



Earthquake Reconstruction
& Rehabilitation Authority



Rebuild, Revive
with
Dignity & Hope



Moving Mountains: The Story of Debris Removal from the Earthquake-hit City of Muzaffarabad, Pakistan



PREFACE

The mammoth task carried out by the Earthquake Reconstruction and Rehabilitation Authority (ERRA) has a human face, too, which is being brought out in the case studies on selected themes from reconstruction programme sectors. The story of the process of the environment programme of ERRA is one of the series. Other programme sectors include Rural Housing, Education, Health, Urban Housing, Town Planning, Livelihood, Social Protection, Water & Sanitation, Road/Transport, Telecommunication, Power and Government Buildings.

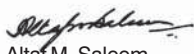
ERRA's mandate includes restoration and reconstruction of physical assets and infrastructure as well as revival of livelihoods that were lost in the massive earthquake of October 8, 2005. The coverage extends to 3.5 million affected populations in nine districts of AJK and NWFP spread over an area of 30,000 sq. km. that consists of difficult mountainous terrain, remote and dispersed settlements and a population unaware of the hazards of natural disasters of this scale.

The reconstruction programme that took off in April 2006 is now gaining momentum. A large number of private housing units are being built on seismically resistant designs. All Education and Health facilities are made functional, some in newly constructed buildings and others in interim structures. Water facilities have been provided at the doorstep or in community dwellings while mechanism for testing of water quality and filtering system has been established, in some areas for the first time in the history. Sanitation infrastructure at community level has been restored and attitude towards personal and external hygiene has been built through awareness raising. As livelihoods of people are being revived, measures for protection of environment have also been introduced. Skills' training has been provided to both men and women and as a result a pool of skilled/semi skilled workers have been developed. Community participation was ensured in the process to create a sense of ownership.

ERRA takes pride in being able to catalyze the process of social change in communities through programme interventions that are pragmatic and people focussed. Over the last one and a half years, while striving to convert this adversity into an opportunity, ERRA established close affiliations with communities it stands to serve. The period is marked with mutual learning and sharing of success and failures with stakeholders.

While this process will go on for a few more years, it is important to create milestones from time to time to keep the spirit of work and sense of achievement alive. The brief snippets captured in these case studies are a harbinger of a bigger social change in the offing.

It is also an occasion for ERRA to reiterate its commitment to the earthquake-affected people to deliver the reconstruction and rehabilitation programme with full dedication. It is not an end in itself, but a means to achieve a better quality of life across board.



Altaf M. Saleem
Chairman



Like always, the beautiful city of Muzaffarabad was teeming with life and buzzing with activity on October 8, 2005. That is, until 8:50 in the morning, when a disastrous earthquake struck and turned the city into heaps of debris and rubble. Buildings that had faithfully provided shelter, livelihood and a host of other facilities for the thousands of residents of the capital city of the state of Azad Jammu and Kashmir (AJK) turned into their graves. Removing the debris and rubble of these buildings became one of the most daunting tasks that then faced the government and its development partners, who flocked from all over the world to lend a hand in restoring normalcy and bringing back smiles to the faces of the people of the earthquake-affected areas of Pakistan. This is the story of a formidable effort to move the mountains of rubble, a task that started on the very first day of the disaster, continues today and is likely to carry on for some time to come.

Minutes after the catastrophic earthquake, debris and decrepit buildings dominated the landscape of Muzaffarabad, blocking almost all

roads and streets, and choking water supply and sewerage lines. Those who had survived found it extremely hard to access food, shelter and medicines - huge piles of rubble, at places two or three storeys high, stood between them and the basic necessities of life. As a result, business ground to a halt and a majority of the shop owners and inhabitants of the city fled or found refuge in relief camps set up for them.

It was extremely important to remove debris in order to recover life and property, to open roads for relief operations and to save the environment from further contamination. In other words, life could not return to the city without clearing the rubble.

The government and its development partners, the national and international development organisations supporting it, took up the challenge and started the Herculean effort that goes on even now. NATO (North Atlantic Treaty Organization) forces and US army engineers joined hands with

the AJK Public Works Department (PWD) in the task of removing rubble. By the following spring, other organisations - including Food for the Hungry, Japan International Cooperation Agency (JICA), Mercy Corps, Oxfam and the International Organisation for Migration (IOM) - had also joined the effort.

A good part of the work was done by the IOM which had received a grant of US\$1.5 million¹ from USAID for debris removal. The IOM started with the aim of removing approximately 16,000,000 cubic feet of rubble from the urban areas of the municipality of Muzaffarabad. Its main objective was to support the municipality execute its own plan in a more cost-effective, environmentally aware and rapid manner. The municipality prioritised the areas for the IOM to work in, in order to focus efforts in areas which had faced the worst of the disaster in the city.

It was important to remove debris in an orderly and effective manner in order to protect public health and safety. To achieve this objective, the first priority was, thus, clearing debris from key roads to provide access for emergency vehicles and resources into affected areas. The second priority was providing access to critical facilities pre-identified by the AJK and North West Frontier Province (NWFP) governments. The third priority of the debris removal teams was addressing the elimination of debris-related threats to public health and safety. This included such things as repairing,

demolishing or barricading heavily damaged and structurally unstable buildings, systems or facilities that posed a danger to the public. All actions taken to mitigate or eliminate threats to public health and safety were closely coordinated with the owner or responsible party. By March 2006, an estimated 2.3 million cubic metres of debris had been removed and all the streets of the city had been cleared.

As space for shelter was occupied by rubble, there was a great demand for rubble removal in the city. In response, contractors, labourers and middlemen dealing in steel moved to the city. Every day hundreds of labourers could be seen breaking concrete for disposal. A walk around the most damaged areas of Muzaffarabad revealed men hard at work with hammers and shovels, tearing down houses and removing rubble. Apart from working for internationally funded rubble removal efforts, these labourers also usually worked for contractors engaged in this work since there was money to be made in demolishing houses.

Demolishing houses for steel made sound economic sense. Much of the construction in Muzaffarabad is reinforced concrete. The rebar in the concrete can be sold for scrap at handsome rates. A properly reinforced house (though not all were built like that) has enough steel to pay three or four times as much as the cost of the labour required to remove it. House sizes varied widely, from single storey

¹ USD 1 = PKR 60.58 (as of September 16, 2007). Conversion rates are from www.xe.com; all conversions in the text are approximate.

cottages with a minimum of 1,458 square feet, to large multi-floor, multi-family residences topping out at over 16,000 square feet. Payments reflected the varying size and construction quality of the houses as well as the materials used and the ease of access. People with wood or stone houses had to pay out of their pocket for these services, while homes with a lot of rebar could bring up to PKR 70,000. Homes which were small and difficult to demolish paid back very little to their owners. A very approximate average price offered to demolish a house and remove the valuables in it was about PKR 25,000.

Contractors usually agreed to pay a pre-determined fee to the homeowner. This allowed them to remove the rebar and anything else that was deemed valuable including fixtures, wood, pipes, doors, wires, etc. These things were sold in the open market to middlemen specialising in various materials. The steel, by far the most valuable part of the house, could be sold several times over to brokers and middlemen before it ended up at a mill for remelting. Some of the rebar, if not too damaged, could be reused immediately.

Virtually every homeowner wanted to use the money from rebar sales to start building a new house, pay off debts accumulated during the months since the earthquake or help with continuing expenses. Immediate plans were either to pitch a tent on the cleared lot or start rebuilding

immediately. At this point, however, rebuilding signified building a wall to enclose their property, even if it was only a few feet high, to give some sense of privacy and definition to the property.

In this spontaneous business activity, however, not only were homeowners losing money to middlemen because the actual worth of these items was much higher, they were also burdened with the cost of demolishing. Moreover, some wood and valuable construction materials that could be recycled and used within the city were being shifted out, raising the cost of reconstruction. It was therefore important to support people in the process of demolishing the houses, before they could be helped to rebuild them.

Despite the USAID-funded project and private demolishing activity, the bulk of the debris remained in the city. Most private buildings were standing in dangerously damaged form. It was important to demolish them and remove the debris. During the reconstruction phase, generation of large quantities of rubble was forecasted; it was necessary to make arrangements for its removal as well. The government of AJK also prepared a master plan for rebuilding the city in a more safe way, which also required debris removal on a large scale.

To deal with the problem of the removal of debris from Muzaffarabad city on a permanent basis, the Earthquake Reconstruction and

Rehabilitation Authority (ERRA) approved a three-year project in late 2006, with a cost of PKR 409.25 million, to be executed by the Municipal Corporation of Muzaffarabad (MCM). After conducting a comprehensive survey of the city, the MCM found that 1,126 houses were dangerous and needed to be demolished. Dividing the city into four zones, the MCM has set itself to the job of removing all debris from the city. It has adopted procedures that pay extreme care to people's rights over property and their sensitivities to what were their homes before the earthquake. Owners of buildings are fully involved in the process; they are required to apply in writing, to fill up an affidavit declaring their consent and affirm their ownership of the property. All houses are fully documented and graded before demolishing. The contractors, on their part, are required to carry out their activities with extreme care so that all reusable material could be retrieved and given back to the owner. "Some 20 percent material of a demolished house is returned to the owner for reuse, while the rest is dumped carefully at designated dumping sites," explains Khwaja Ansar, a contractor.

This level of caution requires that a minimal use of machinery be made. Another compulsion for not using machinery is the simple fact that streets are so narrow in some areas of the city that no machinery can be brought in.

Dumping the debris in a safe way is another major challenge that required immaculate planning. The city of

Muzaffarabad comprises the valleys of the Jhelam and Neelum rivers. Any irresponsible dumping leads to polluting the two rivers and threatens the health of the communities living downstream. Silting of the river also poses a threat to Mangla Dam located downstream. From the very beginning, the ERRA has tried to guard against dumping sites emerging here and there haphazardly. While all earlier dumping was done at a site called Makri (now turned into a park), a new dumping site has been developed on the banks of the Neelum river.

Using new technology, a good part of this rubble can be recycled and reused for building blocks and other building materials. For this purpose, the MCM is getting a rubble recycling plant, possible due to a donation by the Belgian government, which will be erected on the dumping site, turning rubble into useful materials for reconstruction. It will also decrease the need for the exploitation of new raw materials, an operation that sometimes causes landslides. When the MCM has completed its work, a park will be built on the site.

The MCM has completed the first phase of the project and is about to move into the second phase. So far, 322 houses have been demolished and 1,165,000 cubic feet of rubble has been dumped in a compact form.

By clearing debris and making flat ground available, the project is providing residents the opportunity to finally move out of tents and temporary sheds and



reconstruct their houses. Public sector institutions are also being enabled to reconstruct socio-physical infrastructure. The project is paving the way for the smooth implementation of the Muzaffarabad City Master Plan. "Civic amenities and urban framework will be improved, which will generate a number of economic activities in the city. During [the] implementation of this project, a reasonable number of local skilled and unskilled [people] are getting employment opportunities," explains Arshad Abbasi, Administrator of the MCM.

Even though the project is still being implemented, the MCM can already claim a number of successes. It has been able to maintain the clarity of its overall goal, that is, protecting public health and safety, as well as the resulting prioritisation of tasks. By insisting on proper documentation, the MCM has also been able to safeguard and restore property rights, even under very challenging circumstances. Due to this circumspection, property disputes in the town have been kept to a minimum.

The experience in Muzaffarabad shows that market forces play an important part even during the worst of times and that crisis situations can have their unique market dynamics. Left unchecked or undocumented, unscrupulous businessmen can prey upon the affected communities and harm them financially. During the first phase of relief provision, private contractors were free to carry out the removal of rubble on their own and send useful materials out of town. However, the MCM project proved an antidote to this exploitation as it provided the same service to disaster-affected citizens without any charge.

The work, however, continues and the MCM is optimistic that it will be finished within the timeframe set. Residents hope that, like a phoenix, a new Muzaffarabad will emerge from its rubble and dust - a city which promises to be more safe, more beautiful and more environment-friendly than before.



Life Returns to Khwaja Mohalla

With its winding narrow streets sloping up and down, buildings many storeys high, its bazaars² and cafeterias, Khwaja Mohalla³ evoked nostalgic memories of a time gone by. In its beauty lay the seeds of its destruction. Located in the central area of Muzaffarabad city, Khwaja Mohalla is a residential area, one of the earliest settled parts of the city. With population pressure and escalating property prices, people had added storeys to their houses without bothering about the firmness of the structure.

All was well till the earthquake hit the city with a vengeance. After the earthquake, Khwaja Mohalla looked like a war zone. Encompassing an area just under three-quarters of a square kilometre, the devastation was so severe that 100 percent of the structures in some streets had been damaged beyond repair; the rest were no longer structurally sound and needed to be demolished.

At places, the streets were choked with rubble as high as 20 feet. Water supply and sewerage lines were blocked; people found it impossible to move from street to street. There was an exodus from the area. When people returned, it was only to retrieve the dead bodies of their near and dear ones or to search for valuables in the rubble of their homes.

The Muzaffarabad Municipal Committee (MMC) prioritised the Mohalla for clearing rubble. The International Organisation for Migration concentrated its efforts on the area and cleared all streets. The MCM also cleared an area designated for garbage dumping and offered the site to the principal of the City Public School, a school serving the Mohalla, to resume its operations. "We jumped at the opportunity and opened our school here so that children could return to their studies rather than staying at home," says Farkhanda, the Principal of the school.

Today, civic amenities have been restored to the area and the MCM, through its debris clearing project, is working swiftly to clear rubble from individual houses. "The alleys are so narrow that we cannot bring any machinery here," says Mushtaq Mohammad, Municipal Engineer. "...Labourers are using shovels to dig the rubble, and wheelbarrows and push carts to remove it."

The contractors working with the MCM are trying to retrieve everything they can from the houses they demolish. Inch by inch, the Mohallah is taking the shape of a residential area once again. "Life is returning to our Mohalla slowly but surely," says Dr Khwaja Ansar, a medical practitioner in the Mohalla. "Very soon, it will be a normal place. That is how life goes on."

² A *bazaar* is a marketplace.

³ A *mohalla* is a locality.



Acronyms and abbreviations

AJK	Azad Jammu and Kashmir
ERRA	Earthquake Reconstruction and rehabilitation Authority
IOM	International Organisation for Migration
JICA	Japan International Cooperation Agency
MCM	Municipal Corporation of Muzaffarabad
MMC	Muzaffarabad Municipal Committee
NATO	North Atlantic Treaty Organization
NWFP	North West Frontier Province
PERRA	Provincial Earthquake Reconstruction and Rehabilitation Agency
PKR	Pakistani rupees
PWD	Public Works Department
SERRA	State Earthquake Reconstruction and Rehabilitation Agency

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During April and September 2007, consultation and interaction took place among the organisers, consultants/communication experts and the participants of two workshops. These communication workshops provided a platform for learning communication skills, sharing information, and critically reviewing material to be used in writing this case study.

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