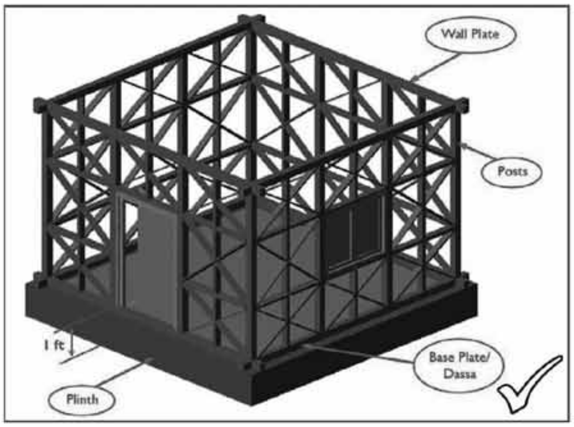
- Timber frame (Dhajji) construction is traditional in parts of the affected district. There are regional variations in the technique including different bracing patterns.
- The posts, sub posts and spacing should be considered to allow versions that provide equivalent structural strength: 4" x 4" at 4 ft spacing, equals to 4" x 2" at 2 ft spacing
- Bracing should be balanced in both directions, making small even-sized panels.

Not Permitted

- Do not use concrete blocks or in situ concrete as infill.
- Do not use large unbraced panels.
- Timber should not be in direct contact with the ground.

Apply termite proofing agents before using the timber in construction works.





3 Timber Frame / Dhajji | Specifications

CONSTRUCTION STANDARDS

Walls	**Wall materials**	Timber framework with cladding sheeted material, (CGI sheets or ply-wood) Timber framework with infill masonry (stone/ brick with mud or lime)	
	Wall thickness	Min. 4"	
	Unsupported wall length	Max. 15 ft	
	Wall height	Max. 8 ft	
Timber Structure	**General**	Use good quality, well-seasoned wood (e.g. Kail, Chir)	
	Base plate / 'dasa' (horizontal)	4" x 4" Beam minimum	
	Main posts (vertical)	4" x 4" Posts @ 4-6 ft spacing Or equivalent (e.g.: 4" x 2" @ 2 ft spacing)	
	Top wall plate (horizontal)	4" x 4" Wall plate continuous + connected to posts	
	Cross bracing (diagonal)	4" x 2" Bracing for > 2 ft spacing. Brace in both directions 4" x 1" Bracing for < 2 ft spacing. Brace in both directions	
Foundation and Plinth	**Foundation**	Material	Concrete or stone masonry
		Depth Below Ground	30" (soft soil) / 18" (hard soil)
		Width	24" - 30"
	Plinth beam	Location	Min. 12" above ground level. Base plate / 'dasa' acts as plinth beam.
			Additional concrete DPC / plinth beam optional.
			Base plate fixed to foundations with anchor bolts / metal straps at 6 ft spacing
Roof		Lightweight (wooden truss frame / steel frame with CGI sheet covers)	
Other Features	**Connections**	Strong connections are critical for strength	
	Infill	Infill should not have stones larger than 4" x 4"	
	Plaster	Mud plaster with or without straws	

Step-by-step Procedure

REMEDIAL MEASURES

Prop the roof properly and dismantle the foundation in arch

Remove the masonry in toothing pattern

Chisel the existing plinth beam/band without destroying the existing reinforcement

Dismental the foundation 18" on both sides of the column

Clean the surface of the P.C.C. and place #3 bars @ 8" pacing on both ways in the form of mesh over P.C.C. surface

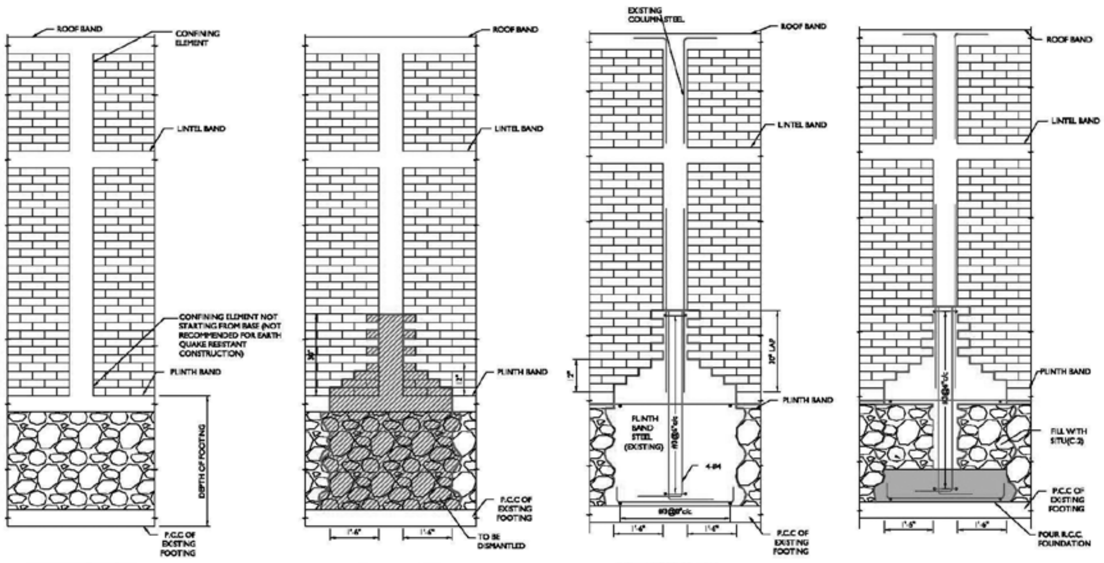
Extend column reinforcement with proper lap and proper foot to reinforcement pad in foundation

Place shuttering for plinth for pouring concrete

Pour 1:2:4 concrete in the foundation trench and the plinth band/beam

Pour 1:2:4 concrete in the columns with proper compaction

Improving anchorage



WALL ELEVATION ACTUAL CONDITION (STEP 1A)

WALL ELEVATION PORTION TO BE DISMANTLED (STEP 2 A)

WALL ELEVATION REINFORCEMENT DETAIL (STEP 3A)

ELEVATION OF WALL CONCRETING SEQUENCE (STEP 4A)

Improving anchorage: Extending reinforcement to foundation

Construction Types

- Confined Masonry

Reason

- Confined masonry houses in which vertical confining elements are not anchored to the foundation may slide (shear) or overturn at ground floor level under lateral loads generated during an earthquake.

Problem

- Lack of proper anchorage of vertical confining elements

Solution

- Extend the vertical confining elements to the foundation.

Methodology

- Support the roof with temporary timber props in the area around the confining column to be treated/extended.
- Remove the brick/block upto 3 ft height above plinth in arching/ toothing pattern in a manner that 18" at the top and 30" at the bottom. on both sides. Remove the concrete of the column (using a chisel) up to the same level.
- Remove the masonry/concrete down to the base of the foundation 18" on each side of the column. Do not remove the P.C.C. at the base of the foundation.
- Clean the surface of the existing P.C.C. and place footing reinforcement (using #3 bars at 8" spacing in both directions). Place new vertical column reinforcement (four #4 bars with #3 stirrups at 6" spacing), over the footing reinforcement and lap it with the existing reinforcement.
- Place 12" deep concrete in the foundation.
- Lay masonry (or situ concrete) above the footing up to plinth level, leaving an 8" wide toothed gap around the column reinforcement.
- Pour concrete in the column up to plinth level. (If required, erect shuttering around the column reinforcement.)
- Erect shuttering around the dismantled portion of plinth beam, and pour concrete.
- Re-lay the dismantled portion of masonry, leaving a toothed gap on each side of the column reinforcement.
- Pour concrete in the column. For the top 6" of the new portion of the column, use a comparatively dry mix and pack it tightly under the existing concrete.
- Repeat procedure for each column, as required.
- Cure concrete for at least 10 days.

Precautions:

- During toothing make sure that blocks or bricks are not damaged. Provide additional support to the walls, as required.
- Wear safety goggles during chiselling. Take care not to damage existing reinforcement bars.
- Use 1:2:4 (cement: sand: crush) concrete mix Maximum aggregate size shall be 1/2" and water-cement ratio shall be 0.6 (i.e. 30 litre water in one cement bag). Properly compact the concrete while pouring

A massive billboard overlooking a crowded urban transport hub.

Chapter 8
Public Information Campaigns

Why Needed?

The key to the success of any such program is the ability to understand the needs of its beneficiaries as well as for the beneficiaries to understand the program and how it operates, so that its impact and effectiveness is maximised. Having a good communications system in place right at the start, built into the reconstruction process as an integral component, will avoid many problems and ensure smooth implementation. Most importantly, an effective communications mechanism will help reduce rumours and misinformation – deliberate or accidental – that can often prove extremely detrimental to an otherwise well-designed and well-intentioned program.

Suggested Results Framework

Component: Public Information Campaign	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Development and dissemination of information materials for mass media to enhance Program knowledge and deliver key messages to beneficiaries and various stakeholders	Information seminars and events conducted on site in affected areas and displacement camps to spread Program basic information
	Information material and content developed for, and aired on, local radio channels in affected areas to spread Program information on basic as well as specific matters
	Information material and content developed for and presented in local print media to make specific announcements related to Program issues
	Localized traditional informal channels (mosques, markets, area notables, etc.) mobilized for spreading Program messages in affected areas
Development and dissemination of technical information materials for varied audiences and key stakeholders outlining technical standards on disaster-resistant construction	Technical information material on disaster-resistant construction using visual tools and in local languages developed and spread amongst key stakeholders such as POs, trainers, inspection/certification teams, construction workers, beneficiary households.
	Trainings provided to inspection/certification teams, PO staff and other stakeholders on use of technical information materials.

Achieving Program Results – The Pakistan Experience

A communication strategy needs to be designed to facilitate two-way communication and should be an integral component of the reconstruction process. The strategy has to be carefully designed, taking into account not just the language but also the culture and lifestyles of the communities.

In the Pakistan case, it is important to appreciate the scale of the Program and associated communications needs: the Program involved individual agreements with over 600,000 beneficiary families and implementation support from over 60,000 masons, carpenters and steel fixers as well as the support of 30 partner organisations and inspection teams with over 2,000 staff. All of these stakeholders were new to this kind of owner-driven Program, and new to hazard resistant construction.

On the level of affected households, the need for reliable information in the aftermath of a disaster cannot be over-stressed. People had experienced enormous loss, suffering and disruption to their lives. Uncertainty about their future was an additional burden and stress. In the absence of official information, the vacuum was filled by expectations, speculation and often misinformation.

With this in mind, the Program team developed a comprehensive public information campaign lasting the entire length of the Program that played a critical role in disseminating messages to a dispersed set of beneficiaries and key stakeholders in communities.

Communication materials to deliver key messages

The Program established very strong systems of coordination including an emphatic restriction on the dissemination of information materials not authorized or approved by Program headquarters. To help avoid confusion and in adherence to the common plan, all partners respected this strategy.

Program introductory campaign

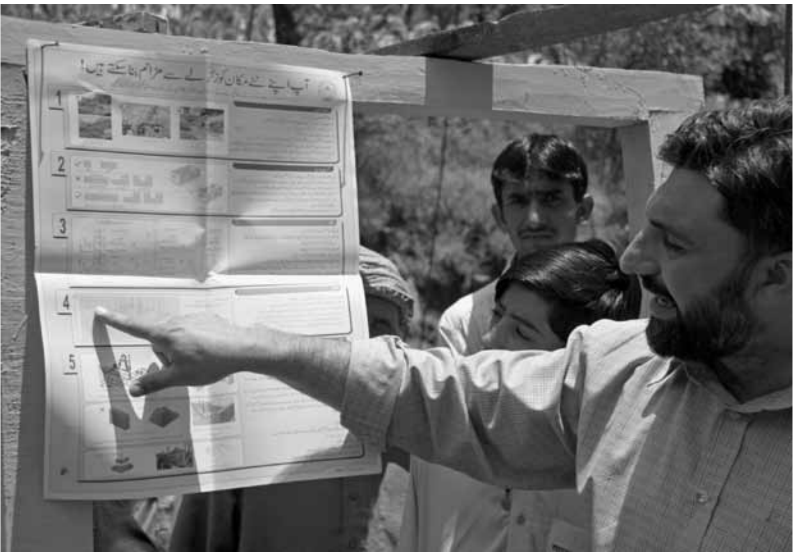
Since ERRA, the Program implementing agency at the federal level, was a new organization, it had to disseminate information about itself in order to build legitimacy. Furthermore, it needed to provide information on the Rural Housing Program to a widespread audience primarily including affected communities. The Program's mass information campaign for rural housing was outsourced to a professional communication company already engaged in other post-disaster sectors with ERRA. This ensured consistency with overall Agency identity and reconstruction strategies.

Mass media tools

Radio was the most broadly used media channel for the spread of key Program messages at various stages of implementation, especially in remote areas. Almost every village had radio coverage by a number of local stations. This assisted the Program to get messages directly into households, including to women and to those who did not have a high level of literacy. Radio could get messages disseminated very quickly, as compared to print and distribution. Radio was used in a number of ways:

- **Weekly Program**
  - Format of the show was infotainment
  - Specialized characters were created that became popular in the affected area
  - Produced by Program partners alongside local communications company
- **Public Service Announcements**
  - To disseminate concise messages as urgent updates or key awareness messages
  - Helped keep safety high on the agenda instead of simply a focus on financial assistance
- **Interview Programs**
  - Used by staff at district-level PO-run Housing Reconstruction Centers to discuss Program issues and answer queries.
- **Local announcements**
  - Trainings, public meetings and demonstration events

Print Media was very important in the communication strategy of the Program, to explain and promote a range of information to various target audiences accurately and authoritatively. This included information on formal Program documents such as beneficiary MOUs, posters, flyers, booklets and more substantial documents. Following the introductory campaign, the development of materials was carried out by the Program technical support partners.



Most print materials, especially those to be provided to the community or masons involved in construction, were created in the local language. Moreover, visual tools such as drawings and photographs were used extensively and were considered quite popular amongst the stakeholders. In fact, photographs of actual houses were considered more effective than technical drawings.

Television was used for announcements on news programs, including policy updates which needed to be disseminated quickly and authoritatively, and in current affairs and panel show programs discussing progress, challenges and again promoting policy updates. Television was not used for awareness promotion because of the limited funding for development of communications materials and the high cost of airtime on those television channels that were generally watched in affected areas.

Local and traditional channels of information, influence and communication were also used by the Program, including mosques and religious leaders, local politicians and government officials, market places, shopkeepers, building material merchants, schools and school teachers, public transport and transport terminals. These locations and actors played important roles in informing people of upcoming events such as training or inspection, new updates, or to promote and reinforce messages for safety.

Technical information materials

ERRA tasked its Implementation Partners such as UN-HABITAT, NSET (Nepal), and SDC with the production of technical and Program information materials and activities. Materials developed included:

- A '10 Point poster' summarizing approved seismic-resistant construction standards.
- Additional posters summarizing techniques of seismic-resistant construction based on the approved menu of methods and materials.
- Posters and booklets on remedial measures for retrofitting non-compliant construction.
- **Catalogue of Compliant Construction:** covering Program standards and technical guidance, this evolved incrementally and in different formats. It compiled and standardised all Program approved designs as a single master reference and resource document. (See chapter on Designing seismic-resistant construction standards.)

Training of field teams in using communications materials

Developing materials for homeowners would not be effective unless the technical and social mobilization staff were also fully educated. Keeping this in mind, basic training was provided to them in the use of information materials to ensure consistency of messages. These trainings were developed and delivered by Program technical partners at the HRCs in the early stages of the Program.

Lessons Learned – Considerations for Future Programs

Information gaps can risk Program success	In the absence of decisions on policies, procedures, and standards and their widespread communication, speculation, expectations, and misinformation abound. This has a negative impact on stakeholder relationships and reconstruction activity. Although ERRA policies were determined early on, their communication to the field was not as efficient as needed. It improved gradually as systems were strengthened. Also, it should be expected that people will go ahead with reconstruction with or without information. Hence key information needs to be issued as early as possible and reach as broadly as possible.
Information consistency is key	In most post-disaster scenarios there is a plethora of messages and information materials, often inconsistent or confusing for beneficiaries. ERRA avoided this risk by early policy development and coordination of stakeholders, and by emphatic ownership of the approval process for communication. This was supported by good cooperation from partners.
Retrieving messages already sent is very difficult	It is difficult to retrieve messages that have been disseminated. While strong measures for consistency were set in place, there was a chastising experience as well. In the first winter (2005/06) before the Housing policy was formalized, the Government of AJK issued reconstruction guidelines that came to be known as the 'yellow poster' (as they were set on yellow-colored paper). These guidelines were widely disseminated in some areas, and differed from ERRA-approved standards subsequently disseminated. The proliferation of these guidelines made it very difficult for ERRA partners to promote officially endorsed standards. However, this experience also convinced partners of the need to have one consistent centralized message flowing across to the affected communities.
Photographs rather than drawings	The strongest feedback from the communities was the preference for photographs of real buildings, instead of representational or engineering drawings for use in information materials on technical standards. This opinion was shared by homeowners, masons, and trainers.
Communicating construction standards requires hands-on training	It is difficult to explain technical information on topics such as seismic-resistant construction by radio or text alone. Step by step photographs, presentations, model construction, demonstrations (using buildings) and hands-on training are needed for people to see construction details practically, and to be able to replicate the advice accurately.

UN-HABITAT

ERRA HOUSING POLICY INTRODUCTION POSTER

ERRA

Victims were left uncertain as to how they could rebuild their houses.

Surveyor: "I am the ERRA surveyor for earthquake affected houses."

"Don't worry! Here's an MOU approving your house for reconstruction. Open a bank account so you can receive your installment of Rs. 75,000 that you are eligible for."

"The next step is to attend the ERRA workshops so you can build Earthquake resistant houses. You will learn Earthquake resistant techniques from experts at these workshops."

"You have reached the next step of your installment process by completing the foundation according to ERRA guidelines. After building your house till the plinth level…..

…….you need to go to the bank where you receive the next payment of Rs. 25,000."

Surveyor: "Now that you have completed your walls according to ERRA guidelines you can collect your final installment of Rs. 50,000 to complete your house."

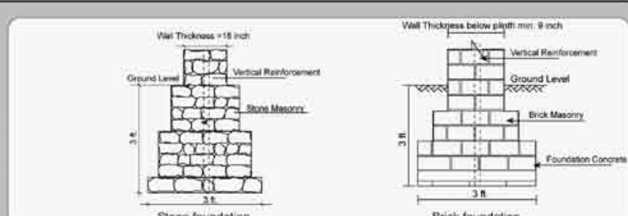
"This is an earthquake resistant home. Congratulations! You are a perfect example of how ERRA can help you move on by building back better!"

You can make your NEW HOUSE safer against EARTHQUAKE !

Follow 10 recommendations!

1 Foundation

- Depth and width: Depth and width of foundation should not be less than 1½ ft. in any case. Preferably, the width and height should be 3ft. wide and 3 ft. deep below ground level.
- Foundation structure: Foundation for stone wall and brick wall should be as shown in the picture
- Foundation band: A band in foundation as shown in section 2 is preferable

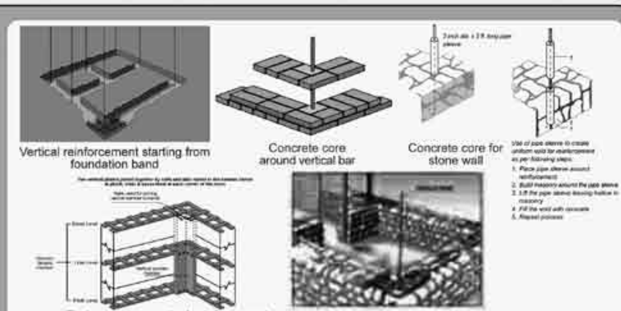


Stone foundation

Brick foundation

2 Vertical Reinforcement

- Vertical reinforcement (steel rebar) should be placed in the wall at all corners, junctions of walls and adjacent to all doors and windows
- All vertical reinforcements at corners and junctions should start from the foundation
- Vertical reinforcements adjacent to doors and windows can start from the plinth band (see section 3 below)
- Size of vertical reinforcements: for corners and junctions, provide at least ½ inch (4 sutar) dia. bar and for sides of openings – at least 3/8 inch (3 sutar) dia. bar.
- A concrete core of about 2 inch dia. should be provided around the reinforcement bar; in case of stone masonry a pipe casing as shown in the picture can be used for easy placement of concrete around vertical bars
- In case of mud mortar, timber posts or wooden planks can be used in place of reinforcement bars



Vertical reinforcement starting from foundation band

Concrete core around vertical bar

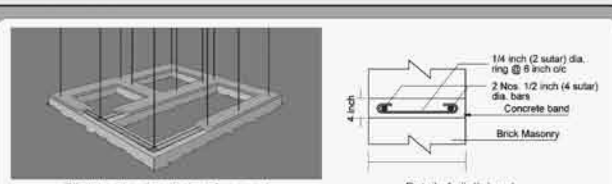
Concrete core for stone wall

Timber post as vertical reinforcement in mud mortar

Vertical reinforcement in stone wall

3 Plinth

- Plinth height: Plinth should be at least 1ft above the ground level
- Plinth band: A concrete band with reinforcement bars inside as shown in the picture should be provided
- Detail of band: Minimum thickness of plinth should not be less than 4 inch and width equal to wall thickness. A minimum 2 bars of ½ inch (4 sutar) dia. as main reinforcement and 1/4 inch (2 sutar) dia. rings @ 6 inch apart should be used.



Plinth band and vertical reinforcement

Detail of plinth band

4 Doors and Windows

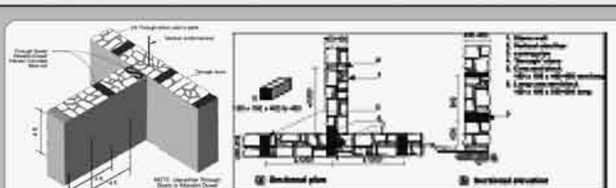
- Location of doors and windows: Doors and windows should be placed at least 2 ft. away from the wall corner.
- Total length of doors and windows: The cumulative length of doors and windows in a wall should not be more 50% of length of the wall.
- Gap between two openings: The wall distance between any two openings (doors and/or windows) should not be less than 2 ft.

Appropriate location of doors and windows

5 Walls

Stone Wall

- Wall Thickness: Thickness of walls should be equal to or more than 1½ ft.
- For stone-masonry, the inner and outer wythes of the wall should be interlocked with long stones; no large space between two wythes should be left for filling with pebbles or mortar. Avoid round and small pieces of stones.
- Through stones: 'Through' stones of full length equal to wall thickness should be used in every 2 ft. lift at not more than 4 ft. apart horizontally



Through stones in stone masonry wall

Brick Wall

- Wall thickness: Thickness of walls should be a minimum of 9 inch for 1 story house and 14 inch for 2 story buildings
- Laying of bricks: Bricks should be laid staggered so that the vertical joints don't form a continuous line. At corners or at wall-junctions, through vertical joints should be avoided by properly laying the bricks. Never make a vertical "teeth". See picture for proper brick laying at such strategic places.
- Stepped construction: Stepped wall construction is better than toothed when there is need for future extension or continuation of work

Stepped brick wall construction in place of toothed construction

View of stepped wall construction

Block Wall

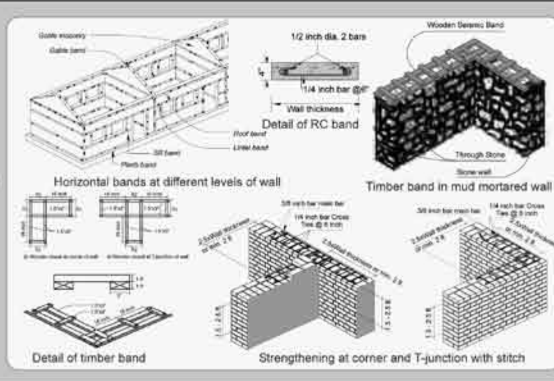
- Solid blocks are preferable as compared to hollow blocks
- Thickness of wall: Thickness of block wall should be 8 inch when solid blocks are used.
- Special corner blocks: Special corner blocks with openings at side are required for placing vertical reinforcements

Vertical reinforcement in block wall

Special corner block for placing vertical reinforcement

6 Bands and Corner Strengthening

- Horizontal bands: Horizontal bands should be provided throughout the entire wall at following locations:
  - DPC level (Plinth level) – Plinth band
  - Below window level (Sill level) – Sill band
  - Above door and window (Lintel level) – Lintel band
  - Roof (Eaves level) - Wall plate
  - Gable (Triangular gable wall) – Gable band
- Corner strengthening: If the vertical distance between two consecutive horizontal bands is more than 3 ft., all corners and T-junctions should be strengthened by using reinforced concrete stitches as shown in the picture
- Timber band and stitch: In case of mud mortar wall, timber can be used as horizontal band or stitch as shown in the figure



Horizontal bands at different levels of wall

Detail of RC band

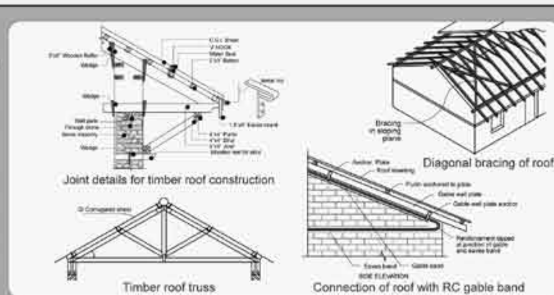
Timber band in mud mortared wall

Detail of timber band

Strengthening at corner and T-junction with stitch

7 Roof

- In case of CGI sheet roof, the timber beams or joists should be tied with wall plates with reinforcement bar, binding wire, bolts or with lashes
- Rafters should also be tied properly
- Timber members should be joined properly with appropriate joinery or with metal straps
- Diagonal bracing should also be done


Joint details for timber roof construction

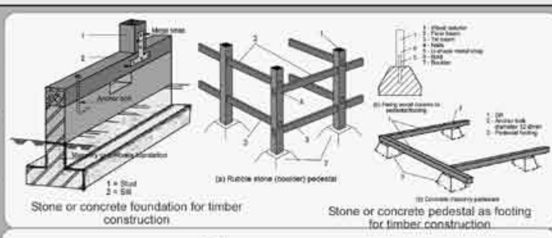
Diagonal bracing of roof

Timber roof truss

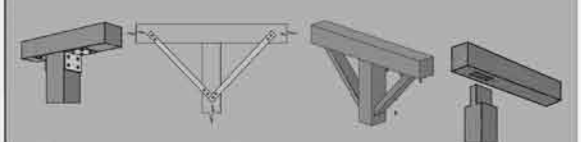
Connection of roof with RC gable band

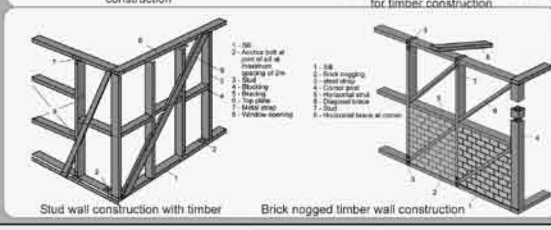
8 Timber Construction

- Foundation for timber construction: Timber posts or timber sill should be properly connected to the stone or concrete foundation as shown
- Stud wall construction (timber frame with plank or CGI or any other sheating): Timber frame should be properly joined together with proper timber connections and metal strap and should be braced diagonally
- Brick or stone nogged timber construction: In such construction also, the timber members should be properly joined and braced together
- Timber joints: Proper timber joints should be made by using different carpentry joints and by use of nails and metal straps


Stone or concrete foundation for timber construction

Stone or concrete pedestal as footing for timber construction


Typical timber joints


Stud wall construction with timber

Brick nogged timber wall construction

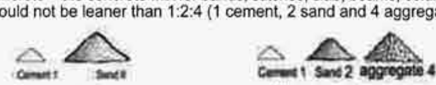
9 Number of Story in a House

- In mud mortar, no house should be more than 1 story
- In cement mortar, house can be of 2 story

10 Good Quality Materials

- Brick – Well burnt, regular sized bricks should be used
- Stone – Dressed stones are preferable than rubbles and rounded stones
- Timber – well seasoned hard wood without knots should be used for structural members; timber treatment such as use of coal tar or any other preservative can prevent timbers from being decayed and attacked by insects

- Mortar – cement mortar should not be leaner than 1:6 (1 cement and 6 sand); preferably it should be 1:4 (1 cement and 4 sand)
- Concrete – the concrete mix for bands, stitches, slab, beams, columns should not be leaner than 1:2:4 (1 cement, 2 sand and 4 aggregate)



Mix proportion for mortar

Mix proportion for concrete

This publication has been prepared for assisting in rural reconstruction of earthquake affected areas and is believed to be helpful in assuring the enhanced earthquake safety of rural houses. This will provide easy and ready to use solutions for common rural houses. This construction checklist is for one or two storied rural housing units, the provisions mentioned here are only for such houses. If the house is other than this, standard provisions for those specific types should be followed. For further details related to the provisions mentioned in this checklist, detail guidelines can be followed.

This publication has been prepared for Earthquake Reconstruction and Rehabilitation Authority (ERRA) of Pakistan by UN Human Settlements Programme (UN Habitat) with the technical support from National Society for Earthquake Technology - Nepal (NSET) and funding support from Canadian International Development Agency and the US Agency for International Development (USAID).

Remote communities had to summon all possible means to transport construction materials to building sites.

Chapter 9
Building Materials Supply Chain

Why Needed?

In a post-disaster context, construction activity can often increase substantially as affected communities begin to rebuild their lives and lost assets. While this is a testament to their resilience, it can also lead to a shortage, and a consequent price increase, of requisite building materials. For communities that are rural and/or remote, significant transportation costs can also be incurred as they begin their reconstruction activity. This leads to a decline in their purchasing power, especially in cases where a fixed, pre-determined cash grant is provided to them by an official reconstruction Program.

To account for this, it is important for any such Program to plan for a consistent and reasonably priced supply of required building materials. Programs that rely on introducing disaster-resistant techniques need to be especially careful because some of the materials used in approved disaster-resistant construction standards may not be easily available across the entire affected area.

Suggested Results Framework

Component: Building Materials Supply Chain and Hubs	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Availability of required quantities of building materials ensured across affected area within affordable price range.	% of affected area with operational building materials hubs 'x' months after Program launch Mechanism established to monitor prices of required building materials to report variances and inform interventions/actions

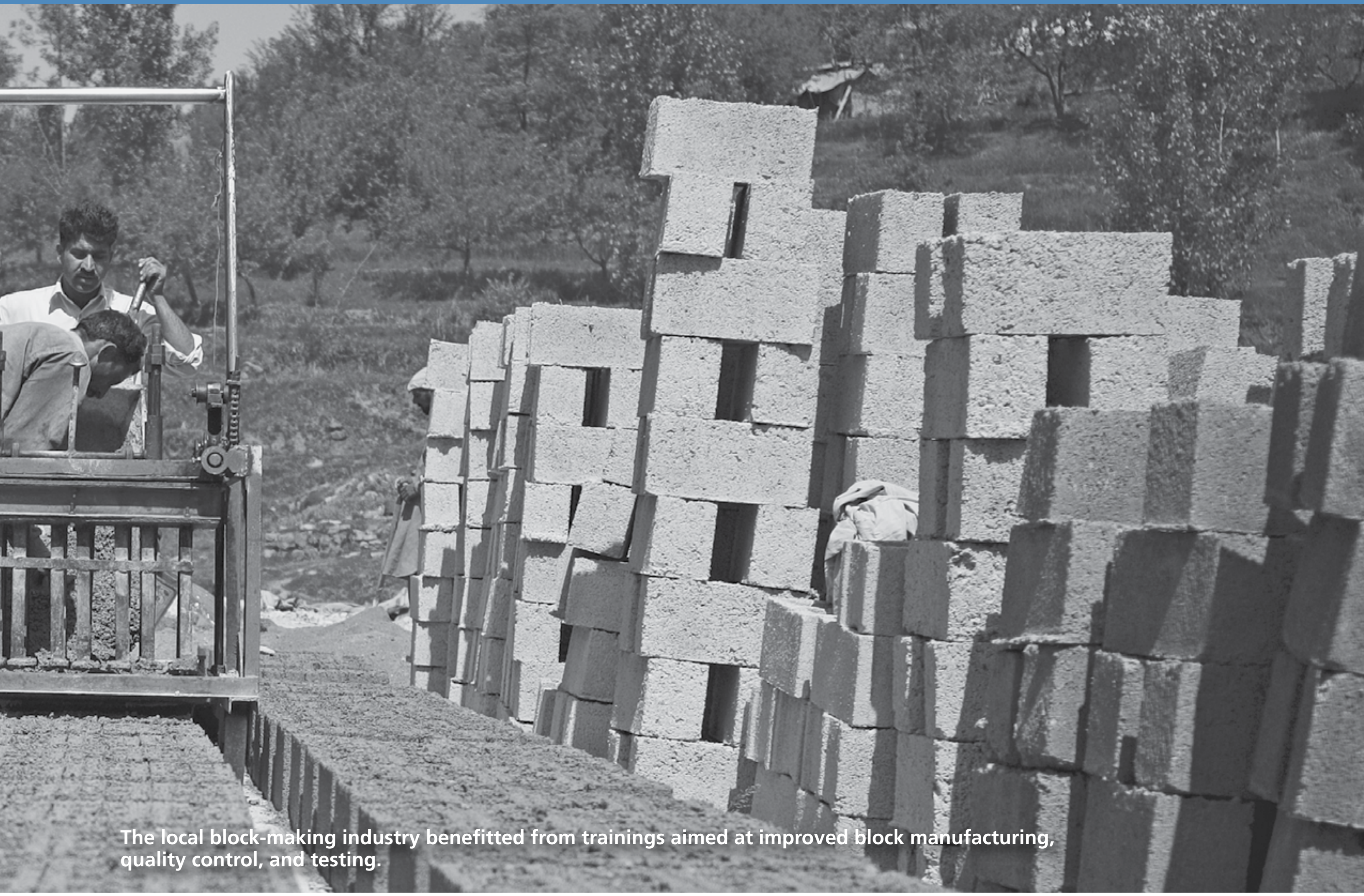
Achieving Program Results – The Pakistan Experience

In case of Pakistan, the vastness of the affected area and the extremely difficult topographical conditions posed an unprecedented challenge in the transportation of materials. This was borne by the affected communities as they managed procurement and carriage of materials for housing to the reconstruction sites. The widely dispersed settlement pattern in a hazardous and fragile environment represented further challenges to the sustainable provision of building materials.

To reduce this vulnerability, a network of private sector led building materials hubs was created to strengthen the supply chain of construction materials necessary in this massive reconstruction undertaking. Moreover, transporters were encouraged to provide logistical support in ensuring availability of requisite materials in ample quantities as reconstruction activity gained momentum. Within the first year, over 30 material hubs were established across the affected area to ensure access to key materials of Program-specified quality standards. The monitoring of quality of prescribed materials was carried out by ERRA's M&E teams.

Local governments were tasked with providing suitable sites for setting up local building material hubs. Their objective was to **support and strengthen existing private sector businesses** dealing in building materials instead of setting up a parallel system. Thus local businessmen already engaged in supply of building materials were asked to operate the materials hubs at given locations, to complement their existing businesses. Moreover, Partner Organizations (especially NGOs) active in **micro-credit** were encouraged to provide entrepreneurship training and funding to locals in the affected areas to set up shops in these hubs.

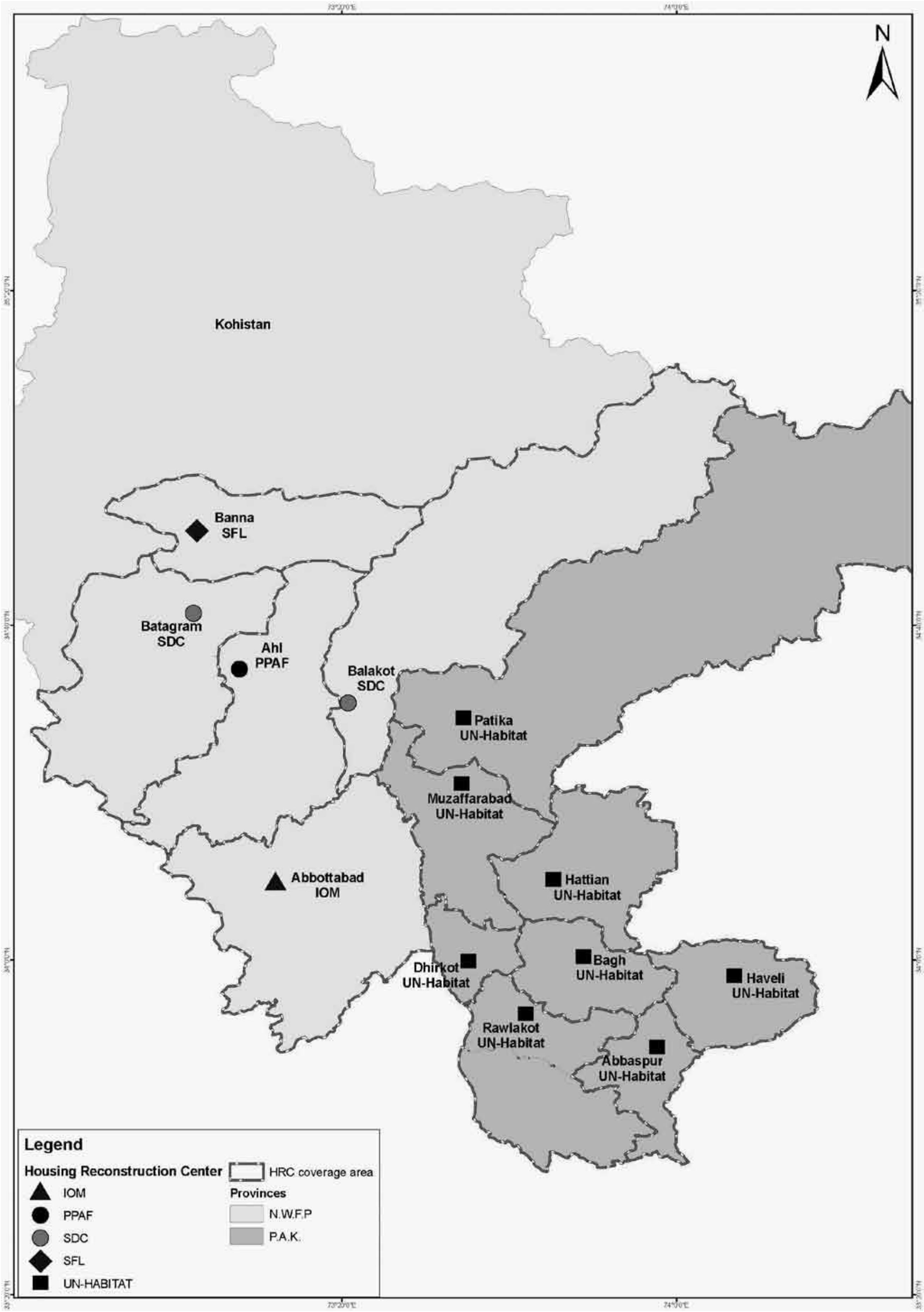
The **cost of various building materials** at these hubs was not centrally fixed, but related to local market rates to avoid distorting the local economy. Price differences across the affected area were considered acceptable and inevitable. The effort to increase supply was the main purpose of the strategy and was considered an adequate measure to mitigate against inflation.



The local block-making industry benefitted from trainings aimed at improved block manufacturing, quality control, and testing.

Lessons Learned – Considerations for Future Programs

Transport costs can erode real value of financial assistance; infrastructure deficit affects access to materials, labour, and increases costs of material.	Poor coverage and condition of roads in many affected areas significantly increased transportation costs and difficulties. Due to variation in local material costs plus the transportation factor, financial assistance was not worth the same to all households. This distorted the policy of equitable financial assistance.
Facilitating building materials sector can only partially mitigate issues of inflation and inequity.	Building material hubs contributed towards ensuring availability, quality, and consistency of pricing of key materials, particularly those imported to the earthquake area like steel and cement. But the distribution of hubs could not fully mitigate against the transportation costs for the most remote households.
Private sector-led materials hubs are often created only near existing markets.	The creation of building materials hubs did not resolve the problem of limited supply in secondary centres and remote areas. Hub operators concentrated where there was already a strong market.



District level Housing Reconstruction Centers were established and operated by various implementation partners.

Chapter 10
Partnerships for Coordinated Implementation

Why Needed?

The task of reconstruction after disasters, especially after those that are major, widespread, or affect a large number of people, cannot be managed by governments acting alone. An effective response requires collaboration at local, national, and international levels between the affected people and communities, government, non-government organisations, development partners, and specialized organisations.

In many instances a number of such actors and institutions will respond intuitively with help and assistance, even without any request from, or reference to, the government. While the government acting alone as well as non-government intervention will both be well meant, they can be more effective if such involvement is done in an orchestrated and coordinated manner, so that wherever possible the response is coherent and consistent, and conflicts and overlaps are minimised.

More importantly, if properly organised in the form of partnerships, the impact of the reconstruction effort can be deepened and its implementation hastened.

Suggested Results Framework

Component: Partnership Models for Coordinated Implementation	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Specialized skills and expertise of various partners utilized in all aspects and components of Program, from strategic underpinnings to design and field-level implementation	Program partnership base broadened and diversified to include local, national, and international stakeholders All Program partners agree to implement Program components (training, technical assistance, A&I etc.) according to same standards and guidelines using uniform Program objectives % of affected areas with field-level presence of Partner Organizations during entire length of the Program

Achieving Program Results – The Pakistan Experience

The Rural Housing Reconstruction Program needed to be implemented at a vast scale, with the already very limited capacity available in the government at various levels, further eroded by the disaster. It was therefore essential to harness all available and appropriate human, financial, and technical resources through partnerships for efficient and effective Program implementation. The Program was therefore required to manage partnerships as an imperative to handling reconstruction.

One of the key challenges in the Program was to ensure the provision of consistent technical assistance to all households to maximize the investment made by the government. Moreover, at the time of the earthquake, there was little capacity for earthquake-resistant construction in Pakistan especially in private housing. The lack of expertise and experience among national and international non-governmental organisations in seismic-resistant housing construction made it further difficult to identify suitable partners for the various stages of implementation.

Limited NGO capacity in housing sector

The Program strategy was designed on the basis of complete coverage of all affected areas by partner organisations providing technical support. In reality, there were insufficient NGOs willing or able to carry out this role. While a high proportion of NGOs was engaged in emergency shelter activities as part of the overall emergency response, relatively few were interested, experienced, or skilled to engage in housing reconstruction, and fewer still could take up a facilitating role in housing reconstruction.

Low funding for technical assistance hampering program

While the cost of operating as a partner organisation was relatively low and very cost effective compared to a direct implementation role, there was low interest or support from the donor community for a technical assistance role in housing. The reasons included lack of visibility, lack of donor experience in this area, lack of NGO experience, and high proportionate costs in personnel.

As a result funding for technical assistance, particularly allocations by implementing partners, was low at the outset and then committed in an incremental and unpredictable manner. The absence of predictable funding for an adequate duration was a severe constraint on PO mobilization; organizations engaged in technical assistance were unable to plan or implement strategically.

The shortfall in technical assistance funding for the first building season after the disaster meant that in many areas people started reconstruction without adequate access to Program information on standards, advice, or training. This resulted in a high proportion of non-compliant construction in the more remote areas. The situation improved when technical assistance was scaled up in the next year. The non-compliant houses had to be retro-fitted using Program guidelines on compliance and repairs.

Summary of Partnership Arrangements for Each Program Component

Table 7 sums up various partnership arrangements at different stages of the Rural Housing Reconstruction Program.

Table 7: RHRP Partnership Arrangements

Task / Component	Responsible Entity / Partner	Nature of Responsibility
Development of menu of Seismic-Resistant design solutions	■ World Bank ■ National Society of Earthquake Technology (NSET), Nepal ■ NESPAK ■ UN-HABITAT	Seismic-resistant structural design solutions developed, based on international best practices. Local technologies adapted, where found appropriate.
Detailed Damage Assessment and Beneficiary Eligibility Verification Survey	■ Pakistan Military with support from local governments and community representatives	Required massive logistical capacity which only the Military was able to provide in the vast mountainous affected areas. Completed in 4 months with carpet coverage, enabling creation of comprehensive beneficiary database.
Creation and Management of Beneficiary Database	■ National Database and Registration Authority (NADRA)	NADRA already had individual-level Computerised National Identity Card (CNIC) database from across the country. The beneficiary database developed after completion of the damage assessment survey was linked to this for beneficiary verification.
Opening of Beneficiary Bank Accounts across Affected Areas	■ State Bank of Pakistan (central bank) ■ Commercial Banks ■ Development Finance Institutions	ERRA requested the State Bank to relax account opening conditions for beneficiaries in affected areas. NADRA sent mobile teams across affected area to issue CNICs to beneficiaries to enable account opening Banks sent mobile teams across the affected area to open bank accounts in an expeditious manner
Development of Technical Training curricula on Seismic-Resistant reconstruction	■ NSET, Nepal	NSET-Nepal took the lead with its expertise and significant experience in training on seismic-resistant construction standards in mountainous areas, and familiarity with the South Asian context
Development of Community and Social Mobilization Training	■ Strengthening Participatory Organization (SPO) – local NGO ■ Network of Rural Support Programs – local NGOs	This was a continuous process throughout Program implementation. Training was provided to staff of Partner Organizations who worked in the field with communities on technical matters.

continues

Table 7: RHRP Partnership Arrangements (continuation)

Task / Component	Responsible Entity / Partner	Nature of Responsibility
Training of Master Trainers in Technical Issues	■ NSET, Nepal ■ Pakistan Military ■ UN-HABITAT	This was undertaken in phases during the first half of Program implementation. Master trainers included staff from Partner Organizations who in turn trained the HRC Trainers
Training of Craftsmen and Homeowners in Seismic-Resistant Reconstruction	Partner Organizations (POs) including: ■ Pakistan Military ■ PPAF ■ UN-HABITAT ■ Bilaterals ■ Local and International NGOs	This was a continuous process throughout Program implementation. Training included construction of demonstration houses and structural details and played a major role in ensuring the inculcation of seismic-resistant construction at field level. Outputs were fed into Training MIS monitored centrally at ERRA.
Assistance, Inspection, and Certification	■ Pakistan Military ■ PPAF ■ UN-HABITAT (in the last year of Program implementation)	This was a continuous process throughout Program implementation. It involved visiting each reconstruction site to inspect and certify seismic compliant construction up to a certain stage. Output was fed into Housing MIS monitored centrally at ERRA.
Development of Housing MIS and Financial MIS to monitor physical and financial progress, including seismic compliance	■ ERRA ■ NADRA	This was housed centrally at ERRA with access to stakeholders on demand. It was used to produce periodic reports for analysis and to monitor household-level activity
Management of District-level Housing Reconstruction Centres	■ PPAF ■ UN-HABITAT ■ SDC ■ GTZ	HRCs served as hubs for POs to conduct trainings on seismic compliant reconstruction; coordinate with all POs operating in the District, and monitor local level activity including market trends such as availability and prices of building materials.
Development of Compliance Catalogue to provide Guidance and Remedial Measures for Non-compliant Construction	ERRA with contributions from: ■ World Bank ■ PPAF ■ NESPAK ■ UN-HABITAT ■ SDC	The Compliance Catalogue consolidated the menu of construction standards approved at different times. It also provided possible remedial measures for retrofitting non-compliant construction

Lessons Learned – Considerations for Future Programs

Finding suitable partners to support housing reconstruction can be difficult	The original RHRP strategy relied on use of NGOs/CSOs to act as partner organizations and provide technical support for reconstruction. But there was a shortage of suitable NGOs to carry out this task.
Donor organizations can be less willing to fund technical assistance than housing reconstruction	Donors provided ready funds for the housing reconstruction grants, but proved less willing to fund technical assistance by partner organizations. What funding did come was incremental and unpredictable. The long-term impact of this was that some households commenced reconstruction without having received guidance on this, and had to subsequently undertake costly retrofitting to make their houses compliant with seismic-resistance standards.
Lead reconstruction agency should agree with partners on parameters of involvement; registration process for NGOs/CSOs; coordination mechanisms; reporting procedure; and monitoring benchmarks	ERRA was the focal agency for all stakeholders engaged in the housing reconstruction program. Everything was managed centrally through ERRA, thereby ensuring consistency in interventions and coordination of the overall reconstruction effort. ERRA developed systems in collaboration with partner organizations, affected communities and levels of government (as relevant) to manage these partnerships.
Local level hubs can facilitate coordination	Housing Reconstruction Centres served as places to conduct trainings, allow coordination, and nurture exchanges between partner organizations. AI hubs played a similar role in facilitating effective deployment of AI teams.

A social mobilizer training members of a Village Reconstruction Committee.

Chapter 11
Community and Social Mobilization

Why Needed?

It is now widely recognised that community participation is a necessary and integral component of development, and housing reconstruction after a disaster is no exception. Housing in particular relates to the community's needs and is about providing and securing private assets that will be used, managed, and maintained by the community with little or no long-term intervention by government.

Even in cases where a reconstruction program follows an owner-driven approach and puts individual households at the centre of reconstruction, strong and continuous community and social mobilization will be needed to harness the collective strengths of communities in understanding and propagating the program principles and ensuring sustainability of program objectives. This will be especially important for hazard-resistant construction, which may be a new tool being introduced to the communities, and thus requiring significant mobilization as well as training and capacity building.

It is thus critical that a reconstruction program systematically plans and implements strategies for community and social mobilization at the level of affected communities, even if the program benefits are individual household-focused, and the program itself homeowner-driven.

Suggested Results Framework

Component: Community and Social mobilization	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Institutionalization of community-based approaches towards implementing key Program aspects, through creation and capacity building of village-level committees	Social mobilization training for field-level staff of Partner Organizations developed and delivered centrally
	% of affected villages where Village Reconstruction Committees established with assistance from Partner Organizations
	Synergies developed with other Partner Organization community-level activities such as trainings on disaster-resistant reconstruction

Achieving Program Results – The Pakistan Experience

Institutionalization of community-driven approach

In the Pakistan earthquake experience, ERRA tasked Partner Organizations (which were also responsible for training and capacity building at field level on seismic-resistant reconstruction) with social mobilization activities in affected villages. These organizations, mainly local NGOs, often had prior experience with this nature of work and thus provided valuable expertise in community mobilization. The Program strategy provided consistent messages and outlined common outputs for social mobilization, leaving Partner Organizations to achieve them using their own best practices and approaches.

The nature and kinds of activities conducted for the purpose of social and community mobilization were as follows:

A community based promotional activity underway.

Development and delivery of initial training on social mobilization	■ Conducted by national-level NGO at Program commencement ■ Trained all social mobilization staff of institutional partners and POs based on Program strategy
Enhanced training for social mobilisation teams	■ Comprehensive training curricula, resources and reference materials were developed and delivered to all social mobilization staff of POs expanding on the range of topics and skills, and preparing them for a wider range of field activities. ■ Trainings developed and conducted by national-level NGO and the network of National Rural Support Programs
Village level mobilization – creation of Village Reconstruction Committees (VRCs)	■ Social mobilization teams engaged in formation of Village Reconstruction Committees (VRCs) and their training in all villages across affected districts ■ VRC responsibilities included: • Coordination with POs for communication of Program policies, standards, updates. • Organisation of community for orientation and briefing sessions • Identification of artisans and skilled labour, and support to organise practical training on safer construction • Coordination with AI teams for inspection, sharing of information on houses ready for inspection, and communication of visit timetables • Advice for grievance cases
Community based promotional activities	■ Technical support and awareness activities were organised at community level, including training and information sessions, demonstration and model buildings, remedial measure promotion, and other activities
Support for Assistance and Inspection/Certification regime, queries and grievance redress	■ Community organization and liaison helped to ensure planning and implementation of the Inspection regime was efficient, including: • compiling lists of houses ready for inspection • informing communities of inspection schedules • collecting, reporting, or answering queries and resolving grievance cases

Challenges in Social Mobilization

The Village Reconstruction Committees (VRCs) played a facilitation role but had no formal power or authority to influence households. This was because formal agreements in the Program were between the lead agency (ERRA, representing the government) and the homeowners as signatories of the MoUs, and thus the VRC had no *de jure* authority over them. This reduced the effectiveness and long term sustainability of VRCs, which in some cases only existed on paper. Moreover, in some earthquake affected areas pre-disaster social cohesion was weak, making it difficult to bring the community together for a shared purpose. Existing social hierarchies also came in the way of an equitable process.

Lessons Learned – Considerations for Future Programs

Social mobilization is critical to program success	Community participation was integral to RHRP, and hence considerable effort was put into social mobilization. Community involvement was promoted in relation to verification of beneficiaries; use of seismic-resistant construction techniques; resolution of disputes over land; support for vulnerable groups; etc.
Use of NGOs/CSOs engaged in training to carry out social mobilization as well can be effective	RHRP made use of partner organizations already engaged in provision of technical training to local artisans to carry out social mobilization activities. This streamlined interventions and enhanced efficiency and consistency of messages.
Training is required for social mobilization	A national level NGO provided the ‘top tier’ training in social mobilization. This then cascaded down through partner organizations to social mobilization teams on ground. Specific training curricula and materials were developed for the purpose.
Key messages should be consistent, but methods and approaches taken to social mobilization can be flexible	ERRA controlled the messages in all public information campaigns, including social mobilization. But partner organizations were given the flexibility to choose whichever mobilization methods and practices suited them best.
Incentives and authority influence the role different entities play in social mobilization	Village Reconstruction Committees were set up to support the housing reconstruction program, including organizing communities for briefings, inspection visits, and supporting training. However, unlike POs which had contractual obligations to ERRA to perform their assigned roles, the VRCs had no legal authority and thus had only limited effectiveness. Some only existed on paper.
Social cohesion cannot be assumed	In some areas there was little social cohesion among communities because of remote locations and dispersal over wide areas. A related challenge was posed by the existence of social hierarchies and, in some cases, tensions within communities.

A widowed home-owner receives dedicated technical assistance.

Chapter 12

Social Aspects in Program Design and Implementation

Why Needed?

Each post-disaster reconstruction program is unique because each operates in its own context. It is therefore critical to understand the social dynamics in post-disaster settings and account for these, so as to ensure that the program does not exacerbate existing social inequities. In an ideal setting, the program should be empowering in nature, helping alleviate social tensions and catering to the needs of vulnerable segments of the disaster-affected population. At the very least, the program should ensure that it is not leaving vulnerable groups even more disadvantaged.

The Pakistan Experience

In the Pakistan case, a number of specific issues related to the social context arose which the Rural Housing Reconstruction Program had to account for. These included:

- Ensuring equity for landless households;
- Cases of multiple families living under one roof;
- Focusing especially on women and orphans for Program assistance.

Policy for landless households

The Rural Housing Reconstruction Program included a caseload of eligible households who had either lost land due to the earthquake, or owned land which was highly hazardous for residential use. As safe land was a precondition for reconstruction, these families were precluded from starting reconstruction until and unless they resolved the issue of a safe site. A **separate but associated program for landless households** was developed by ERRA under the ambit of its social protection activities. It was estimated that over 10,000 families lost land on which they originally had their homes and therefore had nowhere to rebuild their houses. In some other cases, land had become extremely hazardous and was considered unsafe for habitation.

The Landless Program, launched more than a year after the disaster, provided **financial assistance** to households to enable them to access and purchase new land to reconstruct their homes. At a later stage, this Program also included households which were **'virtually landless'** - those living on highly hazardous land requiring new land to build a safe house. Families who lost land due to the earthquake, or whose land was rendered unsafe, were given financial assistance of PKR 75,000 to purchase land. This was over and above the housing reconstruction grants that they were eligible for.

In order to facilitate and expedite the process of land transactions, the Government set up **Land Verification Units (LVUs)** at the local level. These functioned as one-window operations to process landless cases. Legal, administrative, and financial transactions were processed through formal mechanisms, accelerated processes, and binding agreements. LVUs and one-window operations were extremely efficient: the land mutation process which normally took weeks was completed in a single day, with significantly reduced costs as well. In total, 48,000 cases were considered, leading to 14,000 families receiving land purchase grants. Out of these, 15 percent were extremely vulnerable families.

Dealing with extended families under one roof

During the policy development phase, it was decided that the housing reconstruction grant would be provided on the basis of **houses and not households**. Thus, if more than one family was residing under one roof, reconstruction/repair tranches were given to the household which was the owner of the house under question. An undertaking (akin to a no-objection certificate) was obtained from other residents/households – usually relatives such as brothers or sons – that they had no objection to the subsidy being given to one person who would build the house on behalf of all households. In cases where such agreements were not reached during the comprehensive damage assessment and beneficiary eligibility survey (when MoUs were signed), no assistance was given until the extended family was able to sort out their differences amongst themselves and request re-inspection.

Focusing on women and orphans

In Pakistan, it is customary for male heads of household to manage all financial and legal matters, leaving households with no men at risk of vulnerability. The Rural Housing Reconstruction Program facilitated households without adult male members to process MoUs and access financial assistance through legal protection measures securing their property rights. This ensured that women-headed households and orphan households also received due assistance.

A large number of women were new widows whose husbands had died in the earthquake. As a policy, the Program transferred the housing reconstruction grant MoU to the wife. In addition there were pre-existing widow- and women-headed households which needed to access assistance. In total over 42,000 MoUs were issued in the name of women as heads of household. ERRA also established a gender unit within the organization to ensure a gender lens on all strategies, and collected data disaggregated by gender.

In cases where there was no adult male or female surviving to sign the MoU agreement with the Program, the surviving underage beneficiaries were still eligible to receive the grant for reconstruction/repair. This was managed through the legal nomination of guardians for the orphans, and the disbursement of financial assistance to the account of those guardians. The guardians undertook to ensure the reconstruction of the house, and compliance with Program terms and conditions on behalf of their charges.

Reconstructing their own houses helped home-owners transcend their trauma and grief.

Lessons Learned – Considerations for Future Programs

Understanding of the social dynamics is essential. Social inequities should be addressed or, at a minimum, not exacerbated	RHRP made particular efforts to reach vulnerable groups and ensure that they were not further disadvantaged. It focused on the landless, widows and orphans.
Special policies and measures are needed for landless people	ERRA developed a special policy for landless people, with different provisions to that for housing reconstruction. The establishment of Land Verification Units greatly facilitated processes of land transfer and resolution of land disputes.
Support can be provided even to groups that are socially very disadvantaged	Despite the affected area being very conservative, ERRA was able to provide housing reconstruction support to women-headed households, and even to orphans. The latter was done through signing of MoUs with the children's guardians.
Social empowerment is possible	By signing MoUs for housing reconstruction with women, RHRP contributed to the empowerment of women in a traditionally conservative and male-dominated society.

A sub-district level Grievance Committee for complaint registration and resolution.

Chapter 13

Grievance Redressal Mechanisms

Why Needed?

In order to ensure the principle of equity in the operation of a reconstruction program involving a large number of affected households, and enhance the legitimacy of the program for its beneficiaries, a formal mechanism needs to be developed that streamlines the handling and resolution of complaints and grievances faced by beneficiaries. Such a formal grievance redress mechanism will also provide an important quality control function for the reconstruction program; by gaining feedback directly from program beneficiaries, and by enabling program managers and authorities to continually improve the program's design, operations, and implementation.

Suggested Results Framework

Component: Grievance Redressal Mechanism	
Intermediate Outcome	**Intermediate Outcome Indicator**
Creation of a formal mechanism to streamline handling and resolution of complaints and grievances of Program beneficiaries, to enhance principles of equity and Program legitimacy	Formal grievance redressal mechanism created and made accessible to all eligible households within 'x' months of Program launch
	% of accepted grievances successfully resolved by formal grievance redressal mechanism
	Average # of days taken to successfully resolve a grievance once it enters the Grievance Mechanism MIS

Achieving Program Results – The Pakistan Experience

GRM to streamline handling and resolution of complaints

The Program focused on developing a **Grievance Redressal Mechanism (GRM)** to streamline the handling and resolution of complaints and grievances faced by beneficiaries. This mechanism relied on both informal, field-level dynamics as well as a formal and institutionalized system, monitored at the top by the Program central management to determine results, outputs, and trends. This formal system fed into a management information system developed centrally, which enabled the Program implementing agency to perform these functions efficiently and effectively.

A formalized GRM was launched more than a year after the Program commenced. This was a simple, low-cost, and automated system and was **based on four tiers** – village/community, where it was informal and fast-track; tehsil (sub-district), which was formal in nature; and district, which was also formal in nature and where appeals to decisions at the sub-district level were heard. At the final level, the Program implementing agency centrally tracked data on complaints redressal to determine trends and problems. Figure 4 provides a snapshot of the tiers of the system.

Figure 4: RHRP Grievance Redress System

Community level	■ Informal and fast tracked ■ Run by Partner Organizations - especially NGOs providing technical training
Sub-district level	■ Formation of Tehsil (sub-district) Grievance Committee ■ Tehsil Grievance Committee composition: Representatives from government, Army Engineers, PO (NGO), political figure/VRC ■ Each complaint recorded in writing and given reference number
Appeal at district level	■ Formation of District Grievance Committee ■ District Grievance Committee composition: Representatives from government, Army engineers, PO (NGO), political figure ■ Decisions taken at District level final
Central program level	All grievance decisions sent to Central Program HQs, which conducted periodic reviews to determine: ■ trends or biases emerging in Grievance Redress committee decisions ■ timely resolution of grievances ■ consistent resolution of grievances across various Committees ■ whether certain steps in the Program were causing high number of grievances ■ progress towards achieving GRM targets and expected outcomes

A number of **district-level Data Resource Centers (DRCs)** were also established in the affected areas to deal with certain kinds of complaints and grievances related to personal and financial data. These DRCs were run by the National Database and Registration Authority (NADRA) that was running the main MIS for the Program, and thus had complete data on beneficiaries and financial disbursements linked to its central national-level ID system. These DRCs handled grievances related to:

- incorrect ID card information
- missing bank account information
- bank account information duplication
- missing records

The creation of these DRCs was a response to manual operations and data processing of complaints at field level that were slow, and were leading to a significant backlog of unresolved grievances.

Another key feature of the Program GRM was the creation and continuous operation of a **centralized Call Centre** established within ERRA. This Call Centre was available nationally, and was able to respond to complaints and grievances on the phone, recording them for necessary action and follow-up.

Lessons Learned – Considerations for Future Programs

A robust grievance redress mechanism is essential	RHRP established a grievance redress mechanism to deal with any complaints in relation to the housing reconstruction program, and ensure that these were addressed eficiently. To promote this, the mechanism comprised four tiers, the first of which at community level was informal and fast-track. Higher tiers were formal.
Involvement of different stakeholder groups enhances effectiveness	Tehsil and District level Grievance Committees, set up as part of the RHRP grievance redress mechanism, had representation of partner organizations, government, army, and local politicians.
An effective grievance redress mechanism can provide useful inputs for monitoring and evaluation	Complaints received under RHRP were centrally monitored, and served as a source of feedback from beneficiaries and communities about the program, in turn helping inform course corrections and modifications.
Different mechanisms can be useful for different kinds of complaints	A number of district-level Data Resource Centers (DRCs) were established to deal with certain kinds of complaints and grievances related to personal and financial data. These were run by NADRA, and handled grievances related to registration and banking details – already being managed by NADRA. The DRCs reduced the backlog of unresolved grievances at field level.

Panoramic view of newly constructed seismic-resistant houses.

Chapter 14

Reporting, Monitoring, and Evaluation

Why Needed?

Having an outcomes-based information management system can play a central role in the overall management and implementation of a post-disaster reconstruction program. A focus on timely monitoring of progress in the program can help ensure that all inputs and activities are **concentrated on achieving results** and adjusted accordingly. Moreover, all activities are measured in terms of delivering safe reconstruction, which should be a pillar of any such program.

The nature of a reconstruction program is such that a robust system is often needed to manage the scale of construction activity, information flows, and financial resources. Reporting, monitoring, and evaluation systems built on information and communication technologies (ICT) can help ensure that field information is systematically processed to track progress, and ensure that policymakers can make the program a dynamic, field-driven model to ensure desired levels of transparency and accountability.

Combining the functions of reporting, monitoring, and evaluation (RME) can ensure that a post-disaster reconstruction program is dynamic in its scope and responsive to emerging needs in the field. Regular and structured flow of information to policymakers, based on key program indicators and desired outcomes, can result in faster decision making which improves the chances of successful achievement of program objectives.

Suggested Results Framework

Component: Reporting, Monitoring and Evaluation	
Intermediate Outcomes	**Intermediate Outcome Indicator**
Creation of an RME system to standardise and compile all data streams including reconstruction progress, seismic compliance, and technical support activities, and use tools to make information available to a range of stakeholders for Program analysis and planning.	Forms and methodologies devised to manage information on reconstruction progress, compliance and non-compliance, financial disbursement, and training and capacity building Database developed with transparent, reliable, and up to date information on all Program beneficiary households Consolidated and summarised information on key trends (seismic compliance and non-compliance, physical reconstruction, financial disbursement) produced periodically for key stakeholders

Achieving Program Results – The Pakistan Experience

Creation of RME system to standardise and compile all data streams

In Pakistan, the management of the post-disaster Rural Housing Reconstruction Program at such a vast scale and pace, as well as the adherence to policy objectives, relied on access to and analysis of timely and accurate data from the field to report, monitor, and evaluate reconstruction progress, seismic compliance and non-compliance and financial disbursement. Household-level inspection and certification of each beneficiary house and linked tranche-based grant disbursements put **monitoring at the centre of the Program** for all stakeholders and especially each household, holding them accountable for the MoU signed at the start, and keeping safety as the priority criteria for the Program.

The Program developed a comprehensive RME system to function as a coordinated system for all data streams from various stakeholders to be compiled centrally. This provided reporting on a disaggregated level on key program outcomes.

How the RME was developed

The RME system development tried to use data sources related to individual Program components that were already functioning, and also developed new data streams specifically for RME that captured more results-oriented information.

The following databases existed under individual Program components which were consolidated into the RME system:

- Beneficiary eligibility database
- Grant disbursement database
- Training and capacity building database
- Plinth and Lintel-Level Inspection/Certification Forms
- Since the existing databases were not capturing all aspects of the required data, more streamlined data flows were created with a focus on results-based reporting and monitoring:
- Physical progress – number, type, and percentage of houses at various stages of reconstruction
- Interim data on seismic compliance – by number, percentage, and type of houses at various levels of reconstruction

Functions of RME

The RME system helped consolidate all existing data streams, and developed new ones, to help report on and monitor required Program outcomes. It served numerous functions that helped the Program managers gain a closer and more insightful look at key aspects, especially related to compliance on seismic-resistant construction. It also helped the Program management produce very useful knowledge products for policy analysis and operational policy revisions. Figure 5 outlines the key functions provided by the system for Reporting, Monitoring, and Evaluation purposes.

Figure 5: Key Functions of RME System

Reporting

- **Generates disaggregated periodic reports on:**
- Physical Progress
- Number of houses under construction out of those visited by AI teams
- Stages of construction reached by beneficiaries in % terms, and rate of physical progress on a time scale
- Financial Progress
  - *# and % of beneficiaries having received various grant instalments*
  - *Total amount disbursed to beneficiaries against various grant instalments*
  - *Rates of tranche disbursement on a timescale*

Monitoring

- Periodic monitoring of rates of seismic compliance on disaggregated basis
- Correlating rates of seismic compliance with:
  - *Coverage and output of training Program*
  - *Reasons for non-compliance*
  - *Any other available quantitative and qualitative parameters, such as availability of materials, adequacy of designs, consistency of AI regime, etc.*
- Helps identify problem locations and devise appropriate interventions, thus promoting informed decision making.

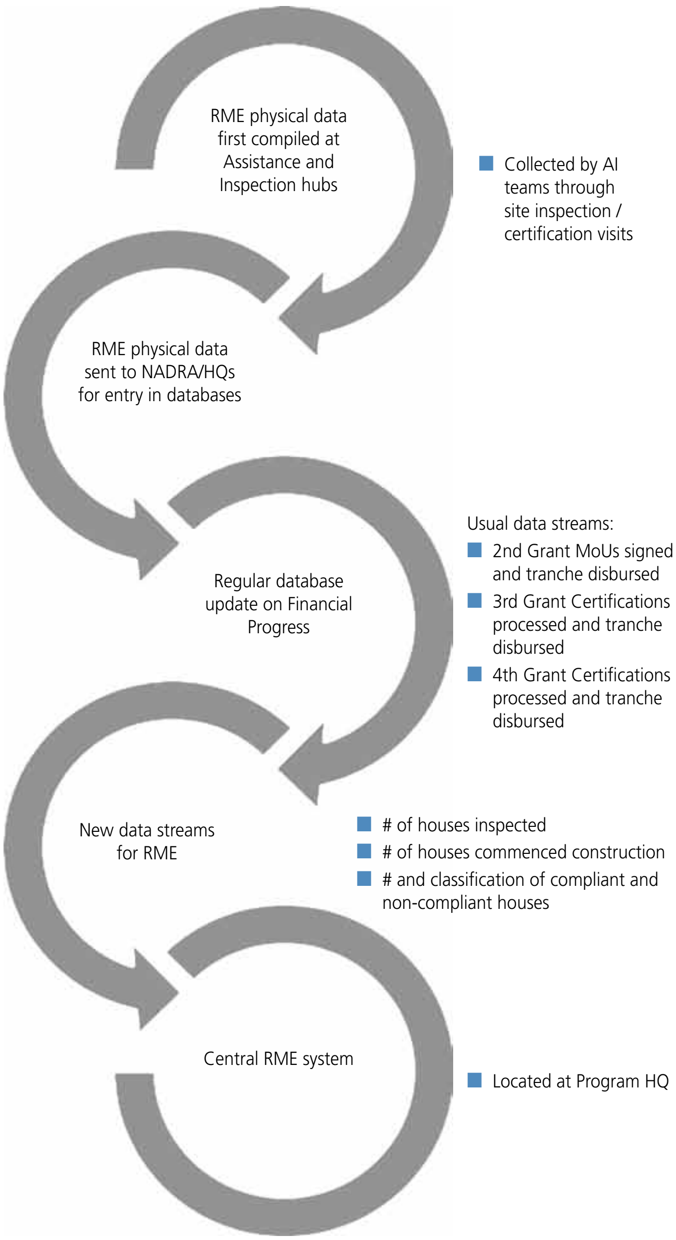
Evaluation

- Furnishing readily available disaggregated data for third-party evaluations, especially for facilitating sample size determination and targeting.

Flow of information and data from field to management

Figure 6 illustrates how data and information flowed from the field to the central Program management via the RME system and its associated data streams:

Figure 6: Flow of Data from Field to RHRP Management



Lessons Learned – Considerations for Future Programs

Standardized and centralized systems ensure Program efficiency, transparency, and consistency	A key principle in the Program was equity and consistency in both financial and technical assistance. All forms and methodologies were standardised, making processing and compilation easier. The lead implementing agency – ERRA, retained centralised control providing accountability and reducing confusion or parallel systems.
Partnering with expertise reduces burdens on the Program	The Program greatly benefited from the experience and expertise of institutional and implementing partners working collaboratively to develop systems. It was not necessary for the central implementing agency to develop capacity in-house; rather it was more efficient and cost-effective to establish partnership agreements with agencies which could provide a range of services.
Images provide great documentation	This was a technical Program with considerable needs for process engineering and field information in the form of images. However, these were not used in an optimal manner. Greater planning and budgeting for the collection, use, and management of GPS data, GIS, and particularly digital photographs could have further strengthened the Program considerably.
Baseline data in housing is often unavailable	There was a lack of robust pre-disaster data on private and rural housing, particularly qualitative information such as prevalence of construction types, which would have been useful in reconstruction. This made it difficult to measure the impact of reconstruction against pre-disaster conditions.
Indicators determine monitoring priorities	In general, the success of the Program was primarily based on housing completion, compliance, and financial disbursement. These were formal indicators measured against set targets. Several other aspects of reconstruction, such as household sanitation, cost of construction, and awareness of risk were formally tracked only retroactively to inform policy development.
Need to monitor the economics of reconstruction	While the Program monitoring involved comprehensive systems to track financial disbursement, other aspects of the economics of reconstruction were not formally monitored or evaluated. These included cost and availability of materials, impact of location, access and transport, savings, loans, remittances, migration and livelihoods, or the cost and benefit of various activities in technical support.

Back to the idyllic routine of life with homes, lives and livelihoods fully restored.

Chapter 15
Post-Script: An Emerging Culture of Disaster Risk Reduction

The ambitious scale and scope, as well as the long duration of the Rural Housing Reconstruction Program, meant that some of its interventions and approaches outlasted the Program itself, and became mainstreamed. These include support for disaster risk reduction and transparent payment systems for program grant beneficiaries.

Introduction of Multi-hazard Risk Mapping and Improvements in Building Codes

Multi-hazard risk mapping enhances the effectiveness of post-disaster reconstruction and is also an essential step for disaster risk reduction in the future. In Pakistan, such an exercise was envisaged to be conducted concurrently with the Rural Housing Reconstruction Program. However, this did not happen for numerous reasons. Instead, after the Program finished and following the creation of an institutional mechanism for disaster management in Pakistan, this task is now being taken up with the support of international partners. An important lesson learned is that having such an assessment done in concert with a similar program will add tremendous synergy, and contribute greatly to the disaster risk reduction agenda on a national level.

While a comprehensive risk mapping exercise was not conducted, the government was able to conduct a seismic risk assessment of the affected region in parallel to the Program. This was done using existing, in-house capacity, and it informed key aspects of the Program. Houses that were identified as being located in high risk zones were barred from reconstruction in-situ as the site was declared dangerous, and the affected households were compensated via a Landless Grant program to allow them to purchase new land to rebuild their destroyed houses. Moreover, the government also suggested changes to the various Building Codes on a provincial level to incorporate seismic-risk considerations, based on division of the country into various seismic risk zones.

Creation of Institutions for Disaster Management

There is a critical need for countries prone to recurrent disasters to strengthen their response capacity as well as reduce their hazard vulnerability to mitigate future losses. A key aspect of this capacity building is institutional development. In Pakistan the reconstruction experience soon led the government to establish the National Disaster Management Authority (NDMA), as well as Provincial Disaster Management Authorities (PDMAs) in all provinces. This was in addition to the establishment and operationalisation of the Program implementing agency, the Earthquake Rehabilitation and Reconstruction Authority (ERRA).

NDMA has emerged as the key coordinator in post-disaster situations in Pakistan – which has faced a series of disaster events since 2005 – particularly in the immediate relief and recovery phases. NDMA is also actively promoting the disaster risk reduction agenda in Pakistan.

Trained Personnel for Seismic-Resistant Construction and Continued Use of Good Practices

The Program aimed to develop a culture of seismic-resistant construction in the affected area, and continued use of these techniques even after its completion. A significant effort was thus made to ensure that a large force of masons, craftsmen, artisans and construction workers from the affected area and beyond were trained in relevant skills. A critical mass of trained personnel was thus developed. Anecdotal evidence suggests that houses outside the Program's scope, or additions to core units funded by owners themselves, were also being built to seismic-resistant construction standards.

Moreover, this training process in seismic-resistant construction techniques was institutionalized at the country level, and training curricula developed by the Program were adopted by national-level vocational and technical training institutes for their courses and certifications, thereby expanding the scope of Program benefits outside the disaster affected area.

Transparent Grant Payment Mechanism

A major achievement of the Program was the development of a system to transfer grant payments directly into beneficiary bank accounts, and the linking up of that system with a pre-existing national-level citizen identification database. This required significant mobilization in a large, dispersed, and remote affected area to ensure all beneficiaries had bank accounts or alternative savings mechanisms. This process greatly reduced the risk of leakages of grant payments by cutting out middlemen. In the intervening years, this post-disaster grant payment mechanism has set a positive precedent in Pakistan, and has been further developed since the Program. Following the 2010 and 2011 floods, beneficiaries received compensation grants through a centralized system of debit/ATM cards that were linked with the national-level citizen identification database.

Consolidated RHRP Results Framework

Program Goal / Desired Impact	
Provide financial and technical assistance to disaster-affected home owners in reconstructing or rehabilitating their damaged houses to disaster-resistant standards, using a home-owner driven, but assisted and inspected construction regime. Inculcate a culture of voluntary compliance in the affected area by inducing a behavioral change and culture of compliance to disaster-resistant standards.	
Program Outcome Indicators	% homeowners found well versed in seismic-resistant construction principles
	% homeowners extending their core housing unit in accordance with seismic-resistant construction principles
	Evidence of non-Program houses in affected area being constructed to seismic-resistant standards
	Evidence of seismic-resistant construction guidelines being replicated across the country
Intermediate Outcome Indicators	% of eligible beneficiaries receiving restoration/reconstruction grants
	% houses reconstructed/repaired using seismic-resistant standards (Rate of seismic compliance)
	Introduction of seismic-resistant construction standards training in national building code

Component: Institutional Arrangements	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Establishing and capacitating dedicated reconstruction agencies, responsible for undertaking post-disaster reconstruction programs from strategy development to implementation	Enabling legislation passed to create institutional mechanisms for implementing post-disaster reconstruction programs
	Dedicated agency established and capacitated for implementing and managing post-disaster reconstruction program
	Linkages developed and formalized with national and international partners to support reconstruction program
Institutional development for longer term disaster risk reduction on national level	Institutional support provided for national level long term disaster risk reduction

Component: Damage Assessment and Beneficiary Eligibility Verification Survey	
Intermediate Outcome	**Intermediate Outcome Indicator**
Rapid post-disaster preliminary damage and needs assessment to develop a baseline for reconstruction programs	Preliminary damage assessment by local administration completed immediately after disaster
	Preliminary baseline of disaster-affected households and communities created
Formation, training, and mobilization of survey teams across affected areas to conduct damage assessment and beneficiary eligibility verification survey	Survey form developed and tested
	MoU developed- to be signed between beneficiary and survey team
	% of affected area (in administrative units) where survey teams have visited within ‘x’ months after launch of survey
	% of households visited considered eligible for reconstruction/repair grants
	% of households considered eligible for reconstruction/repair grants with which agreement/MoU signed outlining responsibilities of beneficiary and the government
Setting up of central database of eligible beneficiaries along with unique identification numbers	Setting up of centrally-managed eligible beneficiary database, linked to the national identity database
	Key beneficiary information input, based on survey data
Transition of survey teams to Assistance and Inspection (AI) teams for continuing Program implementation	Training regime on assistance and inspection (AI) of seismic-resistant construction developed to retrain survey teams into AI teams
	AI teams mobilized in all affected areas after disbursement of mobilization grant and commencement of reconstruction activity

continues

Component: Grant Payment Mechanism	
Component Objective	**Component Outcome Indicator**
Successful disbursement of housing reconstruction/repair grant to all beneficiary households in tranches linked to certification of seismic-compliant construction	% of eligible beneficiaries receiving all tranches of restoration/reconstruction grants
Documentation of economy and prevalence of bank-based transactions outside of Program	% of beneficiaries regularly operating bank accounts outside of Program grants (such as to receive migrant worker remittances etc.)
Intermediate Outcome	**Intermediate Outcome Indicator**
All beneficiaries able to receive housing grant in bank account or alternative savings/deposit mechanism (such as post office savings account)	% of eligible beneficiaries that opened bank account due to Program, out of those that did not have bank account pre-disaster % of eligible beneficiaries with functioning bank accounts or formal savings/deposit mechanism ‘x’ months after start of Program Financial MIS developed that is linked to beneficiary eligibility database and any available national identity database % of financial transactions involving Program grant disbursements completed via beneficiary bank accounts

Component: Seismic-Resistant Structural Design Solutions	
Intermediate Outcome	**Intermediate Outcome Indicator**
Development of seismic-resistant structural design standards based on familiar materials and methods	Review and assessment of prevalent materials and methods for seismic considerations, especially including documentation of common vulnerabilities such as faulty construction practices causing building collapse/damage Development of affordable seismic-resistant structural standards based on global best practices Mechanism established for review and additions to menu of structural designs
Concurrent development and implementation of Cascade of Training for optimal results	Training materials and curricula developed to educate master trainers, field staff, artisans, and affectees on appropriate implementation of seismic-resistant structural design solutions Model houses and demonstration details constructed at field level to provide hands-on training and samples for reference.
Compliance Catalogue developed	Menu of approved seismic-resistant structural designs consolidated in catalogue form, along with solutions for common problems of non- compliance
Non-Compliance Referral System established	Data on non-compliant construction used to mobilize Assistance and Inspection (AI) and training teams to areas with high rates of non-compliance Non-Compliance Referral System (NCRS) developed for recurrent cases of non-compliance providing detailed technical advice through trained engineering staff

Component: Training and Capacity Building	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Development of Training curricula to implement adoption of disaster-resistant solutions	Training materials and curricula for disaster-resistant design solutions developed for various tiers - master trainers, partner organisations’ staff, artisans and construction workers Model houses and demonstration details constructed at field level to provide hands-on training and evidence of disaster-resistant solutions

continues

Component: Training and Capacity Building	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Training of a critical mass of craftsmen and construction workers across earthquake-affected area in disaster-resistant construction techniques	% of affected area where training on disaster-resistant construction techniques has been provided at field-level to craftsmen and labourers
	# of master trainers/trainer of trainers trained in earthquake-resistant construction standards
	# of masons/artisans/craftsmen trained in key trades
	Database of trainings provided created and linked with other Program databases
Prevalent use of disaster-resistant construction standards in reconstructed houses	% of grant beneficiaries sensitized to earthquake-resistant construction of houses
	% of houses reconstructed/repaired using disaster-resistant standards (Rate of disaster compliance)
Institutionalized support for disaster-resistant construction in earthquake-affected areas and beyond	Introduction of disaster-resistant construction standards training in national or sub-national level vocational training programs

Component: Assistance and Inspection Regime	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Development of Standard Operating Procedures and related Training curricula for implementation of Assistance and Inspection (AI) regime	SOPs for AI regime developed for assisting, inspecting, and certifying seismic-resistant construction
	Training curricula developed and Training provided to AI teams on processes and criteria for assistance, inspection, and certification
Mobilization of Assistance and Inspection teams in the field across entire affected area for entire length of the Program	# of Assistance and Inspection teams trained and mobilized in affected areas
	% of affected Union Councils (or equivalent administrative units) with field presence of AI teams ‘x’ months after Program launch
Synchronization of data streams from Assistance and Inspection regime with Program database, for effective monitoring and management	Data on construction and compliance updated in real-time after every AI team field visit to affected community
	Average time in # of days, between AI visit and recording of certification/inspection data in central database (per UC)

Component: Public Information Campaign	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Development and dissemination of information materials for mass media to enhance Program knowledge and deliver key messages to beneficiaries and various stakeholders	Information seminars and events conducted on site in affected areas and displacement camps to spread Program basic information
	Information material and content developed for, and aired on, local radio channels in affected areas to spread Program information on basic as well as specific matters
	Information material and content developed for and presented in local print media to make specific announcements related to Program issues
	Localized traditional informal channels (mosques, markets, area notables etc.) mobilized for spreading Program messages in affected areas
Development and dissemination of technical information materials for varied audiences and key stakeholders outlining technical standards on disaster-resistant construction	Technical information material on disaster-resistant construction using visual tools and in local languages developed and spread amongst key stakeholders such as POs, trainers, inspection/certification teams, construction workers, beneficiary households.
	Trainings provided to inspection/certification teams, PO staff and other stakeholders on use of technical information materials.

Component: Building Materials Supply Chain and Hubs	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Availability of required quantities of building materials ensured across affected area within affordable price range.	% of affected area with operational building materials hubs ‘x’ months after Program launch
	Mechanism established to monitor prices of required building materials to report variances and inform interventions/actions

continues

Component: Partnership Models for Coordinated Implementation	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Specialized skills and expertise of various partners utilized in all aspects and components of Program, from strategic underpinnings to design and field-level implementation	Program partnership base broadened and diversified to include local, national, and international stakeholders All Program partners agree to implement Program components (training, technical assistance, A&I, etc.) according to same standards and guidelines using uniform Program objectives % of affected areas with field-level presence of Partner Organizations during entire length of the Program

Component: Community and Social mobilization	
Intermediate Outcomes	**Intermediate Outcome Indicators**
Institutionalization of community-based approach towards implementing key Program aspects, through creation and capacity building of village-level committees	Social mobilization training for field-level staff of Partner Organizations developed and delivered centrally % of affected villages where Village Reconstruction Committees established with assistance from Partner Organizations Synergies developed with other Partner Organization community-level activities such as trainings on disaster-resistant reconstruction

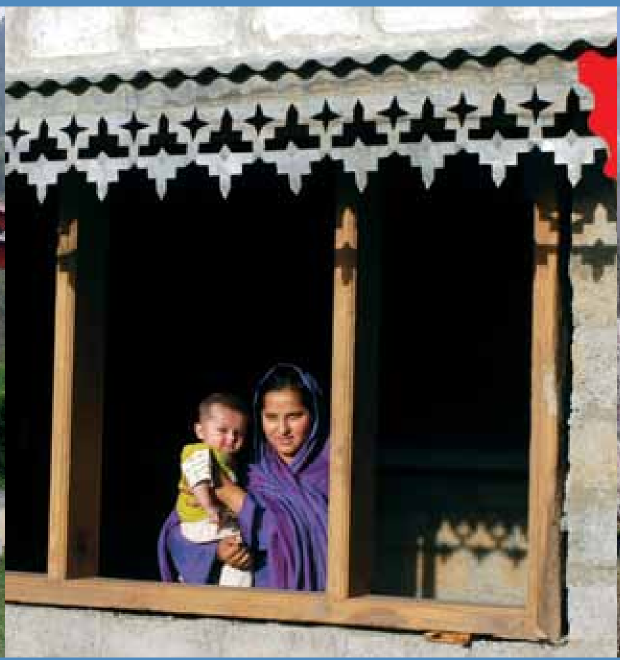
Component: Grievance Redress Mechanism	
Intermediate Outcome	**Intermediate Outcome Indicator**
Creation of formal mechanism to streamline handling and resolution of complaints and grievances of Program beneficiaries, to enhance principles of equity and Program legitimacy	Formal grievance redress mechanism created and made accessible to all beneficiary households within ‘x’ months of Program launch % of accepted grievances successfully resolved by formal grievance redress mechanism Average # of days to successfully resolve a grievance once it enters the Grievance Mechanism MIS

Component: Reporting, Monitoring and Evaluation	
Intermediate Outcomes	**Intermediate Outcome Indicator**
Creation of RME system to standardise and compile all data streams including reconstruction data, seismic compliance, technical support activities and use tools to make information available to range of stakeholders for Program analysis and planning.	Forms and methodologies devised to manage information on reconstruction status, compliance and non-compliance, financial disbursement and training and capacity building Database developed with transparent, reliable and up to date information (personal details, physical reconstruction and financial disbursement status, etc.) on all Program beneficiary households Consolidated, summary information on key trends (seismic compliance and non-compliance, physical reconstruction, financial disbursement) produced periodically for key stakeholders

Learning from the Pakistan Experience: Rural Housing Reconstruction Post-2005 Earthquake

The October 2005 earthquake in northern Pakistan caused massive loss of life and assets, with an estimated 73,000 people killed and more than 2.8 million left in need of shelter. In response the Government of Pakistan, in collaboration with international partners, launched the Rural Housing Reconstruction Program (RHRP) which scored many firsts and is today regarded as an international best practice. Pakistan's experience with post-earthquake housing reconstruction showcases a model of effective design and implementation of an ambitious program targeting 600,000 units spread across a vast, inhospitable mountainous terrain. It taught numerous lessons, many beyond a post-disaster response.

This Manual is meant to be a guide for decision makers and managers tasked with the design and implementation of a housing reconstruction program, in the aftermath of a major disaster. It describes the key principles, strategies, components, processes, tasks, and interventions involved in the design, management, and execution of such programs, using Pakistan's post-earthquake Rural Housing Reconstruction Program as a case study to draw on its experience and lessons. The Manual also provides a strong results-based outlook through a results framework that links desired impacts, program level and intermediate outcomes, and outputs into a coherent whole.



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